

# ECONOMIC SURVEY 2025-26



सत्यमेव जयते  
Government of India





# **Economic Survey 2025-26**

Government of India  
Ministry of Finance  
Department of Economic Affairs  
Economic Division  
Kartavya Bhavan-1  
New Delhi-110001  
January, 2026



# CONTENTS

<i>vii</i>	<i>Preface</i>
<i>xvii</i>	<i>Acknowledgement</i>
<i>xix</i>	<i>Abbreviations</i>
<i>xxxvii</i>	<i>List of Tables</i>
<i>xxxix</i>	<i>List of Charts</i>
<i>xlvii</i>	<i>List of Boxes</i>

<b>Chapter No.</b>	<b>Page No.</b>	<b>Name of the Chapter</b>
1		<b>STATE OF THE ECONOMY: PUSHING THE GROWTH FRONTIER</b>
	2	Global Economic Growth – Fragile and Diverging
	8	Trends in the Domestic Economy
	24	Assessment of Domestic Macroeconomic Fundamentals
	30	Outlook and Way Forward
2		<b>FISCAL DEVELOPMENTS: ANCHORING STABILITY THROUGH CREDIBLE CONSOLIDATION</b>
	38	Introduction
	39	Central Government Finances
	57	Overview of State Government Finances
	69	Debt Profile of the Government
	73	General Government Finances
	77	Conclusion and Outlook
3		<b>MONETARY MANAGEMENT AND FINANCIAL INTERMEDIATION: REFINING THE REGULATORY TOUCH</b>
	79	Introduction
	80	Global Financial Markets – Uncertainty and Other Emerging Risks
	87	Monetary Developments
	90	Financial Intermediation
	140	Conclusion
4		<b>EXTERNAL SECTOR: PLAYING THE LONG GAME</b>
	145	Introduction
	146	Global Trade Dynamics
	152	Trends in India's Trade Performance
	172	India's Balance of Payments
	200	Conclusion and Outlook
5		<b>INFLATION: TAMED AND ANCHORED</b>
	204	Global Inflation Developments
	207	Domestic Inflation

215	GDP Deflators: Manufacturing's Reversal in Terms of Trade
217	Inflation: Regional Picture
218	State-Level Dynamics
222	Outlook for Inflation
6	<b>AGRICULTURE AND FOOD MANAGEMENT: RAISING PRODUCTIVITY, SECURING INCOME AND ENSURING</b>
226	Introduction
227	Overview of Agricultural and Allied Sector Performance
233	Drivers of Productivity Improvement: Policy and Institutional Interventions
246	Price and Income Support
253	Food Management
255	Conclusion
7	<b>SERVICES: FROM STABILITY TO NEW FRONTIERS</b>
259	Introduction
260	Global Services Trends and India's Experience
264	Recent Trends in India's Service Sector Performance
276	Sub-Sectoral Performance and Drivers
290	Conclusion and Way forward
8	<b>INDUSTRY'S NEXT LEAP: STRUCTURAL TRANSFORMATION AND GLOBAL INTEGRATION</b>
293	Global Manufacturing: Uneven Recovery and the Shift Towards High-tech Value Chains
295	Domestic developments: Resilience and Structural Transformation
299	Core Input Industries
311	Key Initiatives to Promote Manufacturing
325	Scaling up MSMEs: Deepening Competitiveness, Expanding Market Access, and Bridging the Credit Gap
334	Conclusion: A Roadmap for the Next Leap
9	<b>INVESTMENT AND INFRASTRUCTURE: STRENGTHENING CONNECTIVITY, CAPACITY AND COMPETITIVENESS</b>
342	Enhancing Infrastructure Financing and Private Participation
347	Core Physical Infrastructure
359	Energy Sector
366	Future-ready Digital Infrastructure
370	Social and Emerging Sector Infrastructure
375	Conclusion
10	<b>ENVIRONMENT AND CLIMATE CHANGE: BUILDING A RESILIENT, COMPETITIVE AND DEVELOPMENT-DRIVEN INDIA</b>
377	Introduction
383	Adaptation: Strengthening climate resilience
389	Mitigation: Transition to a low-carbon economy
401	Climate Finance

	410	Regulation: Streamlining environmental governance for growth
	415	Conclusion: Towards a green, resilient and competitive India
11		<b>EDUCATION AND HEALTH: WHAT WORKS AND WHAT'S NEXT</b>
	419	Introduction
	420	Education: Enhancing Quality and Access
	442	Health: Strengthening Public and Preventive Healthcare
	466	Outlook
12		<b>EMPLOYMENT AND SKILL DEVELOPMENT: GETTING SKILLING RIGHT</b>
	467	Introduction
	469	Employment Overview
	485	Catalysing Job Growth
	493	Skill Ecosystem Overview
	497	Skilling Strategies for Youth
	511	Outlook
13		<b>RURAL DEVELOPMENT AND SOCIAL PROGRESS: FROM PARTICIPATION TO PARTNERSHIP</b>
	513	Introduction
	514	Lifting Millions Up: Progress on Poverty and Inequality
	519	Transforming the Rural Economy
	541	Social Justice as an Enabler of Inclusion
	546	Outlook
14		<b>EVOLUTION OF THE AI ECOSYSTEM IN INDIA: THE WAY FORWARD</b>
	549	Artificial Intelligence in India's Economic Context
	559	A Development-oriented Approach to AI
	568	Human Capital for AI
	572	Governance, Institutional Architecture, and Data
	580	AI Safety and Risks
	583	A Phased Roadmap for India's AI Future
15		<b>URBANISATION: MAKING INDIA'S CITIES WORK FOR ITS CITIZENS</b>
	588	Introduction
	597	Governance deficit: When cities lack economic agency
	599	Land, Housing, Mobility, and Sanitation and Waste Management: The Binding Constraints
	612	Informality as an Urban Outcome: from Eradication to Integration
	615	Civic Order without a Social Contract: The Invisible Fault Line in Indian Cities
	624	Non-tangible Aspects of Future Cities

16 part-1	<b>FROM IMPORT SUBSTITUTION TO STRATEGIC RESILIENCE AND STRATEGIC INDISPENSABILITY</b>
636	Swadeshi is inevitable and necessary
639	A Tiered Framework for Strategic Indigenisation
640	A New National Input Cost Reduction Strategy
641	Advanced Manufacturing as a Disciplining System: Why Manufacturing Shapes Institutions
644	The Common Thread: The Entrepreneurial State
645	From Swadeshi to Strategic Resilience to Strategic Indispensability
16 part-2	<b>BUILDING STRATEGIC RESILIENCE AND STRATEGIC INDISPENSABILITY: THE ROLE OF THE STATE, THE PRIVATE SECTOR AND THE CITIZENS</b>
653	Why is State Capacity the Binding Constraint Today?
665	State Capability as a Human System: Culture, Skills, and Execution
668	The Regulatory State as a Core Component of State Capacity
672	The Private Corporate Sector and Nation-Building
676	Citizens, norms, and the Social Foundations of Capability
680	Deregulation – Institutional Capability in Action

# Preface

## Expectations and the reality of 2025

The year 2025 may have begun with one set of expectations and ended with another for the world, India included. However, one notable continuity has been India's strong macroeconomic performance, evident in the post-Covid period. Growth was strong in the first quarter and continued to improve in the subsequent two quarters. The central bank cut interest rates aggressively and loosened liquidity conditions. Macroprudential measures put in place in 2023 were relaxed since the underlying conditions had changed. The government announced significant tax breaks for households in the budget for fiscal year 2026 (FY26) in February. It achieved a fiscal deficit of 4.8% of GDP, against the budgeted 4.9%, and announced a target of 4.4% for FY26, fulfilling the promise made in 2021 to reduce the Union fiscal deficit by more than half from 9.2% in FY21. India received credit rating upgrades from three credit rating agencies in 2025, starting with Morningstar DBRS in May, followed by S&P in August and R&I in September. S&P's upgrade of India from BBB- to BBB was India's first credit rating upgrade from a major agency in nearly two decades.

Although the President of the United States announced reciprocal tariffs of 25% on India in April, India was expected to strike an early agreement with the US administration and lower them. So, in August, when the American President announced an additional penal tariff of 25% on most of India's merchandise exports to the United States on top of the reciprocal tariff of 25% announced in April, it surprised many since India was expected to be one of the early winners in the new tariff regime of the United States. Growth forecasts were revised downward. But in reality, growth accelerated due to a slew of structural reforms and policy measures.

The government passed the most radical overhaul of the Goods and Services Tax since its inception in 2017. Budget announcements on opening up nuclear power generation to the private sector and the insurance sector to 100% foreign direct investment were implemented. The four labour codes were notified, and rules are expected to be in place in the next few months. The Ministry of Environment and Forests relaxed green cover norms for industries based on their polluting potential from the uniform 33% mandate. Indiscriminate Quality Control Orders, which adversely affected downstream industries, were put on hold. A sense of dynamism has taken hold in the government. Fast forward five months, and India is now anticipating a full-year real growth rate of over 7%, with another year of real growth at or near 7%. There is one wrinkle in the ointment, however.

The paradox of 2025 is that India's strongest macroeconomic performance in decades has collided with a global system that no longer rewards macroeconomic success with currency stability, capital inflows, or strategic insulation.

## A victim of geopolitics and a strategic power gap

The Indian rupee underperformed in 2025. India runs a trade deficit in goods. Its net trade surplus in services and remittances is not enough to offset it. India depends on foreign capital flows to maintain a healthy balance of payments. When they run drier, rupee stability becomes a casualty.

Growth is good; the outlook remains favourable; inflation is contained; rainfall and agricultural prospects are supportive; external liabilities are low; banks are healthy; liquidity conditions are comfortable; credit growth is respectable; corporate balance sheets are strong; and the overall flow of funds to the commercial sector is robust. Policy dynamism and purposeful governance reinforce this backdrop. The rupee's valuation does not accurately reflect India's stellar economic fundamentals. In other words, the rupee, therefore, is punching below its weight. Of course, it does not hurt to have an undervalued rupee in these times, as it offsets to some extent the impact of higher American tariffs on Indian goods, and there is no threat of higher inflation from higher-priced crude oil imports now. However, it does cause investors to pause. Investor reluctance to commit to India warrants examination.

The Australia-based Lowy Institute's Power Gap Index suggests that India is operating below its full strategic potential. India's power gap score is -4.0, the lowest in Asia, excluding Russia and North Korea. India has its work cut out.

It is a country of 145 crore people aspiring to become a richer country within a generation, within a democratic framework. India's size and democracy preclude the possibility of templates worthy of emulation. With the global dominant power rethinking its economic and other commitments and priorities, throwing global trade into a welter of uncertainty and global frictions mounting and faultlines widening, India's economic ambitions are confronting powerful global headwinds. Those same forces can be turned into tailwinds if the State, the private sector, and households are willing to align, adapt, and commit to the scale of effort that the moment demands. The task will be neither simple nor comfortable — but it is unavoidable.

### **Three Global Scenarios for 2026**

Although global growth and trade have held up better than expected, few are certain why this is the case. Hence, there is a lingering concern that the negative effects of the ongoing global political and economic turmoil may manifest with a lag. Fragility, uncertainty and episodic shocks are increasingly structural features of the system, and the balance of risks has shifted perceptibly over the past year. Geopolitical competition has intensified, the security environment in Europe has become increasingly complex, and financial vulnerabilities associated with leveraged technology investments are looming. Trade policy is now shaped primarily by security and political considerations rather than efficiency or multilateral rules. Taken together, these developments suggest a world that is less coordinated, more risk-averse, and more exposed to non-linear outcomes with a narrower margin of safety.

Financial markets are already pricing this fragility. Gold rose from USD 2607 to USD 4315 per ounce in 2025<sup>1</sup>, reflecting a weakening US dollar, expectations of persistently negative real rates, and the market's growing assessment of geopolitical and financial tail risks.

The best-case scenario for the world in 2026 is 'business as in 2025', but one that becomes increasingly less secure and more fragile. In this setting, with the margin of safety being thinner, minor shocks can escalate into larger reverberations. Financial stress episodes, trade frictions, and geopolitical escalations do not lead to systemic collapse, but they do create volatility and require governments to intervene more actively to stabilise expectations. This scenario is less about continuity and more about managed disorder, with countries operating in a world that

---

1 As of 26<sup>th</sup> January 2026, the price of gold per ounce was USD 5101.34.

remains integrated yet increasingly distrustful. One could attach a subjective probability of around 40% to 45% to this scenario unfolding in 2026. Reflecting this is the Global Economic Policy Uncertainty Index<sup>2</sup>, which is near its worst readings of 2020, excluding the sharp spike in April 2025 at the introduction of the reciprocal tariffs. Fear lingers. That brings us to the second scenario.

In this scenario, the probability of a disorderly multipolar breakdown rises materially and cannot be treated as a tail risk. Under this outcome, strategic rivalry intensifies, the Russia–Ukraine conflict remains unresolved in a destabilising form, and collective security arrangements unravel. Trade becomes increasingly explicitly coercive, sanctions and counter-measures proliferate, supply chains are realigned under political pressure, and financial stress events are transmitted across borders with fewer buffers and weaker institutional shock absorbers. In this world, policy becomes more nationalised, and countries face sharper trade-offs between autonomy, growth, and stability. One could attach a probability of around 40% to 45% to this scenario as well.

Let us, for a moment, focus on the possibility that financial stress events are transmitted across borders with fewer buffers in place.

On the eve of Christmas 2025, the Financial Times wrote, *“Tech companies have moved more than \$120bn of data centre spending off their balance sheets using special purpose vehicles funded by Wall Street investors, adding to concerns about the financial risks of their huge bet on artificial intelligence.”* The CEO of IBM openly questioned the economics of Large Language Models (LLM)-based AI, reinforcing concerns about the financial risks of this huge bet. Given the leverage involved, a correction could have cascading effects across financial markets and the real economy. The sharp rise in the yields of Japanese Government Bonds is another warning sign.

This leads us directly to the third scenario, with a residual probability of 10%-20%, involving the risk of a systemic shock cascade in which financial, technological, and geopolitical stresses amplify one another rather than unfolding independently. The recent phase of highly leveraged AI-infrastructure investment has exposed business models that are dependent on optimistic execution timelines, narrow customer concentration, and long-duration capital commitments. A correction in this segment would not end technological adoption, but it could tighten financial conditions, trigger risk aversion and spill over into broader capital markets. If such developments were to coincide with geopolitical escalation or trade disruption, the resulting interaction could produce a sharper contraction in liquidity, a sudden weakening of capital flows, and a shift toward defensive economic responses across regions. While this remains a lower-probability scenario, its consequences would be significantly asymmetric. The macroeconomic consequences could be worse than those of the 2008 global financial crisis.

### **Running a marathon and sprint at the same time**

In all three scenarios, India is relatively better off than most other countries due to its strong macroeconomic fundamentals, but this does not guarantee insulation. The country benefits from a large domestic market, a less financialised growth model, strong foreign exchange reserves

---

2 <https://fred.stlouisfed.org/series/GEPUCURRENT> (as of 4th December 2025)

and a credible degree of strategic autonomy. These features provide buffers in an environment where financial volatility is imminent and geopolitical uncertainty is permanent.

At the same time, the three scenarios pose a common risk for India: disruption of capital flows and the consequent impact on the rupee. Only the degree and the duration will vary. In a world of geopolitical turbulence, this may not be confined to a year but could be a more enduring feature. In response, India needs to generate sufficient investor interest and export earnings in foreign currency to cover its rising import bill, as, regardless of the success of indigenisation efforts, rising imports will invariably accompany rising incomes. This has been the historical global experience.

Economic policy must focus on the stability of supply, the creation of resource buffers, and the diversification of routes and payment systems. 2026 may mark the point at which policy credibility, predictability and administrative discipline cease to be mere virtues and instead become strategic assets in their own right, with lasting relevance. The appropriate stance for 2026 is therefore one of strategic sobriety rather than defensive pessimism. The external environment will require India to prioritise both domestic growth maximisation and shock absorption, with a greater emphasis on buffers, redundancy, and liquidity. Put differently, India must run a marathon and sprint simultaneously, or run a marathon as if it were a sprint.

## **Economic Survey Reconfigured**

In its own way, this Economic Survey itself reflects the weight of the momentous changes happening elsewhere. First, this edition of the Economic Survey has seen its depth and breadth deepen and expand, respectively. It has seventeen chapters, and they have been rearranged. The arrangement of chapters, which previously relied on precedence, is now based on the depth and time-relevance of national priorities. Second, the Survey is longer this time than before, due to the range of issues and topics covered. Third, the Survey examines three topics of medium- to long-term interest to us in special essays: the evolution of Artificial Intelligence, the challenge of quality of life in Indian cities, and the roles of state capacity and the private sector (including households) in achieving strategic resilience and strategic indispensability.

To whet your appetite, I discuss below some of the key issues covered in the various chapters of the Survey.

## **Managing the General Government Deficit**

The chapter on fiscal developments deals more extensively with state finances than usual, as concerns over fiscal populism, the crowding out of capital expenditure by cash transfers, and the rise of revenue deficits in states have increased in recent times. The chapter emphasises that India's fiscal credibility today rests on a deliberate shift toward capital formation and human capital investment, facilitated by strong revenue mobilisation and expenditure quality reforms. While the Centre has achieved consolidation alongside record public investment, rising revenue deficits and unconditional cash transfers in several States pose emerging risks by crowding out growth-enhancing spending. With Indian government bonds now globally indexed and investors increasingly assessing general-government finances, weak fiscal discipline at the State level can no longer be treated as locally contained—it increasingly affects the cost of sovereign borrowing. India's 10-year bond yield is 6.7%, while Indonesia's is 6.3%, even though both

countries have the same credit rating of BBB. States' fiscal priorities, perhaps, are casting a shadow on the sovereign's borrowing cost, as investors focus on the fiscal parameters of the general government rather than just those of the Union government. More importantly, the economic costs of the insidious impact that unconditional fiscal transfers have on the incentives for self-improvement, upskilling, and employability may be more significant in the long term.

### **The Cost of Capital and External Deficit**

The chapter 'Monetary Management and Financial Intermediation' makes a deeper claim about why capital remains expensive in India. Beyond the usual proximate explanations, such as policy rates, bank spreads, or inflation, the Survey argues that India's high cost of capital is a structural macroeconomic outcome. A country that persistently runs current-account deficits and depends on foreign savings must, by definition, pay a risk premium to global capital. By contrast, economies that generate sustained external surpluses—through exports, productivity and financial depth—can finance investment cheaply and stably at home. India's long-run challenge, therefore, is not merely to manage liquidity or credit cycles, but to transform itself into a surplus-generating economy. Only then can its cost of capital fall durably.

For competitive businesses, the cost of capital is not the only input cost to consider. Energy is as important, if not more so. Indian businesses grapple with inverted input costs, whether in freight or electricity tariffs. 'Net Zero' transition has the potential to exacerbate this inversion. A recent documentary<sup>3</sup> on Britain's industrial landscape is useful in this regard. That is why the chapter on environment and climate change argues for sequencing, system readiness and finance reforms to deliver a green, competitive growth path without compromising energy security or development objectives.

### **Surplus in Services Trade matters... up to a point**

The chapter, 'External Sector', examines India's balance of payments, the determinants of currency strength or weakness, and the returns to FDI in India, reiterating the importance of pursuing Global Value Chains to establish their ecosystem in India. Currency strength, in general, or currency stability during crises, has always eluded countries that could not become successful and significant exporters of manufactured goods. Countries with strong, stable currencies are known for their manufacturing excellence. India's export performance since the start of the millennium tells its own story. In general, services exports have outpaced goods exports. In particular, over the five years since 2020, the compounded annual growth rate of total exports has been 9.4%, while that of merchandise exports has been only 6.4%. Services have done much of the heavy lifting, creditable and macro-stabilising, but not a substitute for the goods-based export ecosystems that ultimately underpin durable external and currency stability.

The Information Technology-Enabled Services Sector has been India's mainstay for growth and exports since the dawn of the millennium. International experience indicates that while service exports are economically valuable, they do not systematically compel broad upgrades in state capacity, as successful firms can bypass weak institutions, relocate easily, and generate limited economy-wide pressure on governments to reform. Unlike

3 See <https://www.youtube.com/watch?v=PQ3hT8tqZgo&t=19s>

manufacturing exports, they do not impose hard fiscal, employment, or logistical constraints on the State, allowing institutional weakness to persist even alongside globally competitive firms. So, manufacturing matters.

India's recent trade agreements are proof that we have taken note of this. A significant development in this regard is the recently concluded free trade agreement with the European Union after three years of negotiations, which will now require ratification by the European Parliament. In the current global context, the agreement expands market access for India's labour-intensive manufactured exports while enabling deeper integration with Europe's technological and manufacturing capabilities. The FTA with Europe can support the continent's efforts to revitalise parts of its manufacturing base and, at the same time, strengthen India's manufacturing competitiveness, export resilience and strategic capacity. Realising the potential of trade agreements requires that we can produce competitively.

### **Getting Industrial Policy Right**

Manufacturing competitiveness and exports are important for maintaining long-term currency stability and strength. Moreover, when the security of supply of essential and infrastructure goods is no longer assured, manufacturing takes on a far greater strategic dimension. This creates a strategic need for resilience, which must, however, be balanced against the risk that high protection in upstream sectors (for example, textile fibre, steel and aluminium) raises costs for a much larger set of firms engaged in export-oriented production. Upstream industrialisation succeeds only when disciplined by global competition; protection that insulates it instead functions as a tax on downstream manufacturing and export performance. In that sense, decisions about what not to protect can be as important as decisions about what to support. That is what the East Asian experience, starting with Japan, reminds us of. Accordingly, the chapter on 'Industry's Next Leap' argues that competitiveness will hinge on innovation, skilling, infrastructure/logistics and MSME scaling to embed India as a high-productivity manufacturing hub.

Where upstream inputs are costly and capital-intensive, lowering their cost of capital is a more efficient way to support them than raising import protection, because it preserves downstream export competitiveness. That logic becomes unavoidable in a world where global manufacturing is anchored in China's scale and integrated industrial systems, which effectively determine the international cost and technology frontiers that no national tariff wall can override. However, a lower cost of capital does not accrue easily to countries that are structurally savings-deficient (i.e., run current account deficits) and face enduring political incentives for fiscally accommodative policies. As a result, capital remains relatively expensive, and upstream producers find it more challenging to expand their scale or invest in efficiency; hence, they seek the lazier alternative of negotiated shelter. Yet without such expansion and efficiency gains, exports do not grow sufficiently to ease the current account constraint, and the underlying savings imbalance persists. The effort to correct one weakness thus creates another — a reminder of the endogeneity of macroeconomic outcomes.

The exogenous factor is the government, with its ability to frame laws, set rules, raise or lower taxes and tariffs, provide and price utilities, grant approvals and licenses within a reasonable timeframe and incentivise indigenisation without sacrificing efficiency and engendering competitiveness.

Against this backdrop, the principal strategic risk for India is less about any single external shock and more about a mindset that downplays structural discontinuities. Avoiding this risk is possible.

## **The Entrepreneurial State and more**

First, we need to re-imagine state capacity in all its dimensions. To borrow Mariana Mazzucato's phrase, the state machinery needs to become an entrepreneurial state. The phrase, 'an entrepreneurial state', should not be misunderstood. It does not imply the commercialisation of the state, such as state capitalism, nor does it suggest a privileging of private interests. Rather, it refers to a deeper shift towards entrepreneurial policymaking under uncertainty: a state that can act before certainty emerges, structures risk rather than avoids it, learns systematically from experimentation, and corrects course without paralysis. This is not an abstract aspiration.

India has already begun to see elements of this approach in practice: from the creation of mission-mode platforms in semiconductors and green hydrogen, to the restructuring of public procurement to enable first-of-a-kind domestic innovation, and to state-level deregulation compacts that replace inspection-based control with trust-based compliance. These are early signals of what an entrepreneurial state looks like when it moves from compliance to capability.

Second, there is a need for a deeper system-level institutional capacity, including a capable state and a private sector that understands that this phase of India's rise is not merely commercial but also geopolitical in its implications. Recent Economic Surveys have articulated a single, coherent architecture for India's next phase of growth: multiple compacts linking the Union, the states, the private sector, academia and citizens, combined with deep and sustained deregulation. These are not separate themes but mutually reinforcing elements of a system in which the state sets direction, markets allocate effort, and society provides legitimacy. The state alone cannot pull the chariot of economic and social progress. The chapter on Education and Health focuses on the roles of the private sector and citizens in managing obesity, non-communicable diseases, and digital addiction, and on stronger education–skills–industry linkages to build a future-ready workforce.

India's structural transformation, currently underpinned by sustained growth and a broadly stable macroeconomic framework, provides the basis for translating our economic size and momentum into strategic influence. In an uncertain and contested world, an entrepreneurial state and industry that can think beyond itself are needed to sustain and succeed in that endeavour. For starters, it means the large private corporate sector eschewing the habit of seeking negotiated shelter, particularly at the expense of downstream small and medium enterprises, being open to import competition and becoming externally competitive.

The final chapter (in two parts) of this Economic Survey brings together these three elements – state capacity, the society, and deregulation – in the pursuit of Viksit Bharat and global influence. A strong and stable currency would be a natural corollary of that.

Ultimately, in a democracy, the state is the agency empowered to deliver and entrusted with the responsibility for development. For it to deliver on that goal, it must upskill and reskill and be mentally prepared to play a different game because the terrain is different and even hostile, the old rules no longer apply, and new rules are not yet in place. There is no other

choice. A possible eruption of multiple global crises, which presents an opportunity for India to play a meaningful role in shaping the global order that emerges, necessitates the most agile, flexible, and purposeful governance that India has ever been called upon to muster since its Independence.

Drawing on Michael Beckley’s work on national power, this Survey frames power as the product of productive force, institutional quality, and strategic concentration. India has indeed achieved a good deal on the first two elements, and it is equally true that much remains to be done. Historic transition moments such as these carry a subtler danger: that institutions mistake procedure for purpose. Joseph Heller’s metaphor of a “*Catch-22*” captured how systems, once built to ensure safety and order, can end up entrapping those they are meant to serve—where every rule is followed, yet the outcome grows steadily more irrational. In a world of compounding shocks and geopolitical strain, India’s challenge is not merely to design better policies, but to ensure that rules, incentives and administrative reflexes serve national resilience.

Policy reforms do matter. Process reforms arguably more so. Processes define the interaction between the government and the governed. So, they make all the difference to the success or failure of policy intent and reforms. The signs are very promising. The deregulation and smart regulation initiatives undertaken by states in the last year, in particular, provide ample grounds for optimism that the state machinery is capable of reinventing itself and its mission, shifting from regulation and control to enabling. Together with the Union Government’s economic reforms and other policy initiatives, this signals that the state understands the significance of the challenge and the need to rise to it.

### **Upgrading India’s potential growth**

The first chapter on the ‘State of the Economy’ brings us back full circle to the present and the near term. The economy retains momentum, and growth is likely to be sustained into FY27. The chapter also introduces our nowcasting model, which integrates high-frequency indicators to assess growth in the ongoing and subsequent quarters. After three years of operational use and validation, the model has matured into a reliable tool for monitoring near-term macroeconomic conditions in real time.

Accordingly, the Survey now revises India’s potential growth rate to 7.0 per cent, up from 6.5 per cent three years ago. At that time, we correctly anticipated weaker global tailwinds, particularly from exports, but also noted that sustained domestic reforms and public investment could lift the economy’s underlying growth capacity. That possibility is now being realised. The expansion of infrastructure — illustrated by the doubling of the airport network over the past decade and the rapid growth of freight movement through inland waterways — is easing logistics constraints and raising economy-wide efficiency.

At the same time, while headline inflation continues to reflect volatility in food prices, the subdued trajectory of core inflation (excluding gold and silver) indicates a strengthening of supply-side conditions across the economy, consistent with rising productive capacity and improved logistics. In parallel, sustained state-level deregulation efforts are enabling small

and medium enterprises to expand and integrate more effectively into formal value chains, elevating the economy's medium-term growth potential.

श्रेयश्च प्रेयश्च मनुष्यमेतस्तौ सम्परीत्य विविनक्ति धीरः।

श्रेयो हि धीरोऽभि प्रेयसो वृणीते प्रेयो मन्दो योगक्षेमाद्वृणीते॥

Yama's message in the Katha Upanishad is timeless: every moment asks us to choose between Śreya, the enduring good, and Preya, the fleeting comfort. The mature mind chooses Śreya; the immature mind settles for Preya. In other words, the country stands to gain immensely when all of us embrace delayed gratification.

The global environment is being reshaped by geopolitical realignments that will influence investment, supply chains and growth prospects for years to come. Against today's global churn, India must choose to build resilience, innovate relentlessly, and stay the course toward Viksit Bharat, rather than seek quick fixes to visible, short-term pressures.

The good news is that, on balance, the evidence presented in this Survey shows that India will choose well.

It is time to step aside and let you dive into the Economic Survey. I hope you enjoy reading it and find the contents both enriching and enlightening. There are countless people to thank for the product in your hands. All errors are mine.

**V. Anantha Nageswaran**

Chief Economic Advisor

Government of India

January 29, 2026



# Acknowledgment

Consistent with tradition, the Economic Survey 2025-26 is a product of team endeavour. Hon'ble Finance Minister Smt. Nirmala Sitharaman's suggestions early in the process, insights and perspectives prompted deeper reflection and enriched the exercise profoundly. The Survey extends sincere gratitude to the Hon'ble Minister of State for Finance Shri Pankaj Chaudhary, the Cabinet Secretary Shri T.V. Somanathan, Secretary (Expenditure) Shri V. Vualnam, Secretary (DEA) Ms. Anuradha Thakur, Secretary (Revenue) Shri Arvind Shrivastava, Secretary (DIPAM) Dr. Arunish Chawla, and Secretary (Financial Services) Shri M. Nagaraju for their steadfast support.

Contributors to the Survey from core-team encompass the Economic Division and Office of the CEA, and include: Chandni Raina, Anuradha Guru, Chanchal C. Sarkar, Rose Mary K. Abraham, Kokila Jayaram, Aditi Pathak, Deepika Srivastava, Gurvinder Kaur, Arun C. Adatte, Mira Sethi, Prachi Singhal, Venkat Hariharan Asha, Shruti Singh, Gargi Rao, Ritika Bansal, Monika Mangla, Pradyut Kumar Pyne, Pavit, Vishnu K. Venugopal, Manish M. Gade, Vishal Gori, Manju, Rajesh Sharma, Mritunjay Kumar, Amit Kumar Kesarwani, Deepdyuti Sarkar, Rohit Kumar Tiwari, Ajay Ojha, Nikhil Anand, Aman, Sonali Chowdhry, Bharadwaj Adiraju, Meera Unnikrishnan, Akash Poojari, Surabhi Seth, Ritesh Kumar Gupta, Muna Sah, Brijpal, Shweta, Saloni Chhaparia, Siddharth Singh, Suyash Kumar Jha, Allen George Jose and personal staff of the officers. Their dedication and perseverance, often burning the midnight oil, radiate throughout the chapters.

In addition, the initiative benefited from the active involvement of several officials in the Department of Economic Affairs: Kapil Patidar, Syed Zubair Naqvi, Imtiyaz Ahmad, Tulsipriya Rajkumari, Aparajita Tripathi, Yash Laddha, Aarti Garg, Ram Pravesh Kumar, Sonam Choudhry, and Snehil Shandilya.

Apart from the above, various ministries, departments and organisations of the Government of India collaborated in their respective sectors, these include: Anna Roy, Piyush Srivastava, Anuja Bapat, Kusum Mishra, Aman Sharma, Reetu Jain, Preeti Nath, Sudha Kesari, C. Vanlalramsanga, Indrani Kaushal, A. Srija, Bijaya Kumar Behera, Sonia Pant, Lalsanglur, J. Rajesh Kumar, Nila Mohanan, Saju K.S., Kamkhenthang Guite, Rajasree Ray, Sangeeta Saxena, Manik Chandra Pandit, Shakil Alam, Yogesh Suri, Rajiv Mishra, Antony Cyriac, Puneet Bhatia, Seema Jain, Saurabh Diddi, Rajeev Kewani, Surjith Karthikeyan, Anusree Raha, Ram Singh, Sadhana Srivastava, Brijesh Kumar Patel, Chandradeep Kumar Jha, Alpana Vats, Pawan Sharma, Akhilesh Sharma, Kumar Sundaram, Shikha Singh, Neeraj Kumar, Jyoti, Naveen Kumar, Depender Rathore, Ravi Yadav, Shambhu Kumar Singh, Vikash Kumar, Virendra Sharma, P.K. Abdul Kareem, Anurag Sharma, Shubham Bachhal, P. Sangeeth Kumar, Shefali Dhingra, Manoj Kumar Singla, K.M. Krishnan, Yogita Swaroop, Sanjeev, Chandramani Sharma, Atul Kumar Sharma, Asvendra Gupta, Pankaj Yadav, Manoj Mehra, Natasha, Santosh Sinha, Bharat Chandra Rout, Deeksha Supyaal Bisht, Isha Khosla, Rahul Chaurasia, Mahesh Kumar, Sanjay Kumar, Sukhdeep Singh, Manvendra S. Rathod, Kaustubh Rajput, Abhishek Acharya, Unmana Sarangi, Lipika Roy, Sutanuka Sarkar, Swathi S. Senan, Rahul Bhatia, Rashmi Shitole, Reetika Gupta, Sita Ram Meena, Rimjhim T. Desai, Prathibha A., Shashi Ranjan Verma, Utpal Nath, V. Raghunath, Madhu S. Nair, N. Kalaiselvi, Rohit Kumar, K.S.Rejimon, Shoyabahmed

Kalal, Amrit Pal Kaur, Anu Verma, Khushboo Meena, Digambar Swain, Manash Kumar Roy, Sweta Satya, Rishi Kant, Manish Sharma, N. C. Mathew, Manish Bindal, Baidhar Swain, and Santosh Kumar. Views and comments from the State governments of Meghalaya, Odisha, Tamil Nadu, and Kerala significantly enhanced the Survey. We also acknowledge with thanks B.V.R. Subrahmanyam and his team at NITI Aayog for their valuable support in AI-assisted data analytics and visualisations for the Economic Survey.

Various industry bodies, public institutions and private sector entities, including SEBI, RBI, IBBI, IFSCA, GIFT CITY, PFRDA, IRDAI, DGCIS, SIDBI, ISB, IFC, NIPFP, NASSCOM, C-DOT, Artha Global, Good Business Lab, Ei-Educational Initiatives, participated in the process. Furthermore, we are thankful for the constructive discussions with M.S. Sahoo, Nandan Nilekani, Subroto Bagchi, Tirthankar Patnaik, Mirik Gogri, Bahram Vakil, Abdur Rub, Rahul Ahluwalia, Yuvraj Khetan, C. Veeramani, Prerna Prabhakar, Laveesh Bhandari, Harsh Kumar Bhanwala, M. Moni, Maithreyi Ratan, Arun Gupta, Suchita Dutta, Shobhit Mathur, Rukmini Banerji, Sridhar Rajagopalan, Neha Garg, Devi Prasad Mishra, Anirudh Srivatsa, Arunabha Ghosh, Parameswaran Iyer, Richard Damania, Ashish Verma, Aswathy Dilip, Shalabh Goel, Niranjan Rajadhyaksha, Prachi Mishra, Rahul Bajoria, Sajjid Z. Chinoy, Devesh Kapur, N. R. Bhanumurthy, Digvijay Singh Negi, M. Rahul, Shankar Maruwada, M. Vidyasagar, Swami Manohar, Rahul Matthan, Pratyush Kumar, Kamyra Chandra, Lalitesh Katragadda, and Jigar Halani, for offering their in-depth sectoral insights.

Able administrative support was given by Manoj Sahay, Aparna Bhatia, Jasbir Singh, Susruta Samanta, Ajay Kumar Singh, Daleep Kumar, Pankaj Kumar, Davendra Kumar, Rahul Goyal and other staff members of the DEA.

Hindi translation of the survey is credited to the tireless efforts of Pushpalata, Manoj Kumar Thakur, Harish Singh Rawat, Anupam Arya, Samta Rani from Hindi Section, DEA and Rekha Sharma, Gautam Sharma, Sachin Kumar Gupta, Manoj Kumar, Ranjita Shaw, Raveesh Ranjan, Ravishankar Meena, Poonam Verma, and Manish Bhatnagar from the Central Translation Bureau. The Hindi version of the survey was typed by Paljar Lepcha, Santosh Gusain from the Directorate of Printing, Minto Road.

The immaculate page setting of the English and Hindi versions of the Survey was done by Izzur Rahman, Deepak Aggarwal, Divyansh Chhaunkar, Adit Agrawal and Neeru from Signature Printers. The cover page was ideated in-house and designed by Izzur Rahman.

We thank the Government of India Press, Minto Road, for delivering the printed copies of this Economic Survey amidst pressing deadlines. Last but not least, the Economic Survey expresses its profuse thanks to the loved ones of all those involved. This survey would not have been possible without their encouragement and patience.

**V. Anantha Nageswaran**

Chief Economic Adviser

Ministry of Finance

Government of India

# Abbreviations

AAGR	Average Annual Growth Rate
AAI	Airports Authority of India
AAM	Advanced Air Mobility
AAT	Advanced Automotive Technology
AAY	Antyodaya Anna Yojana
AB PM-JAY	Ayushman Bharat Pradhan Mantri Jan Aarogya Yojana
ABDM	Ayushman Bharat Digital Mission
ABM	Agent-Based Modelling
ABR	average billing rate
ACC	Advanced Chemistry Cell
ACoS	average cost of supply
ACS-ARR	Average Cost of Supply – Average Revenue Realised
ADB	Asian Development Bank
AEs	Advanced Economies
AGR	Adjusted Gross Revenue
AHIDF	Animal Husbandry Infrastructure Development Fund
AI	Artificial Insemination
AI	Artificial Intelligence
AI	Already Implemented
AICTE	All India Council for Technical Education
AIDIS	All India Debt and Investment Survey
AIF	Alternative Investment Fund
AIIB	Asian Infrastructure and Investment Bank
AIIMS	All India Institute of Medical Sciences
AIMC	Automated Intelligent Machine-aided Construction
AISHE	All-India Survey on Higher Education
AMI	Agriculture Marketing Infrastructure
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
ANM	Auxiliary Nurse Midwife
ANRF	Anusandhan National Research Foundation
APAAR	Automated Permanent Academic Account Registry
API	Active Pharmaceutical Ingredient
APL	Above Poverty Line
APMC	Agriculture Price Marketing Committee
APY	Atal Pension Yojana
ARIMAX	Autoregressive Integrated Moving Average with Exogenous inputs
ASER	Annual Status of Education Report
ASHA	Accredited Social Health Activist
ASI	Annual Survey of Industries
ASICS	Annual Survey of India's City Systems

ASISSE	Annual Survey of Incorporated Service Sector Enterprises
ASPI	Australian Strategic Policy Institute
ASUSE	Annual Survey of Unincorporated Sector Enterprises
AT&C	Aggregate Technical and Commercial (Losses)
ATMP	Assembly, Testing, Marking and Packaging
ATP	Automatic Train Protection
AUM	Assets Under Management
AVYAY	Atal Vayo Abhyuday Yojana
AWC	Anganwadi Centre
AWW	Anganwadi worker
AYUSH	Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy
BASF	Badische Anilin- und Soda-Fabrik
BAU	Business As Usual
BCD	Basic Customs Duty
BE	Budget Estimates
BESS	Battery Energy Storage System
BIS	Bank of International Settlements
BoJ	Bank of Japan
BoP	Balance of Payments
BOT	Build Operate Transfer
BPKP	Bhartiya Prakritik Krishi Paddhati
BPL	Below Poverty Line
BRAP	Business Reform Action Plan
BRSR	Business Responsibility and Sustainability Reporting
BRTS	Bus Rapid Transit System
BTS	Base Transceiver Station
CAB	Current Account Balance
CACP	Commission for Agriculture Costs and Prices
CAD	Current Account Deficit
CAG	Comptroller and Auditor General of India
CAGR	Compound Annual Growth Rate
CAM	Credit Assessment Model
CAPI	Computer-Assisted Personal Interviewing
CAU	Central Agricultural University
CBAM	Carbon Border Adjustment Mechanism
CBDD	Challenge-Based Destination Development
CBG	Compressed Bio-gas
CBSE	Central Board of Secondary Education
CCCs	Carbon Credit Certificates
CCI	Competition Commission of India
CCPA	Central Consumer Protection Authority
CCTS	Carbon Credit Trading Scheme

CCUS	Carbon Capture, Utilisation, and Storage
C-DAC	Centre for Development of Advanced Computing
CDP	Crop Diversification Programme
CEA	Central Electricity Authority
CEEW	Council on Energy, Environment and Water
CEFC	Common Engineering Facility Centre
CEMS	Continuous Emissions Monitoring Systems
CEO	Chief Executive Officer
CEPA	Comprehensive Economic Partnership Agreement
CERC	Central Electricity Regulatory Commission
CETA	Comprehensive Economic And Trade Agreement
CGA	Controller General of Accounts
CGTMSE	Credit Guarantee Fund Trust for Micro and Small Enterprises
CHCs	Custom Hiring Centres
CIC	Central Information Commission
CIRP	Corporate Insolvency Resolution Process
CLNDA	Civil Liability for Nuclear Damage Act
CLU	Change in Land Use
CMDA	Chennai Metropolitan Development Authority
CoE	Centre of Excellence
COI	Complexity Outlook Index
COP	Conference of the Parties
CORS	Continuously Operating Reference Station
COVID-19	Coronavirus Disease 2019
CPCB	Central Pollution Control Board
CPI	Consumer Price Index
CPR	Common Property Resources
CPSE	Central Public Sector Enterprises
CRAMS	Contract Research And Manufacturing Services
CRAR	Capital-To-Risk-Weighted-Asset Ratio
CRIS	Centre for Railway Information Systems
CRISPR	Clustered Regularly Interspaced Short Palindromic Repeats
CRP	Community Resource Person
CRR	Cash Reserve Ratio
CS	Central Sector
CSE	Centre for Science and Environment
CSS	Centrally Sponsored Scheme
CSS	Code on Social Security 2020
CTE	Consent to Establish
CTF	Clean Technology Fund
CTO	Consent to Operate
CWC	Central Water Commission

CWS	Current Weekly Status
CwSN	Children with special needs
CY	Calendar Year
DAESI	Diploma in Agricultural Extension Services for Input Dealers
DA-JGUA	Dharti Aaba Janjatiya Gram Utkarsh Abhiyan
DAM	Digital Agriculture Mission
DAY-NRLM	Deendayal Antyodaya Yojana – National Rural Livelihoods Mission
DBFOT	Design Build Finance Operate Transfer
DBT	Direct Benefit Transfer
DCCO	Date of Commencement of Commercial Operations
DCR	Development control regulations
DDUGJY	Deen Dayal Upadhyaya Gram Jyoti Yojana
DEGURBA	Degree of Urbanisation
DFC	Dedicated Freight Corridor
DFI	Doubling Farmers' Income
DFM	Dynamic Factor Model
DiD	Difference-in-Differences
DIETs	District Institute of Education & Training
DIIIs	Domestic Institutional Investors
DIKSHA	Digital Infrastructure for Knowledge Sharing
DILRMP	Digital India Land Records Modernisation Programme
DISCOM	Distribution Company
DIY	Do It Yourself
DLC	Digital Life Certification
DMF	District Mineral Fund
DoCA	Department of Consumers Affairs
DPDP	Digital Personal Data Protection
DPI	Digital Public Infrastructure
DPIIT	Department for Promotion of Industry and Internal Trade
DPR	Detailed Project Report
DWER	Debt-Weighted Exchange Rate
ECCE	Early Childhood Care and Education
ECI	Economic Complexity Index
ECMS	Electronics Component Manufacturing Scheme
EFTA	European Free Trade Association
EIA	Environmental Impact Assessment
EMC	Electronics Manufacturing Clusters
EMDEs	Emerging Market and Developing Economies
e-NAM	e-National Agriculture Market
e-NWR	Electronic Negotiable Warehouse Receipt
EPA	Environment Protection Act
EPC	Engineering, Procurement and Construction

EPF	Employees' Provident Fund
EPFO	Employees' Provident Fund Organisation
EPM	Export Promotion Mission
EPR	Extended Producer Responsibility
EPU	Economic Policy Uncertainty
ERP	Enterprise Resource Planning
ESCCerts	Energy Saving Certificates
ESG	Environmental, Social, and Governance
ESIC	Employees' State Insurance Corporation
ETC	Extension Training Centres
ETS	Emissions Trading Systems
EU	European Union
EV	Electric Vehicle
EWA	Earned Wage Access
EYS	Expected years of schooling
FAE	First Advance Estimates
FAO	Food and Agriculture Organization
FAR	Fully Accessible Route
FCA	Foreign Currency Assets
FCI	Food Corporation of India
FCSS	Foreign Currency Settlement System
FDI	Foreign Direct Investment
FER	Foreign Exchange Reserves
FHTC	Functional Household Tap Connection
FI	Financial Inclusion
FIDF	Fisheries Infrastructure Development Fund
FLFPR	Female Labour Force Participation Rate
FLN	Foundational literacy and numeracy
FMD	Foot and Mouth Disease
FMIS	Financial Management Information System
FNHW	Food, Nutrition, Health and WASH
FOIA	Freedom of Information Law
FOIS	Freight Operating Information System
FOPL	Front-of-Pack labelling
FPC	Farmer-Producer Companies
FPI	Foreign Portfolio Investment
FPOs	Farmer Producer Organisation
FPSs	Fair Price Shops
FRBM	Fiscal Responsibility and Budget Management
FRF	Fiscal response function
FRI	Financial Fraud Risk Indicator
FSI	Floor space index

FSR	Financial Stability Report
FSSAI	Food Safety and Standards Authority of India
FTA	Free Trade Agreement
FTA	Free-Trade Agreement
FTE	Fixed Term Employment
FTP	Free Trade Port
FY	Financial Year
GCC	Global Capability Centre
GDP	Gross Domestic Product
GEI	Greenhouse Gas Emission Intensity
GenAI	Generative Artificial Intelligence
GENIUS Act	Guiding and Establishing National Innovation for U.S. Stablecoins Act
GEPU	Global Economic Policy Uncertainty
GER	Gross enrolment ratio
GFCE	Government Final Consumption Expenditure
GFCF	Gross Fixed Capital Formation
GFCI	Global Financial Centres Index
GIFT City	Gujarat International Finance Tec-City
GII	Global Innovation Index
GIS	Geographic Information System
GJ/ton	Gigajoules per ton
GLC	Ground Level Credit
GNPA	Gross Non-Performing Asset
GP	Gram Panchayat
GPDP	Gram Panchayat Development Plans
GPI	Gender Parity Index
GPT	Generative Pre-trained Transformer
GPU	Graphics Processing Unit(s)
GrAM	Gramin Agricultural Markets
GRIT	Gujarat State Institution for Transformation
GSDP	Gross State Domestic Product
G-sec	Government securities
GSLV	Geosynchronous Satellite Launch Vehicle
GST	Goods and Services Tax
GSTN	Goods and Services Tax Network
GT	Gross Tonnage
GTPA	Global Trade Policy Activity
GVA	Gross Value Added
GVC	Global Value Chain
GVO	Gross Value Output
GW	Gigawatt
GWH	Gigawatt-Hours

HAC	heteroskedasticity and autocorrelation-consistent
HAM	Hybrid Annuity Model
HCES	Household Consumption Expenditure Survey
HDI	Human Development Index
HEI	Higher Education Institutions
HFI/HFIs	High-Frequency Indicator(s)
HFSS	High-fat, sugar and salt
HIC	High-Income Countries
HML	Harmonised Master List
HQ	Hannan-Quinn Criterion
HRA	House Rent Allowance
HSC	High-Speed Corridor
HWB	Hedonic well-being
IBC/Code	Insolvency and Bankruptcy Code, 2016
IBM	International Business Machines
IBP	Indo-Bangladesh Protocol Route
ICDR	Indian Counterfeited Device Restriction
ICMR-NIN	Indian Council of Medical Research - National Institute of Nutrition
ICRIER	Indian Council for Research on International Relations
ICT	Information and communication technologies
IDP	Investment Development Path
IDS	Inverted duty structure
IEA	International Energy Agency
IES	India Energy Stack
IFC	International Finance Corporation
IFSCA	International Financial Services Centres Authority
IGFRI	Indian Grassland and Fodder Research Institute
IGIDR	Indira Gandhi Institute of Development Research
IILB	India Industrial Land Bank
IIM	Indian Institute of Management
IIP	Index of Industrial Production
IIPDF	India Infrastructure Project Development Fund
IIT	Indian Institute of Technology
ILO	International Labour Organization
IMC	Indore Municipal Corporation
IMF	International Monetary Fund
IMO	International Maritime Organization
IMR	Infant Mortality Rate
INR	Indian Rupee
IN-SPACe	Indian National Space Promotion and Authorisation Centre
InvIT	Infrastructure Investment Trust
IoT	Internet of Things

IP	Intellectual Property
IPCC	Intergovernmental Panel on Climate Change
IPDS	Integrated Power Development Scheme
IPOs	Initial Public Offers
IRDAI	Insurance Regulatory and Development Authority of India
IREDA	Indian Renewable Energy Development Agency Limited
IRENA	International Renewable Energy Agency
ISAM	Integrated Scheme for Agricultural Marketing
ISB	Indian School Of Business
ISEC	Institute for Social and Economic Change
ISM	India Semiconductor Mission
ISRO	Indian Space Research Organisation
I-STEM	Indian Science Technology and Engineering
IT	Information Technology
ITA	International Tourist Arrival
IT-BPM	Information Technology–Business Process Management
ITC	Input tax credit
ITEES	Institute of Technical Education - Education Services
ITeS	Information Technology Enabled Services
ITI	Industrial Training Institutes
IT-ITeS	Information Technology and IT-enabled Services
IWT	Inland Water Transport
JIT	Just-in-time
JJM	Jal Jeevan Mission
JMVP	Jal Marg Vikas Project
JPC	Joint Plant Committee
KABIL	Khanij Bidesh India Ltd
KCC	Kisan Credit Cards
KERA	Kerala Climate Resilient Agri-Value Chain Modernisation Project
KGBV	Kasturba Gandhi Balika Vidyalayas
KLEMS	Kapital, Labour, Energy, Materials and Service inputs
KMRL	Kochi Metro Rail Limited
KMS	Kharif Marketing Season
KRP	Kisan Rin Portal
KSEB	Kerala State Electricity Board
KVK	Krishi Vigyan Kendra
KW	Kilowatt
KWM	Kochi Water Metro
KY	Krishinnotati Yojana
LAD	Least Available Depth
LAF	Liquidity Adjustment Facility
LEADS	Logistics Ease Across Different States

LEO	Low Earth Orbit
LFPR	Labour Force Participation Rate
LG	Lucky-Goldstar (LG Corporation)
LIC	Lower-income country
LiFE	Lifestyle for Environment
LME	London Metal Exchange
LMIC	Lower-middle-income country
LMT	Lakh Metric Tonnes
LPS	Late Payment Surcharge
LSDG	Localised Sustainable Development Goals
LVM3	Launch Vehicle Mark-3
M&E	Monitoring and Evaluation
MAHSR	Mumbai–Ahmedabad High Speed Rail
MCA	Model Concession Agreement
MDBs	Multilateral Development Banks
MDF	Maritime Development Fund
MegARISE	Protection of Vulnerable Catchment Areas in Meghalaya Project
MeitY	Ministry of Electronics and Information Technology
MERITE	Multidisciplinary Education and Research Improvement in Technical Education
MFIs	Microfinance Institutions
MFP	Minor Forest Produce
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MIDH	Mission for Integrated Development of Horticulture
MIIs	Market Infrastructure Institutions
MISHTI	Mangrove Initiative for Shoreline Habitats & Tangible Incomes
MISS	Modified Interest Subvention Scheme
MIT	Massachusetts Institute of Technology
MITI	Ministry of International Trade and Industry (Japan)
MITRA	Maharashtra Institution for Transformation
MM	Money Multiplier
MMF	Man-Made Fibres
MMT	Million Metric Tonnes
MoHFW	Ministry of Health & Family Welfare
MoHUA	Ministry of Housing and Urban Affairs
MoPR	Ministry of Panchayati Raj
MoSPI	Ministry of Statistics and Programme Implementation
MOVCDNER	Mission Organic Value Chain Development for North Eastern Region
MPC	Monetary Policy Committee
MPCE	Monthly Per Capita Expenditure
MPI	Multidimensional Poverty Index
MRA	Mutual Recognition Agreement
MRO	Maintenance, Repair, and Overhaul

MSDE	Ministry of Skill Development and Entrepreneurship
MSF	Marginal Standing Facility
MSME	Micro, Small and Medium Enterprise
MSP	Minimum Support Price
MSW	Municipal Solid Waste
MTPA	Million Tonnes Per Annum
MUDRA	Micro Units Development & Refinance Agency.
MW	Megawatt
MWH	Megawatt-Hours
n.e.c.	Not Elsewhere Classified
NABARD	National Bank for Agriculture and Rural Development
NAMASTE	National Action for Mechanised Sanitation Ecosystem
NAPCC	National Action Plan on Climate Change
NAPS	National Apprenticeship Promotion Scheme
NAS	National Accounts Statistics
NAS	National Achievement Surveys
NASA	National Aeronautics and Space Administration
NASSCOM	National Association of Software and Service Companies
NATS	National Apprenticeship Training Scheme
NavIC	Navigation with Indian Constellation
NBC	Net borrowing ceiling
NBCs	Nucleus Breeding Centres
NBER	National Bureau of Economic Research
NBFC	Non-Banking Financial Company
NCD	Non-communicable Diseases
NCERT	National Council of Educational Research and Training
NCIP	National Crop Insurance Portal
NCLT	National Company Law Tribunal
NCMM	National Critical Mineral Mission
NCR	National Capital Region
NCrF	National Credit Framework
NCS	National Career Service
NCTE	National Council for Teacher Education
NDB	New Development Bank
NDC	Nationally Determined Contributions
NDMF	National Disaster Mitigation Fund
NEER	Nominal Effective Exchange Rate
NEP	National Education Policy 2020
NER	Net enrolment ratio
NERCORMP	North Eastern Regional Community Resource Management Programme for Upland Areas
NF	Natural Farming

NFA	Net Fixed Assets
NFAP	National Frequency Allocation Plan
NFC	Non-Food Credit
NFCS	Natural Farming Certification System
NFHS	National Family Health Survey
NFS	NITI for States
NFSA	National Food Security Act
NFSM	National Food Security Mission
NFSNM	National Food Security and Nutrition Mission
NGE	Non-Governmental Entity
NGO	Non-government organisation
NGT	National Green Tribunal
NH	National Highway
NIEI	National Infrastructure Enablement Index
NIIF	National Investment and Infrastructure Fund
NIIP	Net International Investment Position
NIMHANS	National Institute of Mental Health and Neuro-Sciences
NIPUN	National Initiative for Proficiency in Reading with Understanding and Numeracy
NIRD&PR	National Institute of Rural Development and Panchayati Raj
NIRF	National Institutional Ranking Framework
NISAR	NASA–ISRO Synthetic Aperture Radar
NITI	National Institution for Transforming India
NLP	National Logistics Policy
NMAP	National Multi-sectoral Action Plan
NMCG	National Mission for Clean Ganga
NMDFC	National Minorities Development and Finance Corporation
NMEO-OP	National Mission on Edible Oil – Oilpalm
NMEO-OS	National Mission on Edible Oils–Oilseeds
NMHS	National Mental Health Survey
NMM	National Manufacturing Mission
NMNF	National Mission on Natural Farming
NMR	Neonatal Mortality Rate
NNPA	Net Non-Performing Asset
NOCs	No Objection Certificates
NOSUIS	National One Soil Unified Information System
NPA	Non-Performing Asset
NPCI	National Payments Corporation of India
NPNCd	National Programme for Prevention and Control of Non-Communicable Diseases
NPS	National Pension System
NRCD	National River Conservation Directorate
NSA	Non-Standalone (5G architecture)
NSAP	National Social Assistance Programme

NSDC	National Skill Development Corporation
NSDL	National Securities Depository Limited
NSMP	National Soil Mapping Programme
NSQF	National Skills Qualification Framework
NSRC	National Remote Sensing Centre
NSWS	National Single Window System
NTL	Night-time lights
NTTM	National Technical Textile Mission
NUDGE	Non-intrusive Usage of Data to Guide and Enable
NVA	Net Value Added
NW	National Waterway
ODF	Open Defecation Free
ODI	Overseas Direct Investment
ODR	Online Dispute Resolution
ODSA	Odisha Skill Development Authority
OECD	Organisation for Economic Co-operation and Development
OFDI	Outward Foreign Direct Investment
OFS	Offer for Sale
OMO/OMOs	Open Market Operation(s)
ONORC	One Nation One Ration Card
OPEC	Organization of the Petroleum Exporting Countries
OS	Open Source
OSR	Own source revenues
P2P	Peer-to-Peer
PA	Priority Area
PACS	Primary Agricultural Cooperative Societies
PAI	Panchayat Advancement Index
PAIMANA	Project Assessment Infrastructure Monitoring and Analytics for Nation Building
PARAKH	Performance Assessment, Review, and Analysis of Knowledge for Holistic Development
PARIVESH	Pro-Active and Responsive facilitation by Interactive, Virtuous, and Environmental Single Window Hub
PAT	Profit After Tax
PAT	Perform, Achieve and Trade
PBIS	Professional, Business, and Information Services
PDMC	Per Drop More Crop
PDS	Public Distribution System
PE	Provisional Estimate
PFC	Power Finance Corporation Ltd
PFCE	Private Final Consumption Expenditure
PFMS	Public Financial Management System
PFRDA	Pensions Fund Regulatory Authority
PISA	Programme for International Student Assessment

PKVY	Paramparagat Krishi Vikas Yojana
PLFS	Periodic Labour Force Survey
PLI	Production Linked Incentive
PLISFPI	Production Linked Incentive Scheme for Food Processing
PM AJAY	Pradhan Mantri Anusuchit Jaati Abhyuday Yojana
PM JANMAN	Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan
PM POSHAN	PM Poshan Shakti Nirman
PM SHRI	Pradhan Mantri Schools for Rising India
PM SVANidhi	Pradhan Mantri Street Vendor's Atmanirbhar Nidhi
PMAY	Pradhan Mantri Awas Yojana
PMAY-U	Pradhan Mantri Awas Yojana – Urban
PM-DDKY	PM Dhan Dhaanya Krishi Yojana
PMFBY	Pradhan Mantri Fasal Bima Yojana
PMFME	Pradhan Mantri Formalisation of Micro Food Processing Enterprises
PMGKAY	Pradhan Mantri Garib Kalyan Anna Yojana
PMGSY	Pradhan Mantri Gram Sadak Yojana
PMI	Purchasing Managers' Index
PM-JANMAN	Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan
PMJDY	Pradhan Mantri Jan Dhan Yojana
PMJJBY	Pradhan Mantri Jeevan Jyoti Bima Yojana
PMJVM	Pradhan Mantri Janjatiya Vikas Mission
PM-KISAN	Pradhan Mantri Kisan Samman Nidhi
PMKMY	Pradhan Mantri Kisan Maandhan Yojana
PMKSY	Pradhan Mantri Kisan Sampada Yojana
PMKVY	PM Kaushal Vikas Yojana
PM-MITRA	Pradhan Mantri Mega Integrated Textile Region and Apparel
PM-MKSSY	Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana
PMMSY	Pradhan Mantri Matsya Sampada Yojana
PMMVY	Pradhan Mantri Matru Vandana Yojana
PMMY	Pradhan Mantri Mudra Yojana
PMSBY	Pradhan Mantri Suraksha Bima Yojana
PoP	Professor of Practice
PPE	Personal Protective Equipment
PPI	Private Participation in Infrastructure
PPIRP	Pre-Packaged Insolvency Resolution Process
PPP	Public Private Partnerships
PPPAC	Public-Private Partnership Appraisal Committee
PRASHAD	Pilgrimage Rejuvenation and Spiritual Heritage Augmentation Drive
PRAYAAS	Promoting Regular & Assisted Migration for Youth and Skilled Professionals.
PRI	Panchayati Raj Institutions
PSBs	Public Sector Banks
PSP	Pumped Storage Hydropower

PSU	Public Sector Undertaking
PVTG	Particularly Vulnerable Tribal Groups
QBUSE	Quarterly Bulletin of Unincorporated Sector Enterprises
QCO	Quality Control Order
QE	Quantitative Easing
QPOM	Quick Pontoon Opening Mechanism
R&D	Research And Development
R&I	Rating and Investment Information, Inc.
RBI	Reserve Bank of India
RCA	Radio Corporation of America
RDI	Research, Development and Innovation
RDIF	Research, Development & Innovation Fund
RDSS	Revamped Distribution Sector Scheme
RE	Renewable Energy
RE	Regulated Entities
REC	Rural Electrification Corporation Ltd
RECSS	Rural Economic Conditions and Sentiments Survey
REIT	Real Estate Investment Trust
RERA	Real Estate (Regulation and Development) Act
RF	Radio Frequency
RfP	Request for Proposal
RfQ	Request for Qualification
RGSA	Rashtriya Gram Swaraj Abhiyan
RIE	Research, Innovation and Enterprise
RKVY	Rashtriya Krishi Vikas Yojana
RMS	Rabi Marketing Season
RMSE	Root Mean Squared Error
ROCERS	Remote sensing enabled Online Chemical Emergency Response System
RoE	Return on Equity
RO-PDS	Route Optimisation in the Public Distribution System
RoW	Right of Way
RP	Resolution Professionals
RRBs	Regional Rural Banks
RRTS	Regional Rapid Transit System
RSETIs	Rural Self-Employment Training Institutes
RSVC	RuTAGe Smart Village Centre
RTI	Right to Information
RuTAGe	Rural Technology Action Group
S&P	Standard & Poor's Ratings
SACFA	Standing Advisory Committee on Radio Frequency Allocations
SAME	Sub-Mission on Agriculture Extension
SAPCC	State Action Plans on Climate Change

SAS	Situation Assessment Survey
SASCI	Special Assistance to States for Capital Investment / Expenditure
SAU	State Agricultural Universities
SAUBHAGYA	Pradhan Mantri Sahaj Bijli Har Ghar Yojana
SBCC	Social & Behaviour Change Communication
SbDS	Shipbuilding Development Scheme
SBFAS	Shipbuilding Financial Assistance Scheme
SBM	Swachh Bharat Mission
SBM-U	Swachh Bharat Mission – Urban
SC	Scheduled Castes
SCADA	Supervisory Control and Data Acquisition
SCBs	Scheduled Commercial Banks
SCERTs	State Council of Educational Research and Training
SCI	Social Connectedness Index
SCM	Smart Cities Mission
SD 2.0	Swadesh Darshan 2.0
SDF	Standing Deposit Facility
SDG	Sustainable Development Goals
SDL	State development loans
SDMF	State Disaster Mitigation Fund
SEBI	Securities and Exchange Board of India
SECC	Socio Economic and Caste Census
SERC	State Electricity Regulatory Commission
SETU	State Institute for Empowering and Transforming Uttarakhand
SEZs	Special Economic Zones
SHANTI	Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India
SHC	Soil Health Card
SHGs	Self Help Groups
SHM	Soil Health Management
SHUT	Service for Healthy Use of Technology
SIAM	Society of Indian Automobile Manufacturers
SIDBI	Small Industries Development Bank of India
SIDH	Skill India Digital Hub
SIF	Specialised Investment Fund
SIRD	State Institutes of Rural Development
SITs	State Institutions for Transformation
SJY	Satat Jeevikoparjan Yojana
SLUS	Soil and Land Use survey
SMAE	Sub-Mission on Agricultural Extension
SMAM	Sub-Mission on Agricultural Mechanisation
SMC	Securities Markets Code

SMDI	Strengthening of Medical Device Industry Scheme
SMEC	Scheme to Promote Manufacturing of Electric Passenger Cars in India
SMSP	Sub-Mission on Seeds and Planting Materials
SNA-SPARSH	Single Nodal Account -Samyochit Pranali Ekikrit Shighra Hastantaran
SPARK	School Programmes in Articulation, Resilience and Kindness
SPCBs	State Pollution Control Boards
SPU	State Public Universities
SPV	Special Purpose Vehicle
SRO	Sub Registration Offices
SROs	Self-Regulatory Organisations
SRR	Seed Replacement Rates
SSC	Sector Skill Councils
SSE	Social Services Expenditure
SSM	State Support Mission
SSW	Septic tank workers
STEAM <sub>3</sub>	Science, Technology, Engineering, Arts, Mathematics, Management, and Medicine
STEM	Science, Technology, Engineering, and Mathematics
STP	Sewage Treatment Plant
STT	Securities Transaction Tax
STW	School-to-work
SUPs	Single-Use Plastics
SUT	Supply and Use Tables
SUUTI	Specified Undertaking of The Unit Trust of India
SVAMITVA	Survey of Villages Abadi and Mapping with Improvised Technology in Village Areas
SVAR	Structural Vector Autoregressive
TAMP	Tariff Authority for Major Ports
TBMS	Train Based Management System(s)
tCO <sub>2e</sub>	Tonnes of CO <sub>2</sub> equivalent
TDS	Tax Deducted at Source
Tele-MANAS	Tele Mental Health Assistance and Networking Across States
TEPA	Trade And Economic Partnership Agreement
TFP	Total Factor Productivity
TIFT	Tripura Institution for Transformation
TMT	Telecommunication, Media and Technology
TOD	Transit-oriented development
TOP	Tomatoes, Onions and Potatoes
TOT	Toll Operate Transfer
ToT	Terms of Trade
TPC	Total Project Cost
TPD	Tonnes Per Day
TPE	Total persons engaged

TPU	Trade Policy Uncertainty
TRCs	Translational Research Centres
TReDS	Trade Receivables Discounting System
TRIPS	Trade-Related Aspects Of Intellectual Property Rights
TRL	Technology Readiness Level
TSA	Treasury Single Account
TTDF	Telecom Technology Development Fund
TUS	Time Use Survey
TUW	Treated used water
TVET	Technical and Vocational Education and Training
U.S.	United States
U5MR	Under-five mortality rate
UAN	Universal Account Number
UCF	Urban Challenge Fund
UCT	Unconditional Cash Transfers
UDAN	Ude Desh ka Aam Nagrik
UDC	Universal Design for Learning
UDID	Unique Disability ID
UDISE	Unified District Information System for Education
UGC	University Grants Commission
UHT	Ultra-High Temperature
UI	Under Implementation
UIDF	Urban Infrastructure Development Fund
UJALA	Unnat Jyoti by Affordable LEDs for All
UK	United Kingdom
ULB	Urban local bodies
ULIP	Unified Logistics Interface Platform
ULLAS	Understanding of Lifelong Learning for All in Society
ULPIN	Unique Land Parcel Identification Number
UMIC	Upper Middle-Income Countries
UMTA	Unified Metropolitan Transport Authority
UNCTAD	United Nations Conference on Trade and Development
UNDESA	United Nations Department of Social and Economic Affairs
UNIDO	United Nations Industrial Development Organization
UNWTO	United Nations World Tourism Organisation
UPF	Ultra-processed Food
UPI	Unified Payments Interface
UPS	Unified Pension Scheme
UR	Unemployment Rate
USA/US	United States of America/United States
USD	United States Dollar
UTs	Union Territories

UWIS	Urban Water Information System
VB-G RAM G	Viksit Bharat–Guarantee for Rozgar and Ajeevika Mission (Gramin)
VBSA	Viksit Bharat Shiksha Adhishthan
VC	Venture Capital
VCSS	Vessal Communication and Support System
VGf	Viability Gap Funding
VISVAS	Vanchit Ikai Samooh Aur Vargon Ko Aarthik Sahayata
VLTS	Vehicle Location Tracking System
VRR	Voluntary Retention Route
WAC	weighted average coupon
WALR	Weighted Average Lending Rate
WAM	Weighted average maturity
WASH	Water, Sanitation and Hygiene
WB	World Bank
WCO	World Customs Organisation.
WDI	World Development Indicators
WEO	World Economic Outlook
WHO	World Health Organisation
WINDS	Weather Information Network and Data System
WIPO	World Intellectual Property Organization
WPI	Wholesale Price Index
WPR	Worker Population Ratio
WTO	World Trade Organisation
WUS	Water User Society
XIV-FC	Fourteenth Finance Commission
XV-FC	Fifteenth Finance Commission
YES-TECH	Yield Estimation System based on Technology
YoY	Year-on-Year

## List of Tables

<b>Table No.</b>	<b>Title</b>	<b>Page No.</b>
Table I.1	Revisions in IMF's Global Growth and Inflation Projections vis-a-vis Jan 25 Forecasts	2
Table I.2a	Demand and Supply Side Drivers of Growth	9
Table I.2b	Sectoral Contribution to GDP	10
Table I.3	Performance of High-Frequency Indicators Indicates Resilient Domestic Demand	12
Table I.4	High-Frequency Indicators Signalling Firming Investment Momentum	13
Table I.5	High-Frequency Indicators Suggest Strengthening of Industrial Activity	17
Table I.6	High-Frequency Indicators Point to a Continuation of Momentum in Service Activity	18
Table I.7	Growth Accounting Assumptions and Implied Growth	34
Table II.1	Trends in the Components of Direct Taxes	41
Table II.2	Trends in Non-tax Revenue of the Centre (in ₹ lakh crore)	48
Table II.3	Key Metrics of CPSE's Performance Over 5 Years	48
Table II.4	Revenue Expenditure	50
Table II.5	Capital Expenditure by the Centre	55
Table II.6	Details of Transfers from Centre to States	57
Table II.7	Disbursement of FC Grants in FY26	57
Table II.8	Total Amount Released to State Governments/UTs Under SASCI	62
Table II.9	Regression Results	76
Table III.1	Impact of Independent Variables on Long-run Interest Rates	126
Table III.2	Progress Card of the Major Financial Operations Performed by GIFT City	132
Table IV.1	Alternative Destinations for India's Exports	160
Table V. 1	Headline Inflation in States /UTs	219
Table VII.1	Performance of Transport Indicators	284
Table VIII.1	Industry-wise Growth in Deployment of Gross Bank Credit	298
Table VIII.2	Growth in Steel Production and Consumption	300
Table VIII.3	Growth in Deployment of Gross Bank Credit to MSMEs	326
Table X.1	Municipal Green Bonds Issues in India	405
Table XI.1	Cross-country Comparison of EYS	421
Table XI.2	Achievement of School Education Programmes	422
Table XI.3	Status of Skilling of Population in the Age Group 14 to 18	433
Table XI.4	Field of Formal Training Opted for by the Population Aged 14 to 18.	433
Table XI.5	Progress in Health Sector Schemes	444
Table XII.1	Features of the Work Relationship	489
Table XIII.1	Key Data Points	529

<b>Table No.</b>	<b>Title</b>	<b>Page No.</b>
Table XIII.2	NRLM: Empowering Rural Communities - From SHGs to Lakhpati Didis	530
Table XIII.3	Key Schemes to Improve Social Justice	542
Table XIV.1	Short-run Dynamics	554
Table XIV.2	Long-run Dynamics	554
Table XV.1	Classification of Cities with Different Population Sizes	588
Table XVI.1	Proposed Conceptual Definitions	645
Table XVI.2	From Import Substitution to Strategic Indispensability: A Comparative Perspective	645
Table XVI.3	Policy Logic and Risk Orientation Across Import Substitution, Strategic Resilience and Strategic Indispensability	646

## List of Charts

<b>Chart No.</b>	<b>Title</b>	<b>Page No.</b>
Chart I.1	Policy Rates in EMDEs	3
Chart I.2	Policy Rates in AEs	3
Chart I.3	Primary Deficits in Major Economies are Higher than Pre-Pandemic Levels	4
Chart I.4	Sovereign 10 yr. Bond Yields of Major Economies Remain Elevated	4
Chart I.5	Global Policy Uncertainty Remains Elevated	5
Chart I.6	Deteriorating Global FDI Flows	5
Chart I.7	Growth in PFCE Highest Since H1 of FY23	11
Chart I.8	Share of PFCE in GDP Shifts to Higher Level	11
Chart I. 9	Growth in GFCF Remains Robust	12
Chart I. 10	GFCF Contribution to GDP Remains Steady	12
Chart I. 11	Export Growth Sustains Above Pre-Pandemic Levels	13
Chart I. 12	Exports Share in GDP Remain Stable Despite Global Headwinds	13
Chart I.13	Agricultural Growth Improves, but Remains Below the Long-Term Average	14
Chart I. 14	Volatile Crop Growth Offset by Stable Expansion in Allied Activities	14
Chart I. 15	Growth in Manufacturing GVA Deflator has Remained Moderate	15
Chart I.16	Share of Manufacturing Remains Stable in Real Terms	15
Chart I. 17	Sectoral Growth in H1:FY26 Higher than Pre-Pandemic Trends	16
Chart I. 18	Sectoral Growth in H1:FY26 Higher than Pre-Pandemic Trends	17
Chart I. 19	Scree Plot and Cumulative Explained Variance Plot Behind the Nowcasting Model	20
Chart I.20	Actual vs Predicted GDP Growth Using Nowcasting Model	20
Chart:I.21	Trends in CPI Inflation Components	24
Chart I.22	Declining Sovereign 10 yr. Yield Spread over U.S. Bonds Indicates Lower Risk Premium	25
Chart I.23	Sectoral Deployment of Credit By SCBs	26
Chart I. 24	Overall Flow of Financial Resources to Commercial Sector in India from Non-Bank Sources	26
Chart I. 25	Current Account Balance Remains Stable	27
Chart I.26	Labour Market Dynamics For H1 FY26	29
Chart II. 1	Trends in Deficit Indicators of the Centre	39
Chart II. 2	Decomposition of the Fiscal Deficit of the Centre	39
Chart II. 3	Gross GST Collections Reach All-Time Highs, Even as the Growth Tracks Nominal GDP Growth	43
Chart II.4a	GST Collection Track Nominal GDP Growth	44

<b>Chart No.</b>	<b>Title</b>	<b>Page No.</b>
Chart II. 4b	E-Way Bill Volumes Indicate Robust Transaction Momentum Under GST	44
Chart II.5	Trends in Effective Capex	54
Chart II. 6	Capex as a Share of Total Expenditure	54
Chart II. 7	Trends in Expenditure of the Centre - April to November	56
Chart II.8	Deficit Indicators Reflect Prudent Fiscal Management- April to November	56
Chart II.9	Deficit Indicators of States	59
Chart II.10	Fiscal Performance Across States	60
Chart II. 11	Trend in Revenue Receipts of States	61
Chart II. 12	Capital Outlay Sourced from the States' Own Resources	63
Chart II. 13	Correlation of Reliance on SASCI With Per Capita GSDP	63
Chart II.14	Composition of States' Total Expenditure	64
Chart II. 15	Quality of Expenditure of States	64
Chart II.16	Performance of States' Receipts During April-November	67
Chart II.17	Decomposing Performance of Own Tax Revenues During April-November	67
Chart II.18	Performance of States' Expenditure During April-November	68
Chart II.19	Decomposing Performance of Revenue Expenditure During April-November	68
Chart II. 20	Deficit Indicators as on end November	69
Chart II. 21	Centre's Debt Trajectory	69
Chart II. 22	Yield Curve of Government Securities	71
Chart II.23	General Government Liabilities to GDP Ratio	73
Chart II. 24	Trends in General Government Gross Debt Across the World	74
Chart II.25	General Government - Investment Allocation from Revenues	77
Chart III.1	Global Equity Market, Gold and Corporate Bond Performance for 2025	81
Chart III.2	Variations in EPU and Model Estimates of Uncertainty	86
Chart III.3	Monetary Developments Reflect Easing Financial Conditions	88
Chart III.4	Trends in the Money Multiplier	89
Chart III.5	Policy Corridor and Call Rate	90
Chart III.6	Trends in GNPA's of SCBs and CRAR	91
Chart III.7	Improvement in Performance Indicators of SCBs	91
Chart III.8	Outstanding Credit of SCBs	92
Chart III.9	Sectoral Deployment of Non-Food Credit of SCBs	93
Chart III.10	Overall Flow of Resources to the Commercial Sector in India	95
Chart III.11	Performance of the RRBs	97
Chart III.12	Trend of Transition Time- Overdue Accounts	111
Chart III.13	Performance of Major World Indices	113

<b>Chart No.</b>	<b>Title</b>	<b>Page No.</b>
Chart III.14	Ownership Trends of Individual Investors	118
Chart III.15	Household Wealth Accretion in Indian Equities	118
Chart III.16	Composition of Financial Assets in FY19 vs FY25	119
Chart III.17	Composition of Annual Financial Savings for Select Products	119
Chart III.18	Trend in Net FPI Investment in Equity and Debt Segments	128
Chart III.19	Spread between 10-Year US and Indian Government Bond Yield	128
Chart III.20	Net Purchases/Sales by FPIs and DIIs	129
chart III.21	Share of DIIs and FIIs by Value OF Holdings	130
Chart III.22	NPS: AUM and Subscribers	133
Chart III.23	APS: AUM and Subscribers	133
Chart III.24	Total Amount of Life and Non-Life Insurance Premiums	137
Chart IV.1	Trends in Nearshoring, Friendshoring and Trade Concentration	148
Chart IV.2	Developments in the Global Trade Policy Activity Index	149
Chart IV.3	Rise in Global Uncertainty	150
Chart IV.4	Growth in Trade Volume (Goods and Services) of AEs and EMDEs	151
Chart IV.5	India's Total (Merchandise and Services) Trade	153
Chart IV.6	India's Merchandise Trade Performance	155
Chart IV.7	Trends in Agricultural Exports	156
Chart IV.8	Trade Performance of the PLI Sectors	158
Chart IV.9	Exports from Labour-Intensive Sectors to the US and India's Total Exports	159
Chart IV.10	India's Service Trade Performance	170
Chart IV.11	Share of Business and Software Service Exports in India's Total Service Exports	171
Chart IV.12	India's Current Account Balance	172
Chart IV.13	Current Account Balance	173
Chart IV.14	Role of Remittance in External Financing	174
Chart IV.15	Trends in Global FDI Flows	175
Chart IV.16	Trends in India's FDI	177
Chart IV.17	Risk-Adjusted Return on Inward FDI	179
Chart IV.18	Share of Developed and Developing Economies in Global OFDI Flows, 2000-2024	183
Chart IV.19	Investment Development Path	184
Chart IV.20	Geographical Composition of India's OFDI	186
Chart IV.21	Net FPI Inflows into India	187
Chart IV.22	Trends in FPI	188
Chart IV.23	Composition of India's Foreign Exchange Reserves	189
Chart IV.24	Exchange Rate Movements in Relation to the Current Account Balance and Net FDI	190
Chart IV.25	CAGR of Merchandise Exports, Services Exports and Total Exports	196

<b>Chart No.</b>	<b>Title</b>	<b>Page No.</b>
Chart IV.26	NIIP - Major Net Creditors and Debtors to the World	198
Chart IV.27	External Debt Position of Top 25 Debtor Countries	199
Chart IV.28	External Debt Position of India	200
Chart V. 1	Global Headline Inflation	204
Chart V.2	Global Food and Oil Inflation Trends in 2025	205
Chart V.3	Key Metals -Inflation Trends in 2025	206
Chart V. 4	Inflation-GDP Trade-Offs for EMDEs in 2025	206
Chart V. 5	Change in Inflation Rate in Major Economies	207
Chart v.6	Average Annual Headline Inflation	208
Chart V.7	Monthly CPI (Headline, Core and Food) Inflation	208
Chart V.8	Decrypting Core Inflation	209
Chart V.9	Base and Momentum Effect	210
Chart V.10	Components – CPI (Vegetables, Pulses & Spices)	211
Chart V.11	Reducing Volatility in Pulses’ Prices	212
Chart V.12	Components – CPI (Meat and Fish, Egg and Milk and Milk Products)	212
Chart V.13	Components - CPI (Tomato, Onion, Potato and Garlic)	213
Chart V.14	Edible Oil Inflation and Basic Customs Duty Imposition	213
Chart V.15	Major Components of Core Inflation	215
Chart V.16	Terms of Trade of Manufacturing Sector with Agriculture and Services: FY05-FY25	216
Chart V.17	Headline Inflation: Rural and Urban	218
Chart V.18	Core Inflation: Rural and Urban	218
Chart V.19	State-Level Inflation Differentials and Persistence	220
Chart V.20	State-Level Inflation Differential and Wage Gap	222
Chart VI.1	Steady Performance of the Agriculture and Allied Sector	227
Chart VI.2	Decadal Performance of the Agricultural Sector	227
Chart VI.3	Performance Of Allied Sectors(GVA at Current Prices)	228
Chart VI.4	Production of Foodgrains and Horticulture	228
Chart VI.5	Annual Average Growth Rate Across Major Agricultural Economies	229
Chart VI.6	Yield Difference Across Major Crops	229
chart VI.7	Yield (Rice)	230
Chart VI.8	Yield (Wheat)	230
Chart VI.9	Region-wise Share in KCC-MISS Accounts, Credit Disbursed, and MISS Benefit Released through KRP for FY 25	242
Chart VI.10	Increase in MSP	247
Chart VI.11	Increased Procurement of Wheat and Paddy	254
Chart VI.12	Food Subsidy	254
Chart VII.1	India’s Services Share in GDP Strengthens in Line with Global Trends	261

<b>Chart No.</b>	<b>Title</b>	<b>Page No.</b>
Chart VII.2	Resilient and Steady: India's Services GVA Growth Outperforms Global Trends Despite Slight Moderation	262
Chart VII.3	Services Trade Underpins India's Growth Resilience	262
Chart VII.4	Services Global FDI: Rising Concentration in Energy and Communication Services Post Pandemic	263
Chart VII.5	Services Sector Continues to be Major Driver of Growth	264
Chart VII.6	Deviation from Pre-Covid Average Growth	265
Chart VII.7a	Services Sector Drives Urban Employment	267
Chart VII.7b	Services Continue to Drive Net Payroll Additions	267
Chart VII.8	Services PMI Expands Higher Than Long Run Average	268
Chart VII.9	Credit to Services Sector	268
Chart VII.10a	Step Up in Services Export Contribution Post Pandemic	269
Chart VII.10b	Services Exports Expand on the Back of Software and Professional Services	269
Chart VII.11a	Sustained Growth in Domestic Travel	277
Chart VII.11b	ITAs Continue to Expand	277
Chart VII.11c	Hotel Occupancy Remains Firm	277
Chart VII.12	Growth of GCCs Ecosystem	280
Chart VII.13	Snapshot of GenAI Startups Landscape	281
Chart VII.14	Increased Household Savings in the Form of Physical Assets	286
Chart VII.15	Average Housing Sales Remain Higher Than FY22-FY24	287
Chart VIII.1	Quarter-On-Quarter Growth in Manufacturing Output for Q3 of 2025	294
Chart VIII.2	Real Industry GVA has Witnessed a Clear Recovery	295
Chart VIII.3	Sustained Momentum in Real Manufacturing GVA Growth	295
Chart VIII.4	India's Seasonally Adjusted Global Exports of Medium- and High-Tech Manufactured Products	296
Chart VIII.5	Optimism About Prospects Continue to Remain High	297
Chart VIII.6	Year-on-Year Growth in Bank Credit to Industry	298
Chart VIII.7	Installed Capacity, Production and Capacity Utilisation of Cement Industry	300
Chart VIII.8	Finished Steel Production, Consumption, Exports and Imports	301
Chart VIII.9	Coal: Domestic Production, Consumption, and Import	302
Chart VIII.10	Coal Production as Per Cent of Domestic Consumption	302
Chart VIII.11	Production of Chemicals and Petro-Chemicals	303
Chart VIII.12	Installed Capacity of Chemicals and Petro-Chemicals	303
Chart VIII.13	Capital Goods: Production, Exports and Imports	304
Chart VIII.14	Production, Sales and Exports of Automobiles	305
Chart VIII.15	Growing EV Registrations	305
Chart VIII.16	Growth of Electronics Production and Exports	306
Chart VIII.17	Growing Exports of the Pharmaceutical Industry	308

<b>Chart No.</b>	<b>Title</b>	<b>Page No.</b>
Chart VIII.18	Trade in Textiles and Apparels	310
Chart VIII.19	Share of Components in India's Textile Exports in FY 25	310
Chart VIII.20	India's Ranking in the Global Innovation Index Over the Years	313
Chart VIII.21	Patent Applications	313
Chart VIII.22	Trademark Registrations	313
Chart VIII.23	Rapid Growth in DPIIT-Recognised Startups	314
Chart VIII.24	R&D Expenditures in Semiconductor Industry as a Percentage of Sales	318
Chart VIII.25	Growth in Terms of Number of QCOs and Coverage	320
Chart VIII.26	Distribution of Establishments by Sources of Loan Outstanding as on Last Date of Reference Period	329
Chart VIII.27	Average Interest Burden Across Different Sources of Finance	330
Chart VIII.28	Distribution of Amount of Loan Outstanding by Sources of Financing	331
Chart VIII.29	Backward GVC Participation – BVAX, India and Vietnam	333
Chart IX.1	Government Capex has Continued to Rise Steadily since FY22	340
Chart IX.2	Deployment of Gross Bank Credit to Infrastructure	342
Chart IX.3	Funds Mobilised by REITs and InvITs	342
Chart IX.4	Increase in Project Approvals by PPPAC	344
Chart IX.5	Total NH Network	348
Chart IX.6	Operational High-Speed Corridors	348
Chart IX.7	Average Annual Construction	348
Chart IX.8	Capital Expenditure on Roads & Highways	348
Chart IX.9	Average Commissioning of Railway Network per year	351
Chart IX.10	Capital Expenditure on Railways	351
Chart IX.11	Air Cargo Handling	353
Chart IX.12	Passenger Traffic at All Airports	353
Chart IX.13	Port Infrastructure Expansion and Record Cargo Performance	355
Chart IX.14	Reduction in Average Container Vessel Turnaround Time	355
Chart IX.15	Capacity Addition in the Power Sector	360
Chart IX.16	Improvement in Daily Average Power Supply	361
Chart IX.17	IES Impact on Stakeholders	363
Chart IX.18	Total Installed RE Capacity: 253.96 GW	366
Chart IX.19	Expansion of Telecom Access	367
Chart IX.20	Expansion of Internet and Broadband Connectivity	367
Chart IX.21	Affordability Driving Surge in Monthly Data Consumption	368
Chart IX.22	Progress in Telecommunication Infrastructure (Bharat Net Progress)	368
Chart IX.23	Status of Tap Water Supply in Rural Homes Under JJM	371
Chart X.1	Evolution of State Action Plans On Climate Change	386
Chart X.2	India's Total Installed Capacity by Source	390

<b>Chart No.</b>	<b>Title</b>	<b>Page No.</b>
Chart X.3	India's Clean Energy Achievements at a Glance	391
Chart X.4	GHG Emission Intensity Target Setting Process	399
Chart X.5	Key Milestones in India's Climate and Sustainable Finance Framework	404
Chart X.6	Mobilisation of Sovereign Green Bonds	405
Chart XI.1	Improvement in School Infrastructure	424
Chart XI.2	Pattern of Grade-Wise Enrolment	424
Chart XI.3	Improvement in Learning Outcomes	430
Chart XI.4	Reason for Not Attending School for Out-Of-School Adolescents	432
Chart XI.5	Improvement in Infrastructure	434
Chart XI.6	Comparative Figures of Inbound Students for BRICS Nations	440
Chart XI.7	State-Wise Progress in IMR Over the Past Decade	443
Chart XI.8	Gender Wise and Area-Wise Share of NCDs, CDS and Others Over the Years	446
Chart XI.9	Gender and Cause-Specific Comparison of Death	447
Chart XI.10	Parallel Rise in Obesity and UPF Consumption in India	448
Chart XI.11	Trend in Average Nutrient Intake	452
Chart XI.12	Convergence of per day per capita Calorie Intake in Urban and Rural Areas	453
Chart XI.13	Suicide Death Rates and Within-District Connectedness	461
Chart XI.14	Inter and Intra-District Connectedness	462
Chart XI.14a	Bihar	462
Chart XI. 14b	Uttar Pradesh	462
Chart XI. 14c	Kerala	462
Chart XI.14d	Tamil Nadu	462
Chart XII.1	Labour Market Dynamics for H1 FY26	470
Chart XII.2	Labour Market Dynamics in H1 FY26: Industry Distribution	470
Chart XII.3	Labour Market Dynamics in H1 FY26: Status	470
Chart XII.4	Time Use Statistics	473
Chart XII.5	Rise in Overall Factory Employment	479
Chart XII.6	Trends in Employment Per Factory	479
Chart XII.7	Emolument and Net Value Added Per Person Engaged	479
Chart XII.8	Employment Trend by Factory Size	480
Chart XII.9	Large Factories Pay Higher Wages	480
Chart XII.10	Large Factories Have Higher Labour Productivity	480
Chart XII.11	Higher Growth in Large Factories	481
Chart XII.12	Eight Major Industry Groups in Terms of Employment	481
Chart XII.13	States with a Higher Share of Large Factories have Higher TPE and Productivity.	482
Chart XII.14	Sector-Wise Distribution of Gig Workforce	490

<b>Chart No.</b>	<b>Title</b>	<b>Page No.</b>
Chart XIII.1	Progress in State-Wise Incidence of Multidimensional Poverty	516
Chart XIII.2	Trends in SSE of the General Government	518
Chart XIII.3	Urban-Rural Gaps in Child Nutrition	538
Chart XIV.1	Use of AI for at least one business function by respondents' organisations, McKinsey	550
Chart XIV. 2	Over 70% of all data centres (by count) are located in High-Income Countries (as of June 2025)	559
Chart XIV. 3	Scenario 1 – Baseline	561
Chart XIV. 4	Scenario 2 – High Foreign Demand for GPUs	562
Chart XIV.5	Scenario 3 – High Domestic Demand with liberal finance availability	563
Chart XIV.6	Startups focused on curating training data are yet to come up at scale in India	564
Chart XIV.7	Open Models have been Consistently Closing the Gap in Performance	567
Chart XIV.8	A Majority of Employers Place a Higher Emphasis on Foundational Skills	570
Chart XV.1	Top 10 Fastest Growing Cities in the World 2019-35	589
Chart XV.2	Evolution of the Rural and Urban Population in India	591
Chart XV.3	Urban Populations – India vs LMICs and LICs	591
Chart XV.4	India Could be Far More Urban	591
Chart XV.5	Un Projections of Urban India	591
Chart XV.6a	NTL Radiance - 2012	592
Chart XV.6b	NTL Radiance - 2023	592
Chart XV.7	Spatial Transformation of Kerala's Settlement Structure	596
Chart XV.8	Municipal Bonds Issuances as on 30th September 2025	598
Chart XV.9	Free Floor Space Index (FSI) Across Cities	600
Chart XV.10	Corridor Capacity of Different Modes of Transportation	602
Chart XV.11	Progress of Garbage-Free City Framework	608
Chart XV.12	Gross Domestic Behaviour Survey Results	617
Chart XVI.1	The QE Infinity Trap	631
Chart XVI.2	Projected Rise in Electricity Consumption by Data Centres	632
Chart XVI.3	Copper Prices Reach Historic Highs Amid Surging Demand	633
Chart XVI.4	From Import Substitution to Strategic Resilience	639
Chart XVI.5	China's Import Growth and Rising Per-Capita Income	648
Chart XVI.6	Priority Areas Across Five Sectors	682
Chart XVI.7	Progress in Implementation	682

## List of Boxes

<b>Box No.</b>	<b>Title</b>	<b>Page No.</b>
Box I.1	The Resurgence of Economic Statecraft and the Imperative of Achieving Strategic Resilience and Indispensability	5
Box I.2	Nowcasting India's Quarterly GDP Growth	18
Box I.3	Strengthening India's National Statistical System: From Data Generation to Data Readiness	21
Box I.4	Reassessing India's Medium-Term Potential Growth	31
Box II.1	Nudging Compliance: How Data-Driven Behavioural Interventions Transformed Tax Collection Efficiency in India	41
Box II.2	Expected Channels of Impact Of GST 2.0 Reforms	44
Box II.3	Cross Subsidies in Railway Traffic and Power Distribution	51
Box II.4	Tech-Driven Solutions for Improving Efficiency in Public Expenditures	52
Box II.5	Fiscal Devolution and Economic Convergence Across States	58
Box II.6	Special Assistance to States For Capital Expenditure/Investment	62
	Unconditional Cash Transfers-Fiscal Trade-Offs and Medium-Term Implications	64
Box II.7		
Box II.8	Fiscal Policy Framework for The Central Government	70
	Is General Government Debt Sustainable: Evidence from a Fiscal Response Function	75
Box II.9		
Box III.1	Capital Formation Amidst Uncertainty Shocks - A Study of Listed Firms In India	83
	Artificial Intelligence in Financial Services: Global Trends And India's Approach.	99
Box III.2		
	Microfinance, Financialisation, and The Need to Re-Centre Household Welfare In Impact Investing	102
Box III.3		
	Micro-Credit as a pathway to financial inclusion: Evidence from PMMY and PM SVANidhi	105
Box III.4		
	Can Payment Infrastructure Improve Overall Financial Deepening?	107
Box III.5		
	Reinventing Market Regulation: Securities Markets Code, 2025	114
Box III.6		
	Evolving Patterns of Household Financial Savings In India	117
Box III.7		
	SEBI's Recent Initiatives: Advancing Regulatory Excellence, Market Growth, and Investor Protection	120
Box III.8		
	What explains the Persistently High Cost of Capital? - an Exploration	124
Box III.9		
	Sabka Bima Sabki Raskha	138
Box III.10		
	Finance for Growth: Paving The Way for Viksit Bharat	142
Box III.11		
	Pharmaceutical Sector's Transformation in The Aftermath of Trips Agreement: Lessons for India Inc.	165
Box IV.1		
	Returns on Inward Foreign Direct Investment	178
Box IV.2		
	India's FDI Challenge: Turning Success Into Sustainable Growth	179
Box IV.3		
	Impact of outward FDI on The Home Country	183
Box IV.4		
	trade and financial channels of the exchange rate	191
Box IV.5		
	Manufactured Exports, Services and Currency Credibility: Lessons From East Asia	194
Box IV.6		

Box VI.1	State Level Innovations in Agricultural Governance leading to outcomes: Some evidence	231
Box VI.2	Ethanol Pricing and Cropping Incentives: Emerging Trade-offs for Food Security	234
Box VI.3	Prime Minister Dhan Dhaanya Krishi Yojana: Envisioning Prosperity	237
Box VI.4	Re-Orienting Fertiliser Use Towards Soil Health and Crop Productivity	238
Box VI.5	Using Procurement Efficiencies to Support Crop Diversification and Farmer Incomes	247
Box VI.6	Transforming Food Subsidy Delivery Through Technology, Targeting, and Transparency.	254
Box VII.1	NITI's Findings on State-Level and Sector-Level Dynamics	265
Box VII.2	Artificial Intelligence and India's Services Exports	270
Box VII.3	India's Trade Agreements and Engagements for 2025 Relevant for Services	271
Box VII.4	Can the Export of Services Help Improve State Capacity?	273
Box VII.5	Servicification of manufacturing - Global evidence and India's emerging trajectory	275
Box VII.6	The Orange Economy - An Emerging Lever for Media, Tourism and Urban Services	288
Box VIII.1	Strategic Policy Interventions for Electric Mobility	305
Box VIII.2	Key Initiatives to Strengthen Electronics Manufacturing	307
Box VIII.3	Key Policy Initiatives in the Pharmaceutical Sector	309
Box VIII.4	National Mission on Manufacturing (NMM)	312
Box VIII.5	CSIR Progress in Applied Innovation	314
Box VIII.6	India's Rankings in Critical Technology Research Output	316
Box VIII.7	Why the India Semiconductor Mission Matters	317
Box VIII.8	Quality Control-Towards Pragmatism	320
Box VIII.9	Why India Must Strengthen its Industrial Cluster Strategy to Compete Globally	323
Box VIII.10	Maharashtra's Pioneering Defence & Aerospace Venture Fund— A State-Led Innovation Finance Model	326
Box VIII.11	Online Dispute Resolution (ODR) For MSMEs: Securing Working Capital	328
Box VIII.12	Strengthening Access to Small-Value Credit— Financing Opportunities for Unincorporated Manufacturing Enterprises	329
Box VIII.13	Backward GVC Participation And Domestic Value Addition: Evidence From India And Vietnam	332
Box VIII.14	Why Advanced Manufacturing Matters for India	334
Box VIII.15	Innovation for Strategic Resilience and Indispensability	335
Box IX.1	Key Institutional Mechanisms to Support PPPs in India	344
Box IX.2	Public–Private Partnerships (PPP)- Strengthening the Partnership Paradigm	346
Box IX.3	Key Initiatives and Reforms in the Roadways & Highways Sector	349
Box IX.4	Key Infrastructure Initiatives in The Railways Sector	351
Box IX.5	Key Policy Initiatives Driving Civil Aviation Growth	353

Box IX.6	Recent Legislative Reforms in Ports And Shipping Sector	355
Box IX.7	Inland Waterways Transformation: Achievements, Key Projects and Initiatives	356
Box IX.8	Urban Water Transport: Kochi Water Metro as a Scalable Model	357
Box IX.9	Shipbuilding: Reforms, Achievements, Key Projects and Initiatives	359
Box IX.10	Reforming The Last Mile - Key Initiatives to Strengthen Discom Finances	361
Box IX.11	Enabling Consumer Agency, Open Innovation, and System Efficiency through India Energy Stack (IES)	362
Box IX.12	Key Developments in India's Telecom Sector	368
Box IX.13	Key Achievements and Initiatives in Water Resource Management	372
Box IX.14	Enhancing Private Participation in the Space Sector	374
Box X.1	Kerala Climate Resilient Agri-Value Chain Modernisation Project (Kera)	385
Box X.2	The Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (Shanti) Act, 2025	392
Box X.3	Renewable Energy Integration in the State of Kerala	394
Box X.4	Material Requirements for Renewable Energy	395
Box X.5	Developments in the International Carbon Markets	399
Box X.6	Transforming Waste into Wealth by Odisha	401
Box X.7	Greenium in Sovereign Green Bond Markets — Cross-Country Comparison and Market Issues	406
Box X.8	Sustainable and Climate Finance — Plenty of Capital, Limited Risk Appetite	408
Box X.9	Do Pollution Trading Schemes Work in Developing Countries?	411
Box X.10	Balancing Growth and Green Initiatives...Some Evidence	414
Box XI.1	Empowering Change in Indian Education through Community Participation	425
Box XI.2	Reimagining School Education: Strengthening Meaningful Assessments and Enhancing Accountability	427
Box XI.3	From Books To Report Cards: Evidence From Learning Surveys	430
Box XI.4	Strengthening School Education for Human Capital and Productivity Growth	432
Box XI.5	Industry-Academia Integration in Stem Education	437
Box XI.6	Promoting International Student Mobility	439
Box XI.7	Addressing the Challenge of Ultra-Processed Foods	448
Box XI.8	Nutrition for A Future Ready India	453
Box XI.9	Leveraging Social & Behaviour Change Communication: Lessons from the Rajasthan Cash Plus Model	456
Box XI.10	Getting By, With A Little Help From Friends	459
Box XII.1	Balancing the Scales: Insights from Time Use Survey 2024	471
Box XII.2	Enhancing Female Labour Force Participation	474
Box XII.3	Building A Resilient and Productive Workforce	483
Box XII.4	Economics of The Labour Codes	486
Box XII.5	Balancing Regulation and Flexibility: The New Frontiers of The Gig Workforce	491

Box XII.6	Making Skilling ‘Work’ For Upskilling and Employability	495
Box XII.7	From Classroom to Career: How Early Vocational Education Can Transform India’s Skilling Landscape	498
Box XII.8	Future-ready workforce through apprenticeships	501
Box XII.9	Strengthening Industrial Training Institutes: Lessons from Odisha’s success	504
Box XII.10	Skill Vouchers: Making Training Systems More Flexible, Fair, And Future-Ready	507
Box XIII.1	VB G-Ram G Bill 2025 - Reforming MGNREGA for Viksit Bharat	521
Box XIII.2	Panchayat Advancement Index: A Composite Tool to Track Local SDG Progress	532
Box XIII.3	Empowering Tribal Communities to Embrace Digital Technologies and Practices	535
Box XIII.4	Communication for Rural Development and Transformation	540
Box XIV.1	Employment in the AI-Salient Period - Evidence From The U.S. Service Sector	551
Box XIV.2	Identifying Bottlenecks To AI Compute Expansion - An Agent Based Model Approach	560
Box XIV.3	Local Ingenuity and Frugal AI in India	566
Box XIV.4	Where Human Value Lies in an AI-Driven Knowledge Economy	571
Box XIV.5	An AI Economic Council For India	574
Box XIV.6	Data as a Strategic Resource — Objectives and Framework Principles	579
Box XV.1	Rethinking urbanisation in India using spatial classification: evidence from Kerala	595
Box XV.2	India’s First Namoo Bharat Regional Rapid Transit System – A Network of Networks	603
Box XV.3	International Experiences and Learnings from Congestion Pricing	606
Box XV.4	Turning India’s Urban Water Stress into an Opportunity Using Circular Water Economy	610
Box XV.5	The concept of contextual compliance	623
Box XVI.1	East Asia – Architecture of State Capacity	643
Box XVI.2	From Resilience to Influence - India’s Power Gap in Asia	647
Box XVI.3	Bureaucratic Integration, The Entrepreneurial State, and Mobilising Culture For Scale in India	657
Box XVI.4	Hysteresis, Policy Reversibility, and the Entrepreneurial State	658
Box XVI.5	The RTI Act: Transparency Without Blindness	660
Box XVI.6	Developed States for Viksit Bharat@2047: Strengthening Cooperative Federalism through State Support Mission	664
Box XVI.7	Regulatory Capacity as Institutional Design	668
Box XVI.8	Profit, Capability and National Purpose: International Precedents	673
Box XVI.9	What Visionary Bureaucracy Can Achieve: India’s Case Experience From “Produce and Protect” To Broad-Based Industry Promotion	685

# STATE OF THE ECONOMY: PUSHING THE GROWTH FRONTIER

*The global economic environment remains uncertain, shaped by geopolitical tensions, trade disruptions, and divergent growth and inflation outcomes across major economies. While global activity has shown resilience in the near term, underlying vulnerabilities persist, including elevated fiscal pressures, fragmented supply chains, and an increased reliance on economic policy instruments for strategic purposes.*

*Against this backdrop, the Indian economy has maintained strong growth momentum in FY26. The First Advance Estimates place real GDP growth at 7.4 per cent, with growth largely driven by domestic demand. Private consumption and capital formation continue to support expansion, while services remain the key contributor on the supply side. Manufacturing activity has strengthened, and agriculture has provided stability, notwithstanding structural constraints.*

*The chapter analyses demand and supply-side developments during the first half of FY26, supported by high-frequency indicators for the third quarter. It highlights the role of consumption and investment in sustaining growth, even as external demand provides incremental support amid challenging global conditions. To supplement official estimates, the chapter also uses high-frequency indicators and an in-house nowcasting framework to assess near-term growth trends.*

*The chapter reviews key macroeconomic fundamentals, including inflation, financial sector conditions, fiscal developments, external sector performance, and labour market trends. Inflation has moderated, financial sector balance sheets remain healthy, and fiscal policy continues to strike a balance between supporting growth and consolidation. The external sector remains manageable, supported by services exports and adequate foreign exchange reserves.*

*Looking ahead, while global uncertainties remain elevated, domestic growth drivers are expected to continue supporting economic activity. With macroeconomic stability in place and ongoing reform efforts, the economy appears well-positioned to sustain growth in the near term. The outlook for FY27 is shaped by these domestic strengths, alongside evolving external conditions. The chapter concludes that India's medium-term growth potential has strengthened to 7 per cent, positioning the economy on a path of steady expansion amid global uncertainty.*

## GLOBAL ECONOMIC GROWTH – FRAGILE AND DIVERGING

1.1. Since the last version of the Economic Survey was published, the global economy has been subjected to multiple upheavals. The most disruptive amongst these disturbances was the imposition of tariffs by the USA on imports from its trade partners. The long promised reciprocal tariffs, announced in April 2025, initially sparked concerns about lower growth and higher inflation in the global economy which have proven to be transient in the short run. This was due to multiple reasons. Trade agreements between the US and certain trading partners have considerably lowered the US's effective tariff rate. According to the IMF's World Economic Outlook (WEO), October 2025, US households and businesses increased their spending ahead of expected tariff hikes. In some instances, delays in tariff implementation allowed businesses to postpone raising prices and frontload their exports. As a result, global economic activity has remained relatively stable in the short term. This is reflected in the IMF's projections of growth and inflation for advanced economies (AEs) and emerging market and developing economies (EMDEs) made at various points in time between January 2025 and January 2026 (Table I.1). Growth in EMDEs for the year 2025 is eventually higher than the levels projected in April 2025, while that in AEs is projected to be better than initially feared, primarily driven by strong growth in the US. For the year 2025, inflation in AEs is expected to have remained stubbornly higher by 40 basis points compared to initial projections, while that in EMDEs is expected to have declined further (Table I.1).

**Table I.1: Revisions in IMF's global growth and inflation projections vis-a-vis Jan '25 forecasts**

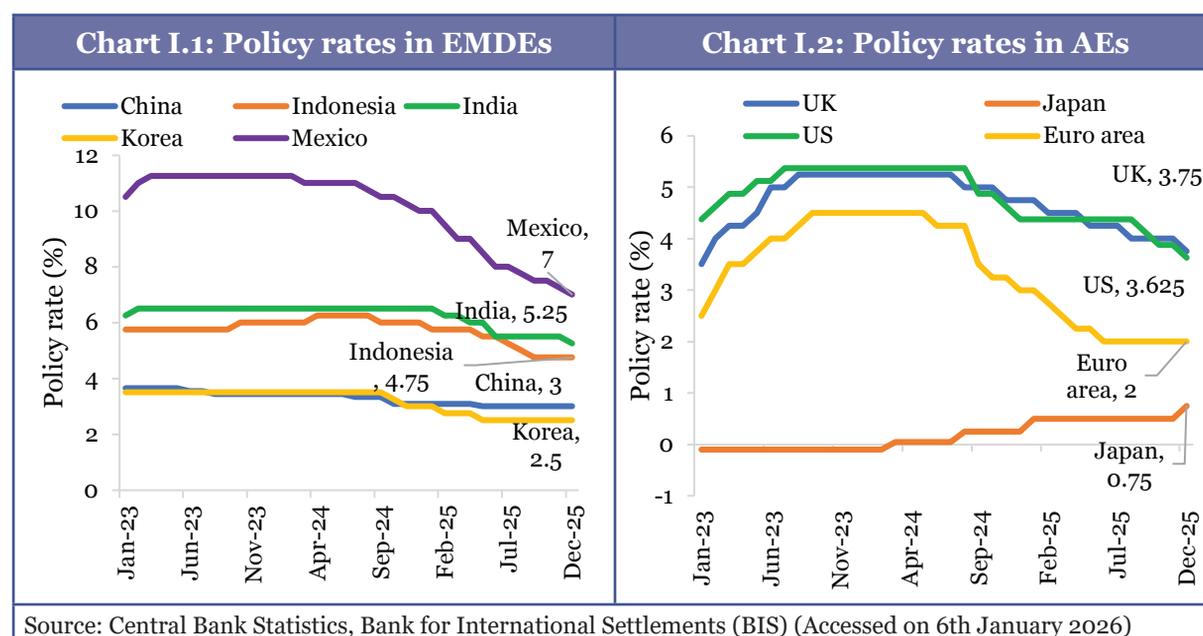
<b>Growth outlook stabilises after Apr '25 downward revisions</b>								
Growth forecasts – 2025 (percent)				Growth forecasts – 2026 (percent)				Growth deviation from Jan '25
	Jan '25	Apr '25	Oct '25	Jan '26	Jan '25	Apr '25	Oct '25	
AE	1.9	1.4	1.6	1.7	1.8	1.5	1.6	1.8
EMDE	4.2	3.7	4.2	4.4	4.3	3.9	4.0	4.2
Global	3.3	2.8	3.2	3.3	3.3	3	3.1	3.3
Growth: Green = upward revision, Red = downward revision								
<b>Inflation expected to remain stubborn in AEs</b>								
Inflation forecasts – 2025 (percent)				Inflation forecasts – 2026 (percent)				Inflation revision over Jan '25
	Jan '25	Apr '25	Oct '25	Jan '26	Jan '25	Apr '25	Oct '25	
AE	2.1	2.5	2.5	2.5	2.0	2.2	2.2	2.2
EMDE	5.6	5.5	5.3	5.2	4.5	4.6	4.7	4.8
Global	4.2	4.3	4.2	4.1	3.5	3.6	3.7	3.8
Inflation: Green = downward revision, Red = upward revision								

Source: IMF World Economic Outlook (WEO) Jan 2025 to Jan 2026  
 Note: The colour coding is based on deviation from the Jan 2025 forecasts.

1.2. These aggregated statistics, however, hide emerging frailties in economic activity

within and across countries. Growth in the US has remained strong, primarily driven by investment in artificial intelligence (AI). Total IT investment, which also includes spending by businesses on equipment and software to facilitate AI use, has accounted for nearly half of GDP growth in recent quarters, helping to mitigate the negative effects of trade tariffs on growth.<sup>1</sup> This strong growth has been accompanied by inflation remaining stubbornly above the 2 per cent target and a rising unemployment rate. While inflation in Europe is broadly trending towards the European Central Bank's target, growth in the region's economies has been mixed. Forecasts by the European Commission<sup>2</sup> indicate that growth rates in Germany, Italy, and France are expected to remain moderate, while Spain is anticipated to outperform. In Asia, the Chinese economy continues to face deflationary pressures amid headwinds stemming from the crisis in its property sector, indicating tepid domestic demand, even as Chinese merchandise exports remain a key driver of its growth. Growth in the Japanese economy remains moderate, while inflation continues to exceed the Bank of Japan's (BOJ) target of 2 per cent.

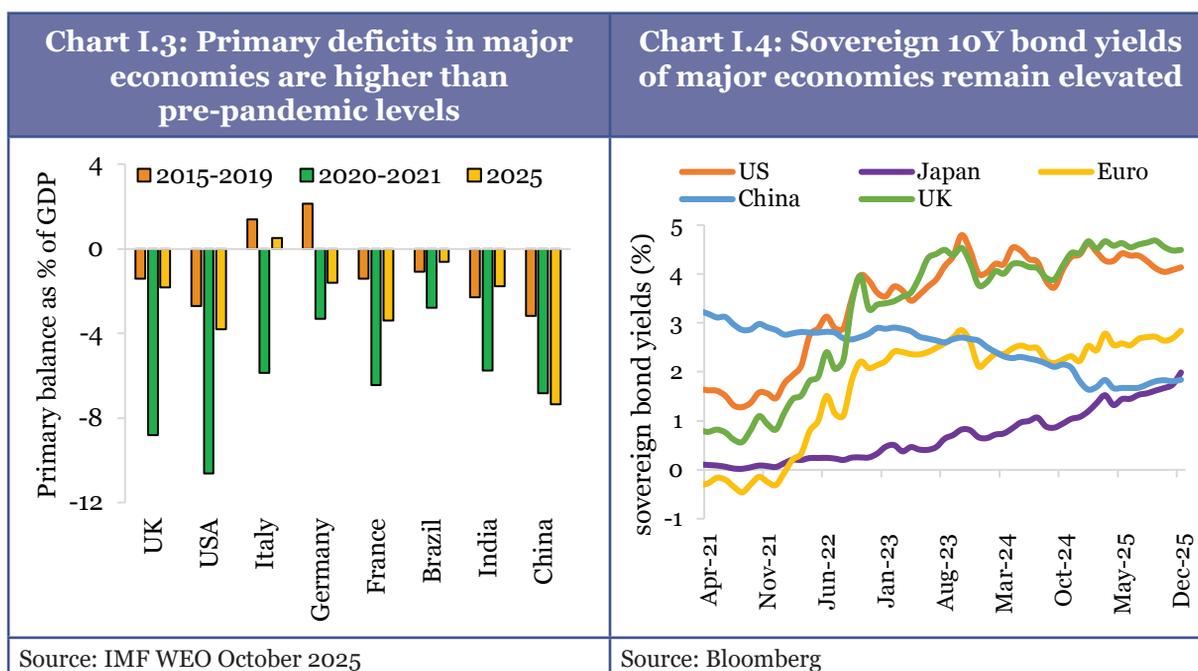
1.3. Globally, the shift from aggressive monetary policy tightening to a neutral or accommodative stance is still underway. However, the aforementioned variance in growth-inflation dynamics has led to divergent trajectories of central bank policy rates across these economies (Charts I.1 and I.2). This has implications for capital flows as fund houses trot the globe in search of higher yields.



1.4. Amidst ongoing weaknesses in growth and inflation, fiscal policies in major economies stay expansionary. While the projected primary deficits for 2025 are

- 1 Aldasoro, I., Doerr, S., & Rees, D. (2026, January 7). Financing the AI boom: From cash flows to debt (BIS Bulletin No. 120). Bank for International Settlements. <https://www.bis.org/publ/bisbull120.pdf>
- 2 European Commission, Directorate-General for Economic and Financial Affairs. (2025, November 17). Autumn 2025 economic forecast shows continued growth despite challenging environment. Economy and Finance. <https://tinyurl.com/3zc6bv8j>

generally smaller than the record deficits of 2020 and 2021, when substantial fiscal stimulus was used to address the pandemic impact, they are still significantly higher than pre-pandemic levels, except in Brazil and India (Chart I.3). Long-term borrowing costs for the world’s biggest economies have stayed elevated as investors question the ability of governments to cover massive budget deficits. These pressures are showing in elevated bond yields across major AEs, particularly in the ultra-long tenure segment (Chart I.4). Earlier in May 2025, 30-year bond yields reached a peak of 5.15 per cent in the US, approaching levels last seen in 2007. Those in Japan exceeded the highest on record in data since 1999, with auctions in both countries drawing tepid demand. Long-dated bonds in the UK, Germany and Australia also faced selling pressure.<sup>3</sup>

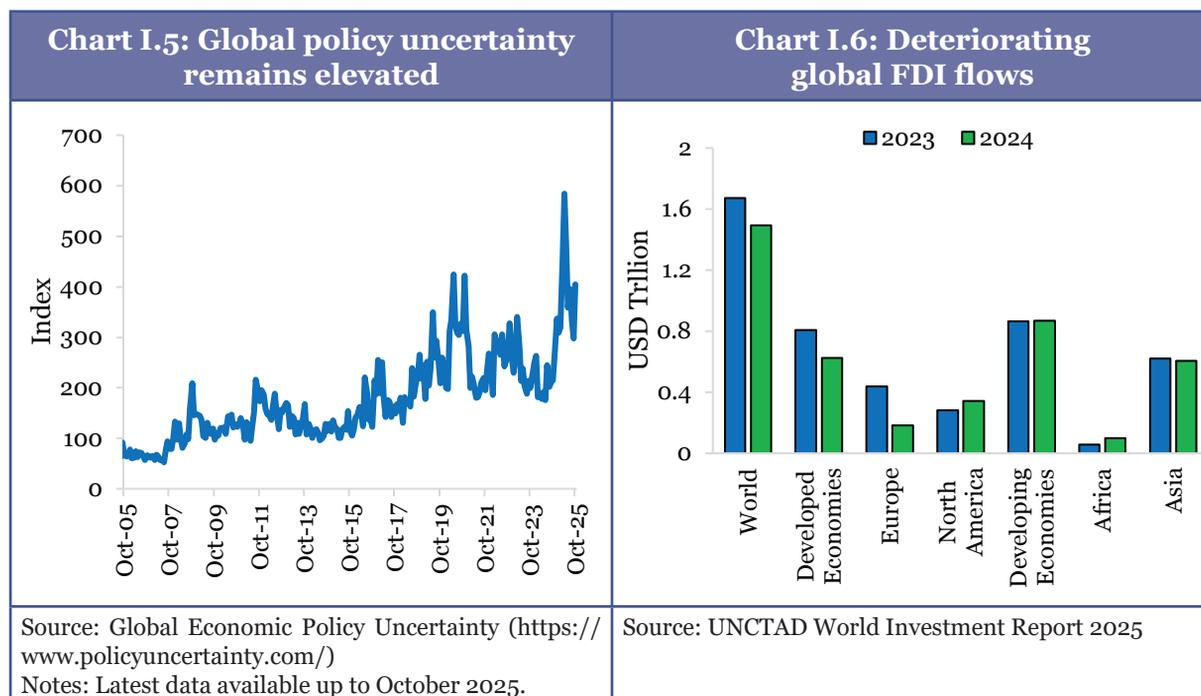


1.5. Global economic uncertainty remains elevated compared to historical trends (Chart I.5), primarily on account of fragmentation in geopolitical relationships and lower visibility on policy continuity. This, coupled with the aforementioned macroeconomic developments, has led to a deterioration in global foreign direct investment (FDI) flows. As per the United Nations Conference on Trade and Development’s (UNCTAD) World Investment Report 2025<sup>4</sup>, FDI flows in 2024, barring those in certain conduit economies, declined by 11 per cent YoY (Chart I.6). Capital flows are also increasingly being shaped by the surge in demand across the AI supply chain in a few countries. While FDI flows in most developed countries fell, they rose by 19.7 per cent in the US. Among the top 10 highest-value greenfield projects announced in 2024, four were in

3 <https://www.bloomberg.com/news/articles/2025-05-22/long-term-bond-yields-soar-globally-on-fiscal-policy-fears>

4 United Nations Conference on Trade and Development. (2025). World Investment Report 2025: International investment in the digital economy (UNCTAD/WIR/2025). UNCTAD. [https://unctad.org/system/files/official-document/wir2025\\_en.pdf](https://unctad.org/system/files/official-document/wir2025_en.pdf)

semiconductor manufacturing, with three of them located in the United States.<sup>5</sup> Data centre development is also expanding rapidly, driven by growing digital demand and strategic industrial policies.



1.6. The global economy has entered a phase in which geopolitical considerations exert a much stronger influence than they did in the 2010s. Rapidly evolving country alignments and supply chains, as well as technological developments, necessitate supplementing traditional economic assessments with a geopolitical perspective. In this context, Box I.1 elaborates on the resurgence of economic statecraft and the implications for our development strategy.

**Box I.1: The resurgence of economic statecraft and the imperative of achieving strategic resilience and indispensability**

Over the past few years, ‘Economic Statecraft’, broadly defined as the deliberate use of economic means to achieve strategic ends, has witnessed a rapid resurgence. This shift reflects rising geopolitical competition, concerns over technological dominance and vulnerabilities exposed in traditional global value chains.

How does economic policy differ from economic statecraft? Economic policy employs traditional instruments, including fiscal, monetary, and trade tools, to achieve economic objectives such as reducing deficits, controlling inflation, and promoting economic growth. Economic statecraft goes a step further by employing economic tools to achieve foreign policy or national security objectives, such as compelling a country to stop hostilities with a third party or to liberalise its markets.

<sup>5</sup> Ibid

Economic statecraft is not new. Historical examples include the Megarian Decree imposed by Athens in ancient Greece<sup>6</sup> and the Roman Empire's grain provisioning system (Cura Annonae<sup>7</sup>). Kautilya's Arthashastra is recognised as a systematic treatise on statecraft that integrates economic governance with political and strategic imperatives.

In the modern world, recent experience illustrates that economic interdependence, once viewed as a source of mutual stability, is now increasingly perceived as a channel of vulnerability. Disruptions during the pandemic, the weaponisation of energy and finance during geopolitical conflicts, and the growing use of export controls in advanced-technology sectors have underscored the limits of efficiency-driven global integration. Advanced and emerging economies alike are therefore re-evaluating their exposure to concentrated supply chains, critical raw materials, and key technologies, often under the pretext of security.

The drivers behind the resurgence of economic statecraft include, but are not limited to, the following:

- Across regions, the resurgence of ultra-nationalism, rooted in claims of cultural superiority and an anti-immigrant stance, is increasingly shaping political and policy choices. This shift is narrowing the space for multilateral cooperation and rule-based trading, while hardening domestic borders and constraining labour mobility. Overall, this has reoriented economic strategies toward inward-looking priorities.
- A growing number of nations are becoming increasingly sceptical of free trade and multilateral institutions, which are believed to have led to large and concentrated global trade imbalances. In geology, the Earth's crust remains stable because creation and destruction proceed in balance: new crust is continuously born at the Mid-Atlantic Ridge, while old crust is absorbed at subduction zones around the Pacific. This geological fact offers a powerful metaphor for the global economic order, where stability likewise depends on a steady equilibrium between producers who generate surpluses and consumers who absorb them. When large surplus and deficit nations diverge in the pace of creation and absorption, the resulting imbalances generate stress that fractures the global economic landscape.
- The lack of updated global norms to govern competition, investment, and subsidies across different development models, which led to the build-up of imbalances and

6 The Megarian Decree was an economic sanction imposed by Athens on the city-state of Megara around 432 BCE, just before the outbreak of the Peloponnesian War. Under the decree, Megarian merchants were barred from markets and ports controlled by the Athenian Empire, effectively cutting the city off from regional trade and severely damaging its economy. Although Athens justified the measure on religious and legal grounds (that Megarians were cultivating sacred land belonging to Demeter and were harbouring runaway slaves), it was widely seen as a strategic attempt to assert dominance and punish Megara, an ally of Sparta. Sparta demanded the repeal of the decree, and Athens' refusal significantly escalated tensions, contributing to the onset of the war. The episode is often cited as one of the earliest examples of economic sanctions being used as a tool of statecraft, highlighting how trade restrictions can precipitate major geopolitical conflicts.

7 It involved the procurement, storage, and distribution of grain, largely sourced from provinces such as Egypt and North Africa, which were then under Roman control, and later included free or subsidised grain distributions to Roman citizens. Administered by state officials and backed by imperial authority, the Cura Annonae was both an economic and political instrument, aimed at preventing famine, controlling food prices, and maintaining social stability. It is often regarded as one of the earliest examples of large-scale public welfare and state intervention in markets.

strategic distrust, is fostering a more fragmented and polarised global order, accompanied by a weakening, both institutional and financial, of traditional standard-setting international bodies.

- Consequently, geopolitical tensions have intensified. Armed conflict has flared up in Eastern Europe and Western Asia after decades of relative peace. Even traditionally pacifist nations like Japan have upped their defence spending to 2 per cent of their GDP.
- Strategic competition is increasingly fuelling trade wars, while nations vie for access to critical minerals and technological resources in a manner reminiscent of a new colonial scramble.
- Given this and in the aftermath of Covid-19 pandemic, companies are looking to manage their supply chains in a manner that reduces geopolitical risk in order to minimise the chances of disruptions and bottlenecks. Governments are engaging in this process by incentivising companies to develop local supply chains in strategic sectors and to adopt friend-shoring and near-shoring (See Chart IV.1 in Chapter IV).
- Countries are increasingly focusing on emerging strategic industries such as renewable energy, electric vehicles, critical minerals, semiconductors, and AI, which are viewed as critical for economic growth, national security and supremacy, and in the process, advancing state support, including as equity investments, into bigger industrial players, who otherwise would not have been in the perimeter for state benefits.

Economic statecraft can manifest as either ‘carrots’ or ‘sticks’, depending on the objective and the parties involved. Tools of economic statecraft can be broadly categorised into the domains of trade, capital and other tools. Some recent examples of tools deployed include:

- **US’ export controls on critical technologies:** The United States has imposed extensive export controls on advanced semiconductors and associated manufacturing equipment to constrain China’s access to next-generation AI and chip technologies, expanding coverage based on end-use and foreign-direct product rules.<sup>8</sup> These measures aim to hinder strategic military and civilian capabilities in rival states.
- **Dual-use and critical mineral export restrictions:** China has tightened export licensing and controls on key rare earth elements and permanent magnet materials essential for defence, electronics, and energy transitions. In early 2026, China banned certain dual-use item exports to Japan, including materials crucial to the automotive and technology sectors, in response to diplomatic tensions.<sup>9</sup>
- **Sanctions and blacklists:** Chinese authorities have added foreign defence and technology firms to “Unreliable Entities Lists,” restricting trade and investment in response to perceived national security threats, while Western nations have used sanctions against Russian entities to constrict war-related supply chains.

8 Foreign-Direct Product Rules are provisions in U.S. export control law that allow the US to regulate certain goods made outside the US if those goods are produced using U.S.-origin technology, software, or manufacturing equipment and are destined for a restricted end-user (for example, a sanctioned firm or country)

9 Reuters. (2026, January 8). China curbs rare earth exports to Japanese companies after dual-use ban, WSJ reports. Reuters. <https://tinyurl.com/7xf4ntek>

- **Tariffs:** Rolled out in 2023 and fully effective from 2026, the EU Carbon Border Adjustment Mechanism (CBAM) puts tariffs on imports like steel and cement based on embedded emissions, targeting high-pollution exporters (e.g., China, India) as classified under EU methodology, to protect European industry alongside achieving climate goals.
- **Fiscal policy:** Fiscal policy is inherently a form of statecraft: it primarily hinges on the allocation of expenditures and the extent to which the fiscal deficit can be expanded and financed during a geopolitical crisis. Currently, for instance, European economies face the challenge of balancing demands for increased defence spending to ensure external stability, augmented social spending to sustain internal stability, enhanced green initiatives to promote climate stability, and adherence to strict fiscal deficit or public debt-to-GDP ratio targets to retain economic stability. China utilises its fiscal power to construct infrastructure in other countries through its Belt and Road Initiative, aiming to enhance its trade and economic dominance.

Against this backdrop, India's reforms and economic performance over the previous decade have helped it stay relevant and resilient, capable of withstanding and adapting to external economic pressures and statecraft without disproportionate disruption. We must now move a step further and focus on deliberately cultivating strategic indispensability. Strategic indispensability arises when an economy offers goods, services, or roles that are sufficiently critical to global value chains that partners cannot easily substitute, thereby reducing the effectiveness of coercive measures. As a large and rapidly growing economy, India possesses scale, diversity, and capabilities that can anchor it firmly within global economic networks. By strengthening these domestic capabilities, maintaining macroeconomic stability, and actively shaping rules and standards in emerging areas such as digital public infrastructure, India can ensure that integration works as a source of influence and insurance, rather than vulnerability. In an era where economic instruments are increasingly used as tools of statecraft, building such indispensability is central to safeguarding growth, policy space, and long-term economic sovereignty. This mechanics are detailed in Chapter 16 (Part-I) and (Part-II) of this survey.

1.7. Against this global backdrop, this chapter reviews the performance of the Indian economy as reflected in the First Advance Estimates for FY26. It analyses the demand and supply side drivers of growth during the first half of FY26, supplemented by an assessment of high-frequency indicators for the third quarter. The chapter then examines key macroeconomic fundamentals, including trends in inflation, financial sector conditions, fiscal policy, external stability, and labour market developments. It concludes with an assessment of the near-term outlook for the economy as it heads into FY27.

## TRENDS IN THE DOMESTIC ECONOMY

### Advance Estimates for FY26 reflect strong growth momentum

1.8. Even as the global economy navigates uncertainty, India continues to chart a

strong growth path, as reflected in the First Advance Estimates (FAE) for FY26 released by the Ministry of Statistics and Programme Implementation (MoSPI). These estimates place the real GDP growth rate at 7.4 per cent and the GVA growth rate at 7.3 per cent, surpassing earlier projections by various agencies and our own estimates in the Economic Survey of 2024-25, and reaffirming India's status as the fastest-growing major economy for the fourth consecutive year. On the demand side, domestic demand continues to anchor growth, supported by a strengthening momentum in capital formation. On the supply side, manufacturing activity has gained traction, and services continue to drive overall expansion, led by steady performance in trade, transport, and financial and professional services. (see Table I.2a). The following sub-section examines the sectoral composition and drivers of growth in H1 and the implied growth in H2 of FY26.

**Table I.2a: Demand and Supply side drivers of growth**

Real Growth, YoY, Percent				
Production Approach (Supply Side)				
	H1: FY25	H1: FY26	FY25 (PE)	FY26 (FAE)
<b>Agriculture, Livestock, Forestry &amp; Fishing</b>	<b>2.7</b>	<b>3.6</b>	<b>4.6</b>	<b>3.1</b>
<b>Industry</b>	<b>6.1</b>	<b>7</b>	<b>5.9</b>	<b>6.2</b>
Mining & Quarrying	3.6	-1.8	2.7	-0.7
Manufacturing	4.8	8.4	4.5	7.0
Electricity, Gas, Water Supply & Other Utility Services	6.5	2.4	5.9	2.1
Construction	9.3	7.4	9.4	7.0
<b>Services</b>	<b>7.0</b>	<b>9.3</b>	<b>7.2</b>	<b>9.1</b>
Trade, Hotels, Transport, Communication & Services related to Broadcasting	5.8	8	6.1	7.5
Financial, Real Estate & Professional Services	6.9	9.9	7.2	9.9
Public Administration, Defence & Other Services	8.9	9.7	8.9	9.9
<b>GVA at Basic Prices</b>	<b>6.2</b>	<b>7.9</b>	<b>6.4</b>	<b>7.3</b>
Expenditure Components (Demand Side)				
Private Final Consumption Expenditure (PFCE)	7.3	7.5	7.2	7.0
Government Final Consumption Expenditure (GFCE)	1.9	2.5	2.3	5.2
Gross Fixed Capital Formation (GFCF)	6.7	7.6	7.1	7.8
Exports	5.5	5.9	6.3	6.4
<b>GDP</b>	<b>6.1</b>	<b>8.0</b>	<b>6.5</b>	<b>7.4</b>
Source: MoSPI				

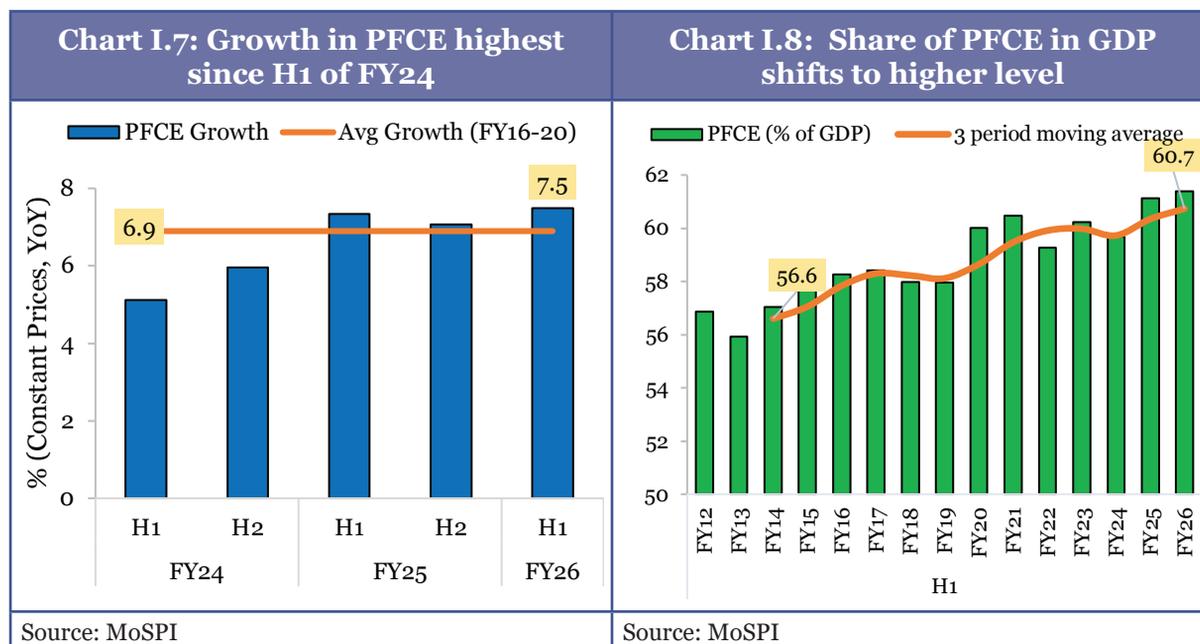
**Table I.2b: Sectoral contribution to GDP**

Share as % of Nominal GDP, Percent				
<b>Production Approach (Supply Side)</b>				
	<b>H1: FY25</b>	<b>H1: FY26</b>	<b>FY25 (PE)</b>	<b>FY26 (FAE)</b>
<b>Agriculture, Livestock, Forestry &amp; Fishing</b>	<b>14.0</b>	<b>13.2</b>	<b>16.3</b>	<b>15.2</b>
<b>Industry</b>	<b>24.5</b>	<b>24.3</b>	<b>24.6</b>	<b>24.3</b>
Mining & Quarrying	1.6	1.4	1.6	1.4
Manufacturing	12.7	13.0	12.6	12.8
Electricity, Gas, Water Supply & Other Utility Services	2.5	2.4	2.4	2.3
Construction	7.7	7.6	7.9	7.8
<b>Services</b>	<b>52.6</b>	<b>53.6</b>	<b>49.9</b>	<b>51.1</b>
Trade, Hotels, Transport, Communication & Services related to Broadcasting	15.1	15.0	15.9	15.8
Financial, Real Estate & Professional Services	23.7	24.3	20.8	21.4
Public Administration, Defence & Other Services	13.7	14.3	13.2	13.8
<b>Expenditure Components (Demand Side)</b>				
Private Final Consumption Expenditure (PFCE)	61.1	61.4	61.4	61.5
Government Final Consumption Expenditure (GFCE)	10.0	9.6	10.0	9.9
Gross Fixed Capital Formation (GFCF)	30.6	30.5	29.9	30.0
Exports	21.1	21.2	21.2	21.5
Source: MoSPI				

### **Demand side: Domestic drivers anchor GDP growth in FY26**

1.9. Domestic demand continues to underpin economic growth in FY26. According to the FAE, the share of final private consumption expenditure (PFCE) in GDP rose to 61.5 per cent in FY26, the highest level since FY12. This is corroborated by the strong performance during the first half of the year, with PFCE growing by 7.5 per cent in H1 of FY26, and its share in GDP rising to 61.4 per cent. This is the fastest growth rate since the first half of FY23 and remains higher than the pre-COVID trend of 6.9 per cent<sup>10</sup> (Chart I.7). This strength in consumption reflects a supportive macroeconomic environment, characterised by low inflation, stable employment conditions, and rising real purchasing power. Moreover, steady rural consumption, bolstered by strong agricultural performance, and the gradual improvement in urban consumption, aided by the rationalisation of direct and indirect taxes, reaffirm that the momentum in consumption demand is broad-based.

<sup>10</sup> Average PFCE growth during H1 and H2 of FY16-FY20



1.10. It may be noted that implicit H2 estimates derived from the FAE indicate a slight moderation in consumption growth. FAE, however, are based on an extrapolation of FY25 consumption levels using data available up to November and are therefore subject to revision as additional information becomes available. Subsequent estimates, incorporating full-year data, will provide a more complete assessment of private consumption performance during FY26, including the impact of recent tax reforms. Currently, the strong consumption growth observed in H1, along with supportive high-frequency indicators during Q3 of FY26, suggests that private consumption is likely to remain resilient throughout the year.

1.11. The key high-frequency indicators for the third quarter of FY26, including automobile and tractor sales, as well as air passenger traffic, signal the continuation of the robust demand conditions (Table I.3). Furthermore, in the November 2025 round of the NABARD Rural Economic Conditions and Sentiments Survey<sup>11</sup> 79.2 per cent of rural households reported increased consumption during the last year, with the share of monthly income spent on consumption rising to about 67 per cent, the highest since the survey's inception. This buoyancy in consumption demand can be attributed to the positive impact of GST rate rationalisation and softer inflation, improving the real purchasing power of rural non-farm income.

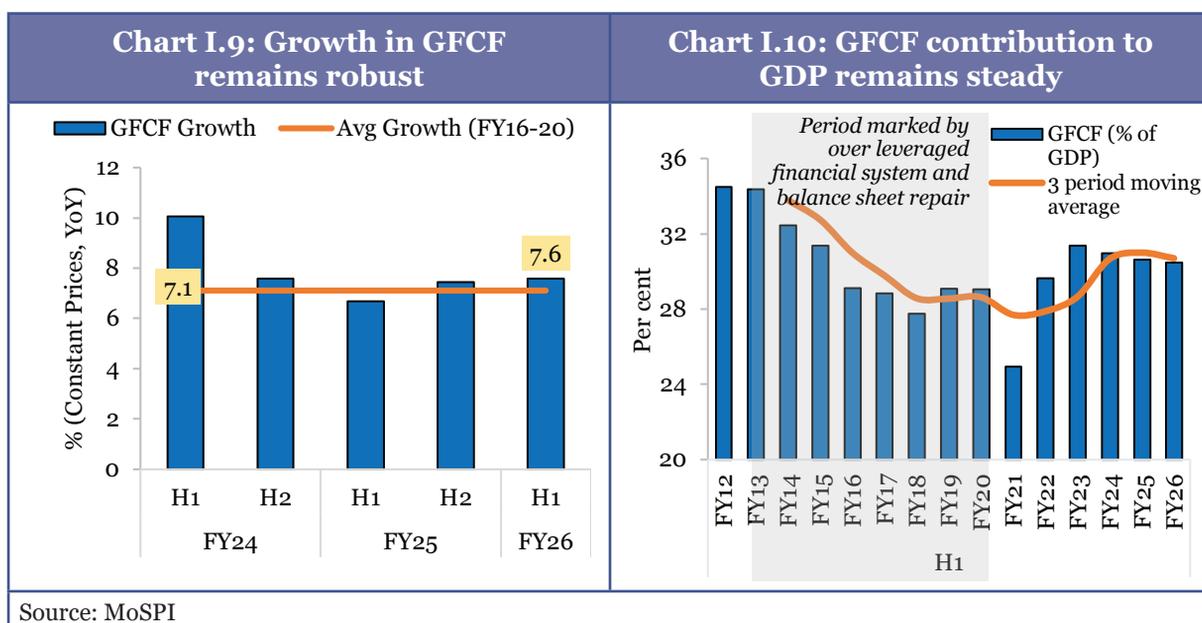
<sup>11</sup> National Bank for Agriculture and Rural Development (NABARD). (November, 2025). Rural Economic Conditions and Sentiments Survey (RECSS): 8th round. NABARD. (<https://tinyurl.com/5n5ku8rm>)

**Table I.3: Performance of high-frequency indicators indicates resilient domestic demand (YoY growth, per cent)**

Sector	Indicators	Q1 FY26	Q2 FY26	Q3 FY26	Monthly Avg YoY Growth (FY16-FY20)
<b>Urban Demand</b>	UPI Transaction	33.3	33.0	28.7	-
	FMCG Vol. Sales (Urban)	4.6	5.6	NA	NA
	Passenger Vehicle Sales	0.0	-2.9	20.5	1.4
	Domestic Air Passenger*	5.3	-1.9	5.3	14.9
<b>Rural Demand</b>	FMCG Vol. Sales (Rural)	8.4	7.7	NA	NA
	Two-wheeler Vehicle Sales	-6.2	7.4	16.9	2.5
	Three-wheeler Vehicle Sales	0.1	9.8	14.0	9.2
	Tractor Sales	9.2	30.7	23.2	7.3

Source: SIAM, NPCI, Tractor and Mechanisation Association, NielsenIQ, Airport Authority of India  
Note: \*Data up to November 2025. NA: Not available

1.12. Along with consumption, investment has continued to anchor growth in FY26, with the share of gross fixed capital formation (GFCF) estimated at 30.0 per cent. Investment activity strengthened in the first half of the year, with, GFCF expanding by 7.6 per cent, exceeding the pace recorded in the corresponding period last year and remaining above the pre-pandemic average of 7.1 per cent (Chart I.9). This momentum was buoyed by sustained public capital expenditure<sup>12</sup> and a revival in private investment activity as evident from corporate announcements.<sup>13</sup> Reflecting this strength, the share of GFCF in GDP remained steady at 30.5 per cent in H1 of FY26, well above the pre-pandemic average of 28.6 per cent (Chart I.10). Together, these developments indicate a strengthening of the investment cycle, supporting growth.



<sup>12</sup> During the current fiscal year, capex recorded a strong rebound, rising by 28 per cent YoY during April-November 2025.

<sup>13</sup> As per CMIE database, private corporate investment announcements totalled ₹ 14.6 lakh crore in H1 of FY26 Vs ₹ 7.9 lakh crore in H1 of FY25 and the previous decadal peak of ₹ 11.4 lakh crore in H1 of FY24.

1.13. The implicit H2 estimate of GFCF for FY26<sup>14</sup> indicates a firming of the investment cycle, likely driven by continued growth in non-food bank credit, coupled with capacity utilisation remaining above its long-term average. High-frequency indicators for the third quarter also suggest healthy investment activity. In particular, the Index of Industrial Production (IIP) shows sustained strength in capital goods, while imports of capital goods continue to record strong growth. (Table I.4).

**Table I.4: High-frequency indicators signalling firming investment momentum (YoY growth, per cent)**

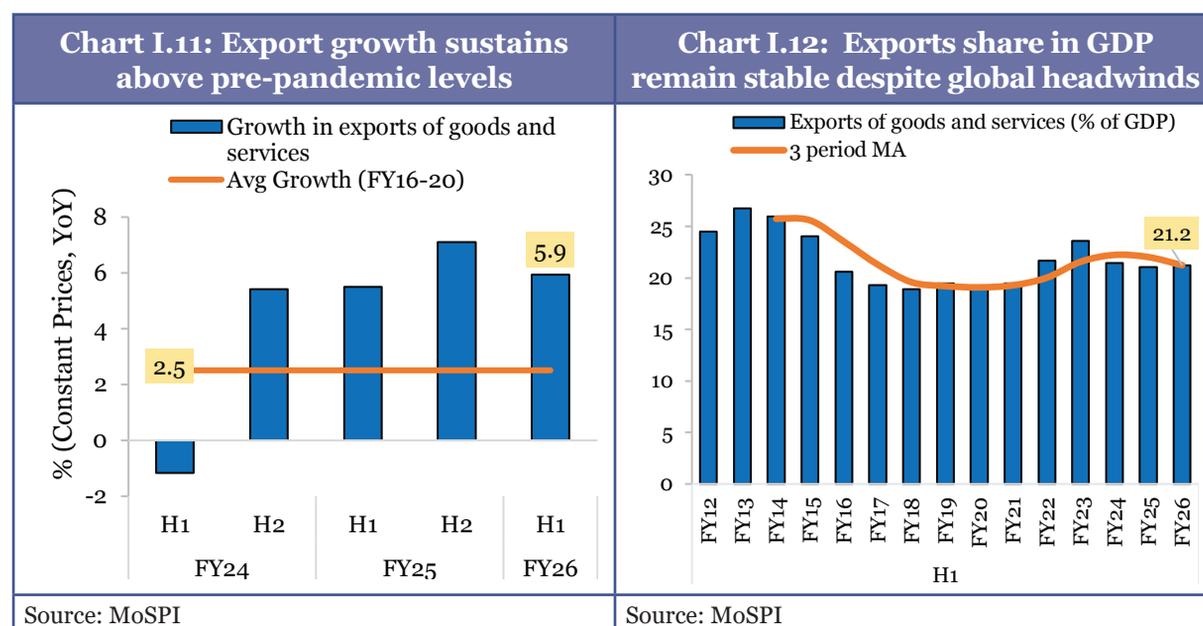
Indicators	Q1 FY26	Q2 FY26	Q3 FY26	Monthly Avg YoY Growth (FY16-FY20)
Non-food bank credit	10.2	10.4	14.4	9.7
IIP Capital goods*	9.8	5.6	6.2	0.2
Capital Goods Imports*	6.6	9.2	13.4	7.1
Capacity Utilisation (in %)	74.1	74.8	NA	72.9

Source: MoSPI, Ministry of Commerce and Industry, RBI

Note: \*Data up to November 2025.

Capital goods imports are defined as the aggregate of imports of electric machinery and equipment; base metals excluding iron and steel; industrial machinery, including machinery for dairy and allied uses; machine tools; other construction machinery; project goods; and transport equipment.

1.14. While domestic drivers remained the primary source of growth in FY26, external demand<sup>15</sup>, with a share of 21.6 per cent of GDP, also supported growth. In the first half of FY26, exports of goods and services grew by 5.9 per cent, exceeding the growth seen in the same period last year, and remaining above the pre-pandemic average, supported by trade diversification (Chart I.11). Services exports have continued to provide a stable anchor for growth, partially offsetting the greater volatility in goods exports, amid tariff related uncertainties. The broader external sector dynamics are examined in detail in Chapter 4.



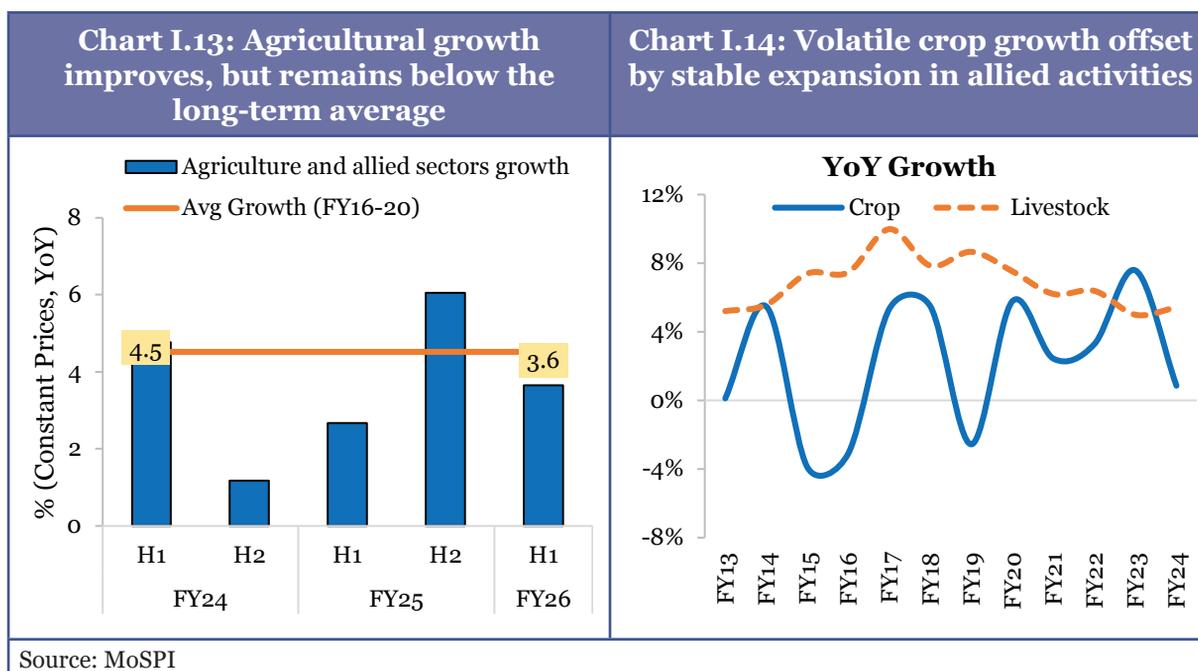
<sup>14</sup> Calculated using FAE and H1 of FY26

<sup>15</sup> i.e., the share of exports of goods and services in GDP

1.15. The implicit H2 estimate for exports of goods and services suggests that trade activity is likely to remain resilient. At the same time, trade data for Q3 of FY26 indicate some softening in export growth, with core<sup>16</sup> goods and services exports expanding by 3.5 per cent and 1.4 per cent, respectively, on a year-over-year basis on account of high base of last year. Looking ahead, export momentum is expected to strengthen, supported by advancing bilateral trade negotiations with the United States, trade agreements with other major economies, and continued efforts to diversify export markets.

### Industry and Services lead supply-side growth in FY26

1.16. From a supply-side perspective, growth in GVA during FY26 was led by the industry and services sectors, supported by sustained capital expenditure, improved capacity utilisation, and steady demand for services. Agriculture has provided a stabilising force, with output supported by favourable monsoon conditions and steady value addition from allied activities.



1.17. Agriculture and allied services are estimated to grow by 3.1 per cent in FY26. Agricultural activity in H1 FY26 was supported by a favourable monsoon. Agricultural GVA grew by 3.6 per cent, higher than the 2.7 per cent growth recorded in H1 FY25, but remained below the long-term average<sup>17</sup> of 4.5 per cent (Chart I.13). This trend reflects the structural characteristics of agricultural growth rather than short-term weather conditions. Crop-sector growth, which accounts for more than half of agricultural GVA, has been marked by significant year-to-year variability and has not exhibited a sustained upward trend, reflecting limited productivity gains over time (See Chapter

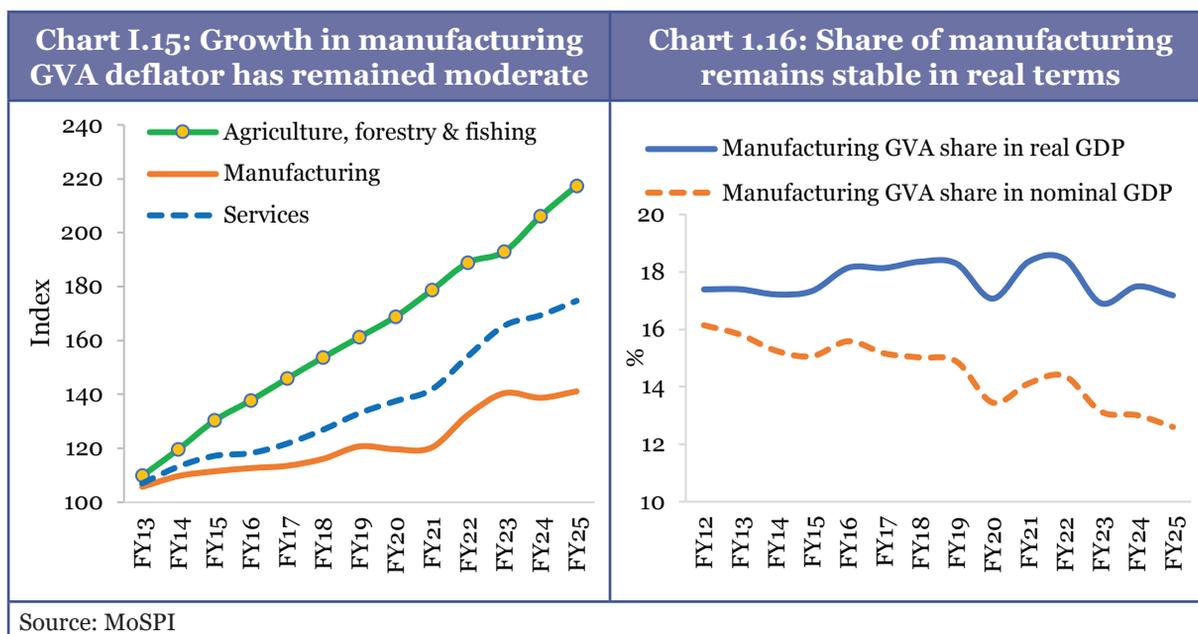
<sup>16</sup> Non-petroleum & Non-Gems & Jewellery exports

<sup>17</sup> FY16-FY25

6 for details). By contrast, allied activities, particularly livestock and fisheries, have grown at relatively stable rates of around 5-6 per cent (Chart I.14). As their share in agricultural GVA has increased, aggregate agricultural growth has increasingly reflected a weighted outcome of volatile crop performance and a relatively stable expansion in allied sectors.

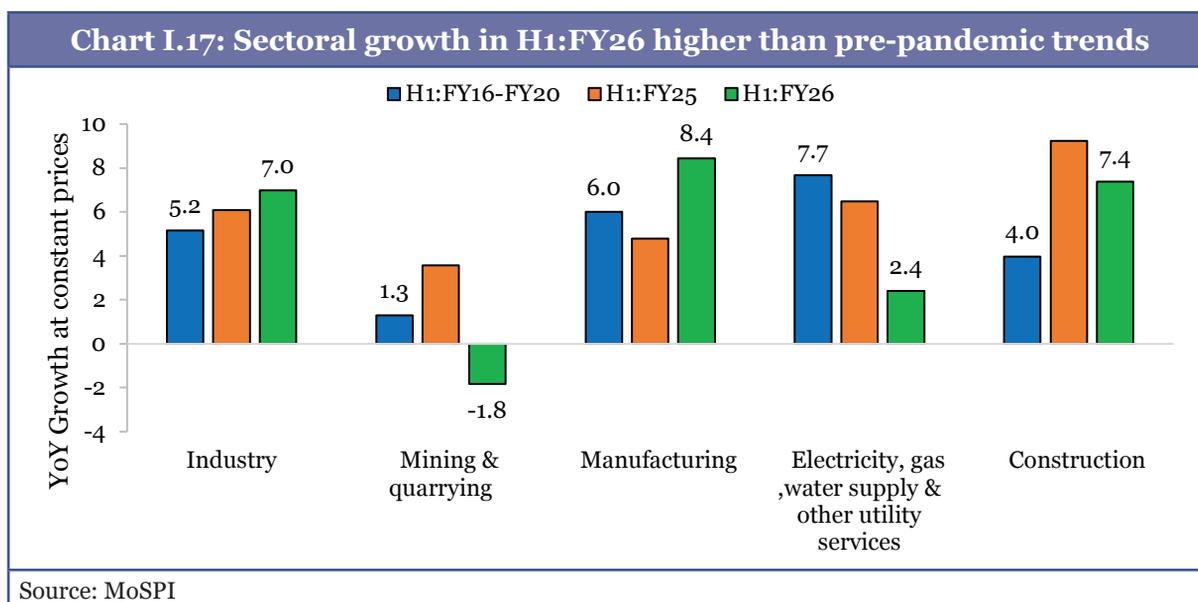
1.18. Rabi sowing has been progressing well, aided by replenished reservoir levels, adequate soil moisture, and sufficient availability of inputs. As of 16 January 2026, areas sown under major crops, wheat and gram, are respectively 1.9 per cent and 5.1 per cent higher than the corresponding period last year. Agricultural supply prospects, therefore, remain supportive. This is expected to strengthen farm incomes and sustain rural demand, enabling agriculture to provide a steady contribution to overall growth momentum in the second half of FY26.

1.19. Regarding the industry, a concern is often raised about its declining share in GVA. The compression in manufacturing's GVA share stems from relative price effects rather than reflecting a decline in manufacturing activities (See section 'GDP Deflators: Manufacturing's Reversal in Terms of Trade' in Chapter V) and higher intermediate consumption, which reduces net value added relative to sectors with greater pricing power, particularly services. In real (constant) price terms, manufacturing's share has remained steady at around 17-18 per cent (Chart I.16). Manufacturing's gross value of output (GVO) has remained broadly stable at around 38 per cent, comparable to services, indicating that output has been sustained. Moreover, in FY26, the industrial sector is expected to gain momentum, growing at 6.2 per cent, up from 5.9 per cent in FY25.



1.20. This assessment is supported by developments in the first half of FY26. The sector recorded growth of 7.0 per cent in the first half of FY26, exceeding the growth of 6.1 per cent in H1 of FY25 and the pre-COVID trend of 5.2 per cent (Chart I.17). Manufacturing was the primary driver, expanding by 8.4 per cent, reflecting resilient demand conditions and improved utilisation of existing capacities. Capacity utilisation in manufacturing remained above its long-run average during this period.<sup>18</sup> Growth in electricity, gas, water supply and other utilities was relatively modest at 2.4 per cent, lower than the pre-pandemic trend. The mining sector contracted by 1.8 per cent, partly due to disruptions caused by excessive rainfall.

1.21. Despite weather-related disruptions, construction activity recorded a 7.4 per cent growth, lower than in H1 of FY25 but underpinned by sustained public capital expenditure and ongoing momentum in infrastructure projects (See Chapter 9 for details). Overall, industrial growth remained broad-based, with most segments performing above their pre-pandemic trends.



1.22. The high-frequency indicators for Q3 of FY26, including the PMI manufacturing, IIP manufacturing, and e-way bill generation, signal a strengthening of manufacturing activity underpinned by robust demand (Table I.5). Construction indicators, such as steel consumption and cement production, have witnessed a steady growth. Looking ahead, momentum in industrial activity is expected to remain buoyant, boosted by the rationalisation of GST and a favourable demand outlook.

<sup>18</sup> Reserve Bank of India. (2025). Governor's statement: Monetary policy statement, 2025-26 (December 3-5). (<https://tinyurl.com/6kzamy5m>)

**Table I.5: High-frequency indicators suggest strengthening of industrial activity (YoY growth, per cent)**

Sector	Indicators	Q1 FY26	Q2 FY26	Q3 FY26	Monthly Avg YoY Growth (FY16-FY20)
Industry	E-way bill generation	20.5	23.1	19.4	16.6 <sup>\$</sup>
	IIP*	2.0	4.3	3.6	3.1
	8-Core Industries	1.5	4.5	1.9	3.5
	PMI Manufacturing <sup>^</sup>	58.1	58.7	56.9	51.9
Construction	Steel Consumption	7.8	8.5	3.9	5.7
	Cement Production	8.0	7.3	11.1	4.7
	IIP: Infra/ construction goods*	6.0	11.6	9.5	3.3

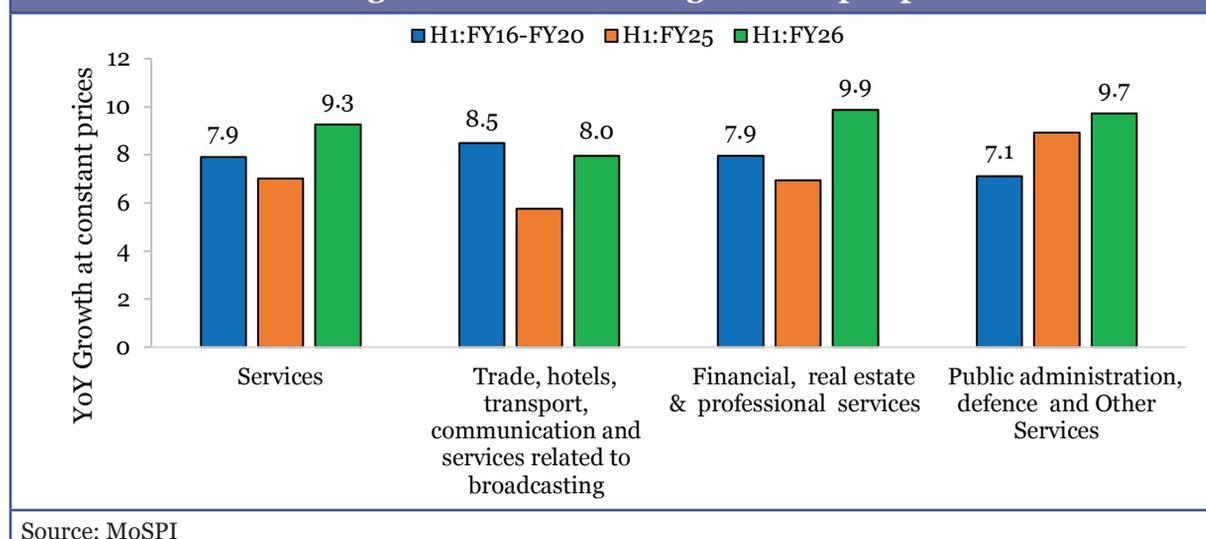
Source: IHS Markit, MoSPI, GSTN, Ministry of Commerce & Industry, Joint Plant Committee (JPC)  
Note: \*Data up to November 2025. \$ Data Available from FY20 onwards  
<sup>^</sup>PMI Manufacturing value corresponds to index value.

## Services Sector performance

1.23. Services, true to its label as the stabilising component of the GVA, is estimated to have grown by 9.1 per cent in FY26, up from 7.2 per cent in FY25, indicating a further acceleration in services-led expansion.

1.24. GVA in services grew by 9.3 per cent in H1 of FY26, exceeding the 7.0 per cent growth recorded in H1 of FY25 and the pre-pandemic average of 7.9 per cent (Chart I.18). This momentum gained further traction in H1 FY26, with its share in GDP rising to 53.6 per cent, surpassing the levels in H1 FY25 and the pre-pandemic period.

**Chart I.18: Sectoral growth in H1:FY26 higher than pre-pandemic trends**



1.25. Within the service sector, all sub-segments have grown past 9 per cent, save for the heavily Covid-impacted ‘trade, hospitality, transport, communication and related services’, which is still 50 basis points away from the pre-pandemic average.

1.26. Implicit estimate for H2 suggests a continuation of the services sector's momentum, supported by resilient domestic demand and steady export activity. The high-frequency indicators for Q3 FY26 corroborate this assessment. Services PMI readings, port cargo traffic, railway freight, and trends in passenger and air cargo movement indicate continued strength in service activity, even as some moderation has emerged in recent months. The easing observed in certain transport segments reflects a combination of temporary disruptions, short-term demand adjustments, elevated operating costs, capacity constraints, and geopolitical uncertainties affecting international routes.

**Table I.6: HFI indicators point to a continuation of momentum in service activity (YoY growth, per cent)**

Indicators	Q1 FY26	Q2 FY26	Q3 FY26	Monthly Avg YoY Growth (FY16-FY20)
PMI Services <sup>^</sup>	59.3	61.4	58.9	51.4
Port Traffic	5.6	5.9	13.1	4.0
Air Cargo*	5.4	4.1	6.1	6.0
Railway Freight Traffic	2.5	4.1	3.2	2.1
Hotel Occupancy Rate*	1.3	-1.3	1.5	1.2

Source: IHS Markit, IPA, AAI, Ministry of Railways, HVS Anarock  
 Note: \*Data up to November 2025. <sup>^</sup>PMI Services value corresponds to index value. The data of Railway freight is excluding KRCL.

1.27. Taken together across subsectors, national accounts data for the first half of FY26 and high-frequency indicators for Q3 indicate a continuation of the growth momentum during the year. Given the lag in the availability of official quarterly GDP estimates, a nowcasting exercise using high-frequency indicators provides a contemporaneous assessment of near-term growth conditions. The methodology and results of the nowcasting exercise are presented in Box I.2.

### Box I.2: Nowcasting India's quarterly GDP growth

The Covid-19 pandemic necessitated multiple lockdowns to prevent the spread of the virus in India. While they contributed to saving lives, the lockdowns disrupted economic activity. Even as multiple high-frequency indicators helped gauge sectoral performance, it was imperative to form an internal estimate of the direction of economic activity and growth to guide policymaking. This became all the more important as official estimates of quarterly GDP growth are released two months after the end of the quarter. It was against this backdrop that the economic division developed and refined a GDP Nowcasting model for internal use.

Nowcasting refers to the prediction of the present, the very near future and the very recent past, and that makes it more effective in shorter horizon forecasting (Banbura, Gianonne &

Reichlin, 2010).<sup>19</sup> The basic principle of nowcasting is the exploitation of the information which is published early and possibly at higher frequencies than the target variable of interest in order to obtain an ‘early estimate’ before the official figure becomes available. For instance, multiple high-frequency indicators (HFIs) published at monthly frequencies can be used to estimate GDP, which is published quarterly.

## Data

Amongst the multiple HFIs, 17 indicators with strong correlation with quarterly GDP growth are chosen. These are the Index of Industrial Production (IIP), automobile sales, non-oil exports, non-oil non-gold imports, PMI manufacturing, PMI Services, electricity consumption, tractor sales, air passenger traffic, number of aircraft movements, rail freight traffic, port cargo traffic, cement production, steel production, central government gross tax revenues, and coal production. The dataset spans January 2006 through the most recent available period.

## Methodology

The underlying model employed is a Dynamic Factor Model (DFM) described in Stock and Watson (1989).<sup>20</sup> The DFM is a statistical model used to capture the shared dynamics of multiple time series by representing them as a function of a few unobserved (latent) factors.

These factors summarise the co-movement among the observed variables while isolating idiosyncratic noise. The model can be expressed in a state-space framework comprising an observation equation and a state equation. The observation equation links the observed variables  $Y_t$  (an  $n \times 1$  vector) to the latent factors  $F_t$  (a  $k \times 1$  vector) as follows:

$$Y_t = \Lambda F_t + \varepsilon_t$$

where  $\Lambda$  is the  $n \times k$  matrix of factor loadings, and  $\varepsilon_t$  is the  $n \times 1$  vector of idiosyncratic errors assumed to be uncorrelated across series and over time. The state equation models the evolution of the latent factors  $F_t$ :

$$F_t = \Phi F_{t-1} + v_t$$

where  $\Phi$  is the  $k \times k$  transition matrix, and  $v_t$  is the  $k \times 1$  vector of factor disturbances typically assumed to follow a multivariate normal distribution.

In this case,  $Y_t$  is the vector of standardised YoY growth of the HFIs.<sup>21</sup> The number of factors to be extracted is determined by the variance explained by each additional factor. This is

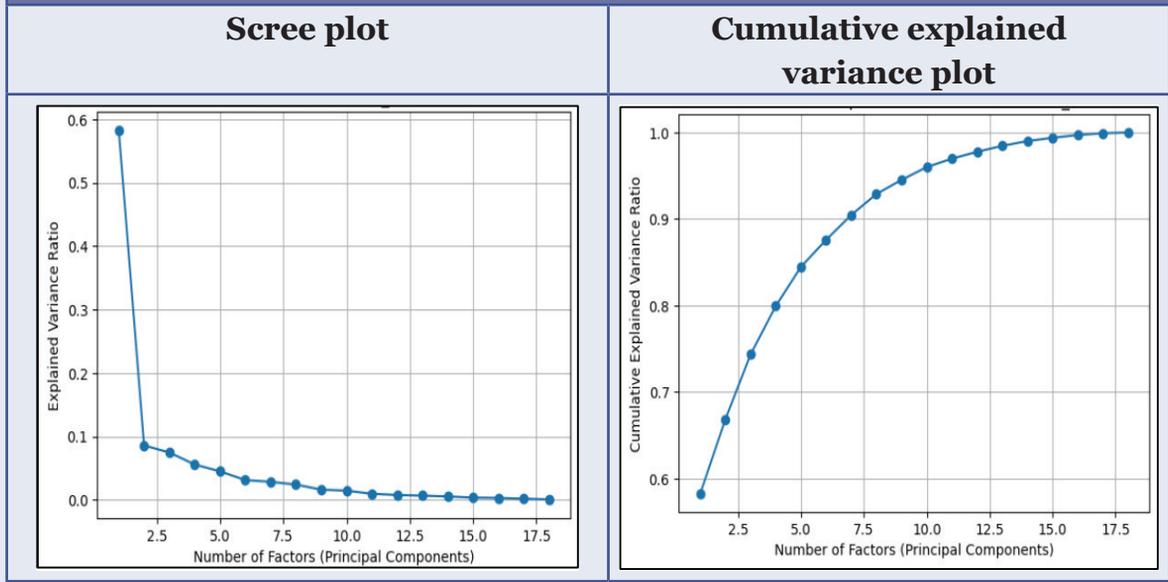
19 Banbura, Marta and Giannone, Domenico and Reichlin, Lucrezia, Nowcasting (November 30, 2010). ECB Working Paper No. 1275, Available at SSRN: <https://ssrn.com/abstract=1717887> or <http://dx.doi.org/10.2139/ssrn.1717887>

20 James H. Stock & Mark W. Watson, 1989. "New Indexes of Coincident and Leading Economic Indicators," NBER Chapters, in: NBER Macroeconomics Annual 1989, Volume 4, pages 351-409, National Bureau of Economic Research, Inc.

21 All variables except PMI manufacturing and PMI services are transformed into YoY growth values using log differences. PMI manufacturing and PMI services are used as is.

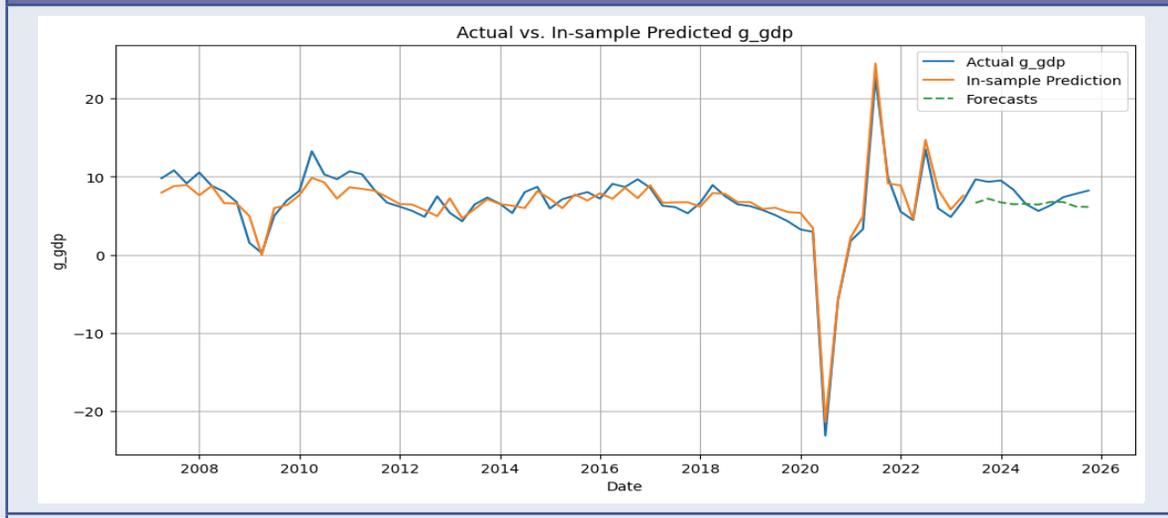
visualised in a “scree plot”.<sup>22</sup> The factors which explain the maximum variance in the movement of these transformed HFIs are used for estimating DFM here. Once the monthly factor is extracted, it is then resampled to a quarterly frequency, taking the mean of the monthly factor values within each quarter.

**Chart I.19: Scree plot and cumulative explained variance plot behind the nowcasting model**



Source: Author’s calculations

**Chart I.20: Actual vs predicted GDP growth using nowcasting model**



Source: Author’s calculations

<sup>22</sup> Nowcasting models often rely on DFMs to extract a small number of latent factors that capture the common movement across many indicators. The scree plot helps identify the number of factors that explain most of the variation, thereby ensuring parsimony in the model by avoiding overfitting through discarding noise-driven components. A sharp drop in values indicates the point beyond which additional factors add little explanatory power.

This quarterly factor is then used as an exogenous variable in modelling GDP growth as an Autoregressive Integrated Moving Average with Exogenous inputs (ARIMAX) process.<sup>23</sup> A dummy variable is also included to account for periods of extreme growth. The analysis obtained an in-sample root mean squared error (RMSE) of 1.6 and an out-of-sample RMSE of 0.87. The portmanteau test confirms that the residuals emerging from the ARIMAX model are white noise. Based on data until December 2025, the nowcast of real GDP growth for Q3 FY26 stands at 7 per cent.

1.28 The increasing use of high-frequency indicators and analytical tools such as nowcasting underscores the importance of timely, credible and granular data for macroeconomic assessment and policymaking. In this context, ongoing efforts to strengthen India's National Statistical System covering data generation, survey modernisation, macroeconomic rebasing and digital dissemination assume particular relevance. These initiatives are discussed in Box I.3.

### Box I.3: Strengthening India's National Statistical System: From Data Generation to Data Readiness

Sound public policy rests on timely, credible and granular data. Recognising this, the government has undertaken a comprehensive strengthening of the National Statistical System, spanning new data generation, survey modernisation, macroeconomic rebasing, digital dissemination and data harmonisation. Together, these efforts aim to improve evidence-based decision-making in a rapidly changing economy.

#### Expanding the data frontier through new surveys

To address long-standing data gaps, several major surveys are being introduced or relaunched.

The Annual Survey of Incorporated Service Sector Enterprises (ASISSE), expected to commence from April 2026, will for the first time provide a systematic coverage of the incorporated services sector. This complements the existing Annual Survey of Unincorporated Sector Enterprises (ASUSE), which regularly covers the unincorporated segment of the services sector.

The All India Debt and Investment Survey (AIDIS) 2026–27, scheduled to be conducted from July 2026 to June 2027, will provide comprehensive information on household asset ownership and indebtedness across rural and urban areas. The survey will aid in understanding credit markets and assessing inequality in asset distribution. Alongside this, the Situation Assessment Survey (SAS) on Rural Agricultural Households 2026–27 will offer a holistic picture of farm households, covering incomes, production, indebtedness, technology use and access to government schemes.

To fill a critical information gap, a dedicated Household Income Survey is planned tentatively in 2026. As regular surveys on household income have not been conducted in India, a Technical

<sup>23</sup> with parameters  $p = 1$ ,  $d = 0$ , and  $q = 1$ , i.e., as an ARIMAX process with AR(1), I(0) and MA(1)

Expert Group is providing guidance on concepts, definitions, methodology and survey instruments, while incorporating international best practices.

### **More frequent and granular statistics**

The statistical system is moving decisively towards higher-frequency and sub-state data. The Annual Survey of Unincorporated Sector Enterprises (ASUSE) is now released quarterly, while the sampling design of the Periodic Labour Force Survey (PLFS) has been revised to generate monthly and quarterly estimates. Broader coverage, through larger sample sizes and improved sample designs, has been introduced to enable district-level estimates for both PLFS and ASUSE by 2026.

The Forward-looking CAPEX Survey (first conducted in October 2024) provides valuable policy insights into expected investments by enterprises over two consecutive financial years. To meet immediate policy requirements, MoSPI has also conducted short-duration annual surveys such as the comprehensive modular surveys on telecom and education in 2025.

### **Modernising surveys and strengthening state statistical systems**

MoSPI has undertaken major survey system reforms and survey modernisation initiatives aimed at increasing both the frequency and diversity of surveys. Survey operations have been transformed through digitalisation. Computer-Assisted Personal Interviewing (CAPI), integrated with the cloud-based eSIGMA platform, enables real-time validation, monitoring, geotagging and faster data processing. As a result, survey reports are now released within 45 to 90 days, while monthly results are made available within 15 days.

In parallel, the revamping of the support for statistical strengthening scheme provides technical and financial assistance to states and union territories for strengthening state statistical systems and improving coordination across the federal statistical framework.

### **Rebasing macroeconomic indicators for a changing economy**

A major milestone is the rebasing of National accounts to 2022-23, scheduled for release on 27 February 2026. The new series incorporates the generation of key data sources for benchmark revisions through surveys and studies, methodological improvements, wider use of administrative data, and better coverage of the informal sector through regular use of updated survey data.

Some of the major changes contemplated in the new GDP series include:

- Segregation of activities of multi-activity enterprises
- Use of GST data for regional allocation in the private corporate sector
- Increased dynamism in measuring the household sector through survey results
- Improved estimation of private final consumption expenditure using administrative data sources such as e-Vaahan
- Use of single extrapolation and double deflation, wherever feasible, with deflators applied at more disaggregated levels
- Revision in the methodology of quarterly estimates through improved benchmarking and alignment of indicators, methodology and deflators with annual accounts

- Strengthening of informal sector estimates through the combined use of ASUSE and PLFS
- Reconciliation of production and expenditure-side estimates using the Supply and Use Tables (SUT) framework to address discrepancies in the existing series

In parallel, the **Index of Industrial Production (IIP)** is also being rebased to 2022-23, and is scheduled for release on 28 May 2026. The major methodological improvements proposed in the new series include:

- An updated item basket incorporating new and emerging industrial products, while removing obsolete items
- Selection and substitution of factories to ensure a representative sample and address closures and non-response
- Introduction of seasonal adjustment to smooth short-term variations
- Adoption of chain-based indices to enhance timeliness and representativeness
- Inclusion of “not elsewhere classified (n.e.c.)” items to better capture production

The **Consumer Price Index (CPI)** is being rebased to 2024, using the latest consumption patterns from the Household Consumption Expenditure Survey (HCES) 2023-24, with state-specific item baskets and wider price coverage across urban and rural markets. The new CPI series is expected to be released on 12 February 2026.

### Digital-first data dissemination

MoSPI has developed an integrated digital ecosystem to enhance the accessibility and usability of official statistics. The eSankhyiki Portal provides access to over 770 indicators, covering 18 statistical products and comprising approximately 136 million records sourced from MoSPI, RBI and other Ministries, through dashboards, APIs and customised downloads.

The Microdata Portal ensures structured access to unit-level data from 177 national surveys, aligned with internationally accepted metadata and documentation standards. Mobile access through the GoIStats app, extensive visualisation tools, and platforms such as PAIMANA<sup>24</sup> for monitoring large public projects, have significantly expanded the reach and impact of official data.

### Towards data harmonisation and AI readiness

Efforts are underway to harmonise datasets across Ministries and States through common standards, classifications and unique identifiers. The National Metadata Structure (NMDS 2.0) and the Statistical Quality Assessment Framework (SQAF), aligned with UN standards, aim to improve data quality, transparency and interoperability. Metadata repositories and standard operating procedures for resolving definitional divergences are laying the foundation for an integrated, AI-ready national statistical system.

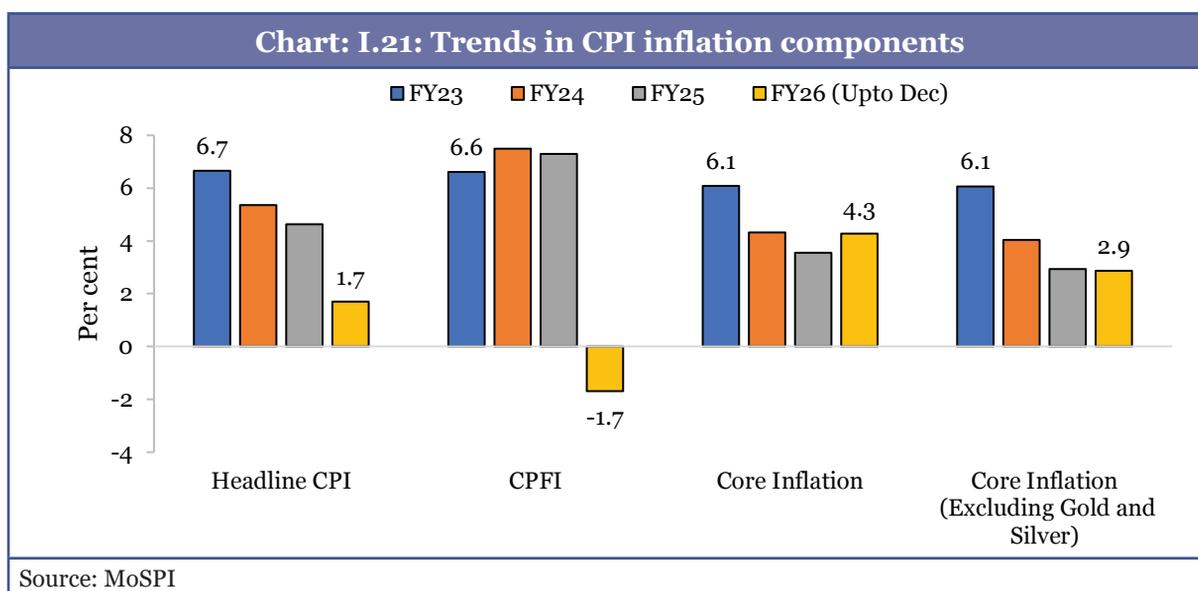
Taken together, these reforms mark a shift from periodic data collection to a continuous, technology-enabled and policy-responsive statistical system, strengthening the foundations of evidence-based governance in India.

<sup>24</sup> PIMANA- Project Assessment Infrastructure Monitoring and Analytics for Nation Building

## ASSESSMENT OF DOMESTIC MACROECONOMIC FUNDAMENTALS

### Inflation dynamics in the economy

1.29. The demand-led growth in the economy has unfolded alongside a marked easing of inflation, which has improved real purchasing power and supported consumption. Domestic inflation dynamics in FY26 (April-December) reflect a broad-based easing in price pressures, led by a sharp disinflation in food prices (Chart I.21). Headline CPI inflation declined to 1.7 per cent, driven primarily by corrections in vegetable and pulse prices, supported by favourable farm conditions, supply-side interventions, and a strong base effect. While core inflation has exhibited persistence, this has been largely influenced by price spikes in precious metals; adjusting for these, underlying inflation pressures appear materially softer, indicating limited demand-side overheating. Looking ahead, the inflation outlook remains benign, supported by favourable supply-side conditions and the gradual pass-through of GST rate rationalisation. However, the trajectory of core inflation will need to be closely monitored in the context of monetary policy easing and potential upward pressures from global base metal prices.



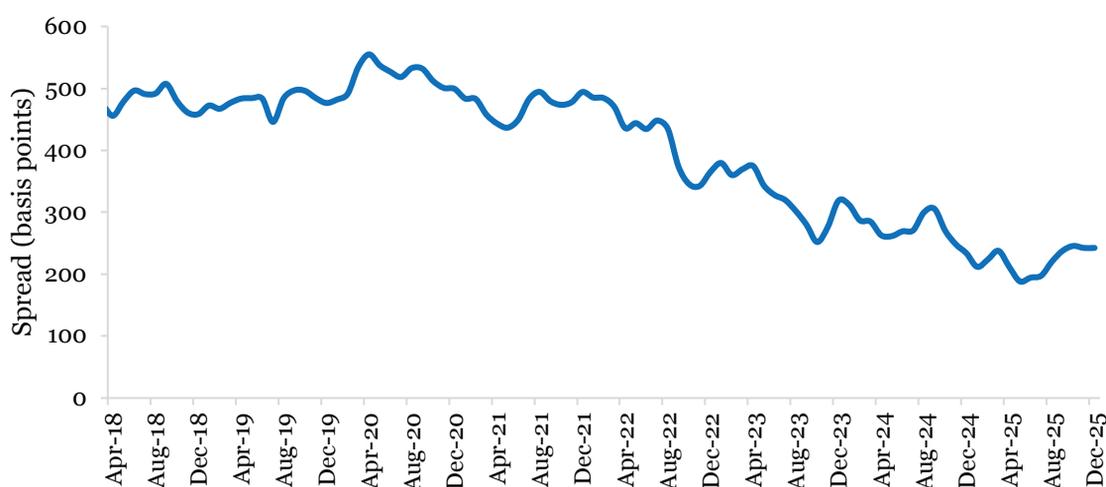
### Supportive fiscal policy strategy underpinning domestic demand

1.30. The momentum in domestic demand and capital formation observed in FY26 has been underpinned by a prudent fiscal policy strategy, characterised by steady revenue mobilisation and calibrated expenditure rationalisation. The gross tax revenue collection has progressed resiliently during the year, with direct tax collections reaching nearly 53 per cent of the budgeted annual target (as on November 2025). Indirect tax collections also remained robust despite lower inflation and import volatility, with gross GST collections in absolute terms recording multiple all-time highs during the

year. Recent tax policy reforms, including the restructuring of personal income tax and the rationalisation of the GST rate, have supported consumption demand while sustaining revenues in absolute terms. On the expenditure side, capital outlays recorded a strong year-over-year increase, reaching nearly 60 per cent of the budgeted allocation by November 2025. Also, the growth in revenue expenditure remained contained, reinforcing the quality of public spending.

1.31. The central government's fiscal trajectory stands out for combining consolidation with sustained public investment, earning three sovereign rating upgrades this year. Between FY20 and FY25 (Provisional Actual), the share of capital spending in total central government expenditure increased from about 12.5 per cent to 22.6 per cent, while effective capex as a share of GDP rose from roughly 2.6 per cent to 4.0 per cent. Even as the states are overshooting their revenue deficit, the central government, through its Special Assistance to States for Capital Expenditure/Investment (SASCI), has successfully incentivised the States to maintain capital expenditure at around 2.4 per cent of GDP. The expansion of unconditional cash transfers across several States has contributed to rising revenue expenditure, with implications for fiscal space and public investment at the state level (See Chapter II). Based on the broad trends observed during the year, the central government remains well on track to achieve its envisaged fiscal consolidation path, aiming to attain a fiscal deficit target of 4.4 per cent of GDP by FY26. As of November 2025, the union government's fiscal deficit stood at 62.3 per cent of the Budget Estimates.

**Chart I.22: Declining sovereign 10-yr yield spread over US bonds indicates lower risk premium**



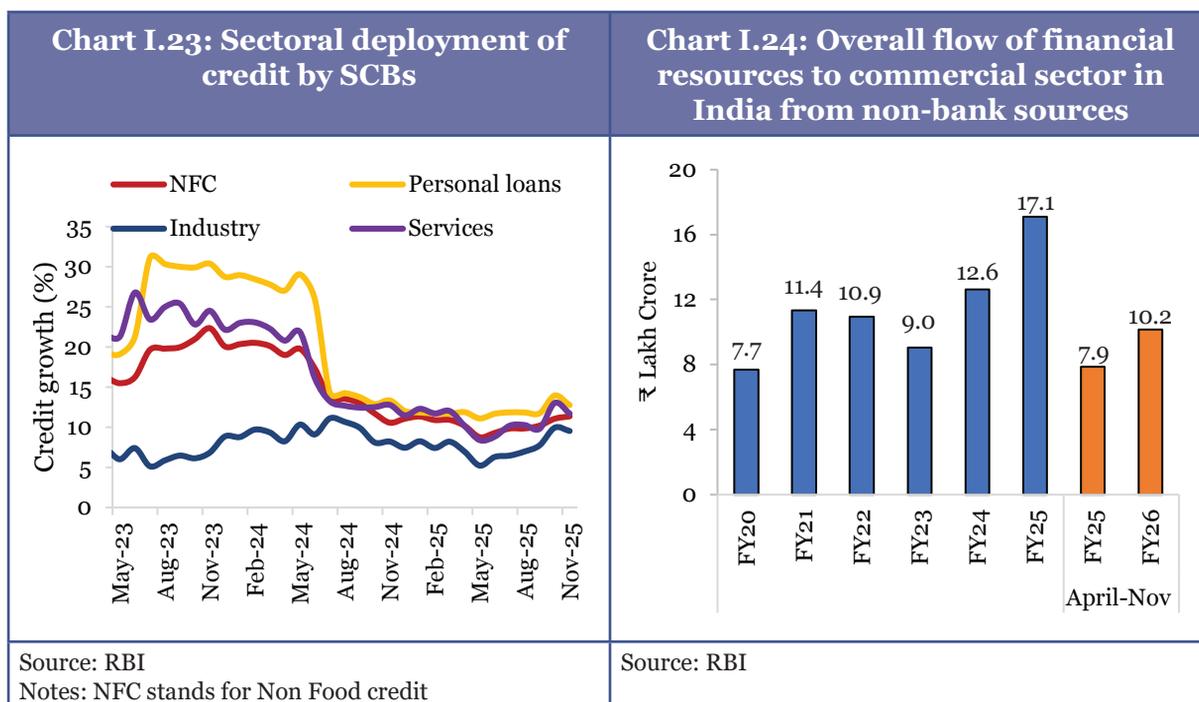
Source: RBI, Bloomberg

1.32. Markets have acknowledged and rewarded the government's commitment to fiscal discipline through lower sovereign bond yields, with the spread over U.S. bonds declining by more than half (Chart I.22). Alongside a lower repo rate, these declining

yields, which serve as benchmarks for borrowing costs across the economy, will itself act as a fiscal stimulus. Credit ratings agency, S&P Ratings, has acknowledged the credibility of and the commitment to the fiscal glide path, while upgrading India’s rating from ‘BBB-’ to ‘BBB’. CareEdge Global, in initiating its coverage of India, too assigned a ‘BBB+’ rating, underscoring India’s robust economic performance and fiscal discipline.

### Monetary Transmission and the Changing Credit Mix

1.33. Alongside the fiscal stimulus provided by higher public capital expenditure and tax reductions, monetary support was delivered through a cumulative reduction of 125 basis points in the policy repo rate since February 2025 (as inflationary pressures moderated), complemented by an injection of durable liquidity via cash reserve ratio cuts (₹ 2.5 lakh crore<sup>25</sup>), open market operations (₹6.95 lakh crore<sup>26</sup>) and forex swap of around \$25 billion. These measures have been effectively transmitted to the banking system. The weighted average lending rate (WALR) on fresh Rupee loans by scheduled commercial banks declined by 59 basis points (bps), while the WALR on outstanding Rupee loans declined by 69 bps between February and November 2025. Concurrently, the banking sector has further strengthened its balance sheets, with gross non-performing asset (NPA) ratios declining to multi-decade lows of 2.2 per cent, the half-yearly slippage ratio<sup>27</sup> remaining stable at 0.7 per cent, and profitability improving, supported by higher profit after tax and robust net interest margins.



25 Reserve Bank of India. (2025, June 6). Governor’s statement: June 6, 2025 (Press Release, PRID No. 60605). Reserve Bank of India. (<https://tinyurl.com/2s4jv2je>)

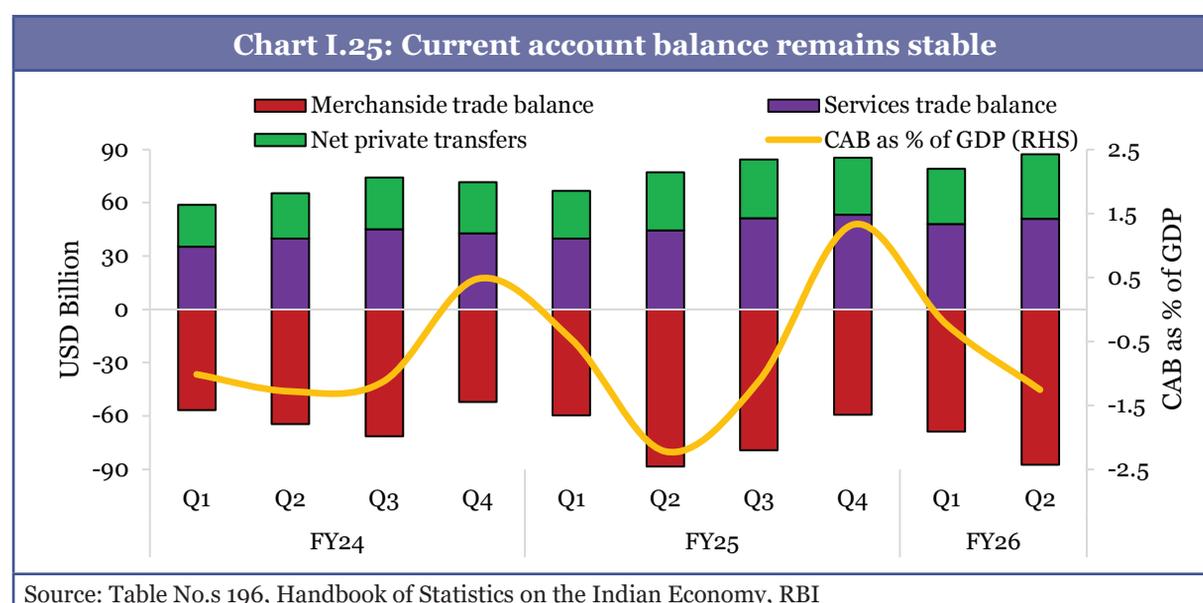
26 Data from Feb 2025- upto 6 Jan 2026

27 which measures new accretions to NPAs as a share of standard advances at the beginning of the period

1.34. While YoY growth of outstanding non-food credit stands at a reasonably stable rate of around 11.4 per cent as of November 2025 (Chart I.23), India's commercial sector is tapping into alternative sources of financing, thereby offsetting any moderation in bank credit. The faster transmission of monetary policy has enabled market-based financial instruments to serve as a viable funding source for large corporations. Additionally, as the profitability of these corporations has grown over time, their internal resources have become available for business growth. Together, these trends have decreased their reliance on bank credit. In April–November 2025, within the overall flow of financial resources, there has been a significant increase in the flow from non-bank sources, (Chart I.24) which rose by 29.3 per cent YoY, alongside a robust expansion in non-food bank credit of 18.3 per cent (YoY).

### External sector projected to be stable, but headwinds persist

1.35. Against a backdrop of global trade uncertainty, India's total exports (merchandise and services) reached a record USD 825.3 billion in FY25, with continued momentum in FY26. Despite heightened tariffs imposed by the United States, merchandise exports grew by 2.4 per cent (April–December 2025), while services exports increased by 6.5 per cent. Merchandise imports for April–December 2025 increased by 5.9 per cent. Following the trends in previous years, the rise in merchandise trade deficit has been counterbalanced by an increase in services trade surplus, while the growth in remittances has bolstered this balance (Chart I.25). In most years, remittances have surpassed gross FDI inflows, underscoring their importance as a key source of external funding. As a result, the current account deficit remains moderate at 0.8 per cent of GDP in H1 FY26.



1.36. Within the capital account, gross FDI inflows continued to rise significantly, growing by 16.1 per cent YoY in April–November 2025. While repatriation flows have

marginally declined by 4.2 per cent, an increase in FDI by India abroad of 34.9 per cent over this period capped the growth in net FDI.<sup>28</sup> Moreover, foreign portfolio investments have experienced fluctuations, with three months of sizable net inflows and six months of net outflows from April to December 2025, resulting in a modest net outflow of USD 3.9 billion as of December 2025, compared to net inflows of USD 10.6 billion in the corresponding period of the previous year. FPI flows this year have been tepid due to elevated uncertainty and increased interest in AI-related financial investments in countries such as the US, Taiwan, and Korea. As a result, there was a balance of payments (BOP) deficit of USD 6.4 billion in H1 FY26 compared to a surplus of USD 23.8 billion in H1 FY25, which was funded by a decline in foreign exchange (forex) reserves.

1.37. This widened BOP deficit, coupled with market uncertainty over the outcome of a trade deal with the US, has exerted pressure on the Indian Rupee, causing it to weaken. Between April 1 and January 22, 2026, the Indian rupee depreciated by approximately 6.5 per cent against the US dollar. However, the movement in the INR has been orderly. Over the medium to long term, exchange rate dynamics are expected to be guided by structural fundamentals, such as productivity gains, export diversification towards higher-value goods and services, deeper integration into GVCs and a stable policy environment rather than short-term fluctuations.

1.38. India's external sector is placed comfortably in the short run. Forex reserves cover over 11 months of imports as of 16 January 2026 and approximately 94.0 per cent of the external debt outstanding as of the end of September 2025, offering a comfortable liquidity cushion. The pursuit of a diversified trade strategy, as evidenced by the signing of trade agreements with the UK, Oman, and New Zealand and the EU, and active negotiations with US, bodes well for India's exports. However, global developments are complicating the outlook in the medium term. A proliferation of immigration controls across countries typically favoured by Indian emigrants may cap the growth in remittances. Global trade is being increasingly influenced by geopolitical alignments and economic statecraft, which in turn may impact India's exports. Therefore, it becomes imperative that one of the overarching priorities of India's policies must be to enhance its competitiveness on the global stage and improve its attractiveness as an investment destination. Box IV.3 in Chapter 4, External Sector explores the drivers of success in attracting FDI in countries such as Vietnam and Taiwan, and outlines a way forward.

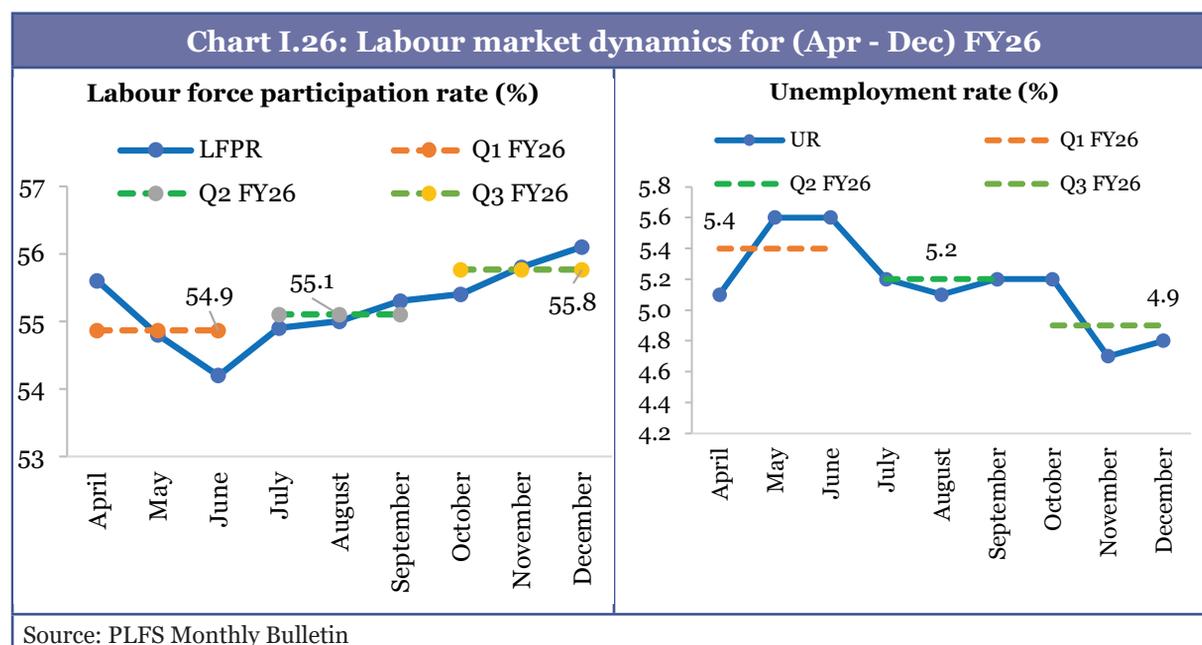
## Labour market developments

1.39. India has witnessed improvements in the labour market, supported by a combination of regulatory reforms, expanded social protection, and targeted

---

<sup>28</sup> Net FDI is defined as Gross FDI inflow net of repatriation and net FDI by India abroad.

skill development initiatives. Recent labour market indicators suggest improving employment conditions supported by ongoing structural reforms. Monthly PLFS data show a broadly steady labour market with seasonal variations (Chart I.26). The quarterly averages of monthly estimates point to a decline in the unemployment rate and a stabilising labour force participation rate.



1.40. The union government's landmark step of notifying the implementation of the Labour Codes marks a significant reform in the regulatory framework. The consolidation of 29 central laws into four Labour Codes aims to simplify compliance, enhance labour market flexibility, and extend security to a broader section of the workforce, while maintaining safeguards for wages, occupational safety, and social security. Importantly, the recognition of the gig and platform workers, with provisions to enable their registration and inclusion within social security schemes, marks a step towards formalising non-traditional forms of employment. Complementing these reforms, government-led skilling initiatives have focused on enhancing employability through industry-aligned training. Together, these measures aim to strengthen labour market resilience, improve job quality, and better align workforce capabilities with the requirements of a rapidly changing economy.

1.41. Social sector initiatives, supported by targeted welfare schemes, economic reforms, and expanded access to essential services, have contributed to a reduction in poverty levels. In June 2025, the World Bank revised the international poverty line from USD 2.15 to USD 3.00 per day (PPP, 2021 prices). Based on the revised poverty line, India's poverty rates in 2022-23 are estimated at 5.3% per cent for extreme poverty and 23.9% per cent for lower-middle-income poverty, noting that these estimates are not directly comparable with earlier poverty lines. Key health and education indicators, such

as life expectancy, the infant mortality rate (IMR), and the gross enrolment ratio (GER), have shown steady improvement, indicating gains in overall health outcomes, maternal and child health, access to education, and human capital formation. The convergence of improved human resource development outcomes and poverty alleviation highlights the role of inclusive growth, sustained social sector investments, and welfare measures in enhancing overall welfare and strengthening the economy's long-term resilience.

## OUTLOOK AND WAY FORWARD

1.42. The FY26 was an unusually challenging year for the economy on the external front. Heightened uncertainty in global trade and the imposition of high, penal tariffs created stress for manufacturers, particularly exporters, and affected business confidence. The government responded by using this crisis as an opportunity to push through key measures such as GST rationalisation, faster progress on deregulation, and further simplification of compliance requirements across sectors. FY27 is therefore expected to be a year of adjustment, as firms and households adapt to these changes, with domestic demand and investment gaining strength. That said, it must be acknowledged that the external environment remains uncertain, which shapes the overall outlook.

1.43. The outlook for the global economy remains dim over the medium-term, with downside risks dominating. At the global level, growth is expected to remain modest, leading to broadly stable commodity price trends. Inflation across economies has trended downward, and monetary policies are therefore expected to become more accommodative and supportive of growth. However, certain key risks persist. If the AI boom fails to deliver the anticipated productivity gains, it could trigger a correction in overly optimistic asset valuations, with the potential for broader financial contagion. Additionally, a protraction of trade conflicts would weigh on investment and further weaken the global growth outlook. These forces collectively suggest that downside risks to global growth remain prominent, although a fragile stability holds for now.

1.44. For India, these global conditions translate into external uncertainties rather than immediate macroeconomic stress. Slower growth in key trading partners, tariff-induced disruptions to trade and volatility in capital flows could intermittently weigh on exports and investor sentiment. At the same time, ongoing trade negotiations with the United States are expected to conclude during the year, which could help reduce uncertainty on the external front. While these risks remain manageable, they reinforce the importance of maintaining adequate buffers and policy credibility.

1.45. Against this backdrop, the domestic economy remains on a stable footing. Inflation has moderated to historically low levels, although some firming is expected to occur going forward. Balance sheets across households, firms and banks are healthier, and public investment continues to support activity. Consumption demand remains

resilient, and private investment intentions are improving. These conditions provide resilience against external shocks and support the continuation of growth momentum. The forthcoming rebasing of the CPI series in the coming year will also have implications for inflation assessment and warrant careful interpretation of price dynamics.

1.46. Importantly, the cumulative impact of policy reforms over recent years appears to have lifted the economy's medium-term growth potential closer to 7 per cent (details in Box I.4). With domestic drivers playing a dominant role and macroeconomic stability well anchored, the balance of risks around growth remains broadly even. Taking these considerations together, the Economic Survey projects real GDP growth in FY27 in the range of 6.8 to 7.2 per cent. The outlook, therefore, is one of steady growth amid global uncertainty, requiring caution, but not pessimism.

#### Box I.4: Reassessing India's Medium-Term Potential Growth

Chapter 2 of the Economic Survey 2022–23 assessed India's medium-term potential growth at around 6.5 per cent, with the possibility of rising to 7–8 per cent conditional on sustained structural reforms. The period since then allows a reassessment of whether the continued cycle of reforms in the economy has begun to strengthen the economy's productive capacity, leading to an upward shift in potential growth. The Box argues that this is indeed the case.

Over the past three years, reform momentum has strengthened across several areas relevant for medium-term growth. Manufacturing-oriented initiatives, such as the Production-Linked Incentive (PLI) schemes, FDI liberalisation, and logistics reforms, have supported capacity creation. These efforts have been supported by sustained public investment in physical and digital infrastructure, with effective capex reaching 4 per cent of GDP. The simplification of tax laws and the establishment of various High-Level Committees for regulatory reforms, including those involving state governments, indicate a shift toward greater regulatory clarity and certainty. Measures targeted at MSMEs, including expanded credit guarantees, wider use of TReDS and the rollout of the Unified Lending Interface (ULI), have sought to ease credit constraints.

These reforms have coincided with stronger corporate and financial sector balance sheets<sup>29</sup>, rising formalisation of employment<sup>30</sup>, and continued improvements in tax administration. Together, these developments make a persuasive case that India's potential growth has risen to around 7 per cent over the medium term. The exercise uses a standard growth accounting framework, where the potential output is assessed with a Cobb–Douglas production function:

$$Y = AK^\alpha L^{1-\alpha} \quad \text{.....(i)}$$

<sup>29</sup> Gross non performing asset has declined from peak of 11.2% in march 2018 to 3.9% in March 2023 and further to 2.2% as of September 2025. Core debt of private non-financial sector i.e., credit to the private non-financial sector as a percentage of GDP in India had come down from a peak of 107.8% in December 2010 to a low of 85.6 % in March 2020.

<sup>30</sup> Monthly net additions in EFPO increased three times in FY26 (upto July) from FY19.

Here,  $Y$  denotes output,  $K$  denotes capital stock,  $L$  is labour input, and  $A$  is total factor productivity (TFP). The parameters  $\alpha$  and  $(1 - \alpha)$  capture the output elasticities of capital and labour. Taking logarithms and expressing in growth rates,

$$\Delta \ln Y = \Delta \ln A + \alpha * \Delta \ln K + (1 - \alpha) * \Delta \ln L \quad \dots(\text{ii})$$

where  $\Delta \ln Y$ ,  $\Delta \ln K$  and  $\Delta \ln L$  denote growth rates of output, capital stock and labour input, respectively, and  $\Delta \ln A$  represents growth in total factor productivity (TFP).

Using the above framework, this assessment examines whether each input component exhibits a higher sustainable trend reflecting the potential impact of reforms undertaken post-pandemic, along with an improvement in macro-financial fundamentals. The assumptions regarding capital stock growth, labour input growth, and growth in trend TFP used in the analysis are summarised in Table I.7. These assumptions are based on trends in data from National Accounts Statistics, Periodic Labour Force Survey (PLFS), and RBI's KLEMS database.

### 1. Capital stock growth highlights investment revival and capacity expansion

India's capital stock grew at an average annual rate of about 8.6 per cent during the investment boom of FY03–FY12. However, growth moderated to around 7.6 per cent during FY13–FY20, reflecting balance sheet stress in the corporate and banking sectors, which weighed on investment and capital formation. The pandemic accentuated these constraints, resulting in a further slowdown in capital stock growth, followed by a recovery in the years after the pandemic. (Table I.7).

The recovery has been supported by a sustained increase in public capital expenditure<sup>31</sup>, alongside improved investment capacity in the private sector. Compared to earlier episodes, the recent public capex push differs in two important respects. First, it has been sustained rather than episodic. Second, it has been accompanied by logistics, digital and regulatory reforms that improve the productivity of capital.

International evidence suggests that sustained public infrastructure investment can increase potential output by attracting private investment, particularly when financial sector balance sheets are healthy (IMF, 2020<sup>32</sup>; World Bank, 2023<sup>33</sup>). Consistent with this, private investment intentions have shown signs of revival, as reflected in capacity utilisation surveys and new project announcements.<sup>34</sup>

31 Between FY20 and FY25, the share of capital spending in total central government expenditure increased from about 12.5% to 22.6% (PA), while effective capex as a share of GDP rose from roughly 2.6% to 4.0%. In absolute numbers, the centre's capex outlay has more than tripled — from around ₹3.4 lakh crore to ₹10.5 lakh crore (PA) during the same period.

32 International Monetary Fund. (2020). Public Investment for the Recovery. Fiscal Monitor, October 2020. Washington, DC. (<https://tinyurl.com/ry8fmba4>)

33 World Bank. (2023). Global Economic Prospects: January 2023. Washington, DC. (<https://tinyurl.com/bdv5e4yr>)

34 Paragraph no I.13 and table I.4, footnote no. 13.

Looking ahead, as post-pandemic uncertainty continues to ease, capital stock growth is expected to return to at least its pre-COVID average. This assumption incorporates a modest and conservative upward adjustment relative to recent years, reflecting improved capital efficiency and gradual crowd-in effects from sustained public investment and ongoing reforms.

The capital share ( $\alpha$ ) is assumed at 0.49. This aligns with the average capital share reported in the pre-pandemic period in the KLEMS database.

## **2. Labour input: Increased participation, formalisation and employability gains**

The pre-pandemic period (FY13–FY20) was characterised by relatively stable participation rates, with labour input growing at an average of about 2.3 per cent, based on KLEMS estimates.<sup>35</sup>

The availability of PLFS data from 2017-18 onwards provides additional insights into labour market dynamics. The data points to rising participation rates, particularly among women, alongside increasing formalisation and social security coverage. However, since the pandemic, labour input growth<sup>36</sup> has displayed volatility and unusual spikes. These movements reflect a combination of temporary labour market disruptions during the pandemic and accelerated formalisation during the recovery phase.

As economic activity normalised, labour market reforms gained traction. Labour law consolidation, reduced regulatory compliance and State-level regulatory reforms have begun to lower frictions in the labour market. At the same time, sustained investments in education, skilling and the apprenticeship ecosystem are strengthening workforce quality and employability. Taken together, these factors are likely to support a stabilisation of labour input growth over the medium term, at a level higher than pre-pandemic period.

## **3. Trend TFP: digital infrastructure and allocative efficiency**

Trend TFP captures efficiency gains from better use of capital and labour. Using the capital stock and labour growth assumptions outlined above, the estimated trend TFP growth averaged around 1.9 per cent during the pre-pandemic period (FY13–FY20; refer to notes in the table below). However, in the immediate post-pandemic years, the estimated trend of TFP growth appears lower (Table 1.7). This pattern is consistent with developments observed across several emerging market economies, as documented in the Conference Board's Total Economy Database.<sup>37</sup>

Looking ahead, sustained reform momentum is expected to support a strengthening of trend TFP. Economy-wide adoption of public digital infrastructure, including Aadhaar, UPI and GSTN, has reduced transaction and compliance costs. Settlement cycles have shortened, and tax compliance has improved. Firm entry and exit have become easier, thereby improving allocative efficiency by allowing capital to move toward more productive activities.

<sup>35</sup> KLEMS data are used to maintain consistency in employment measurement over the extended historical period, including years prior to 2017–18.

<sup>36</sup> Labour growth estimated using LFPR from PLFS, and population projections from Ministry of Health and Family Welfare

<sup>37</sup> The Conference Board. (2024, May). Total Economy Database. (<https://tinyurl.com/42y8u8ts>)

Complementary reforms in physical infrastructure, logistics, insolvency resolution and regulatory simplification reinforce these digital gains. Together, these measures reduce coordination failures and lower the cost of scaling up production. At the same time, investments in education, skilling and apprenticeship frameworks support labour productivity. Rising formalisation improves labour market functioning and skill utilisation over time.

Together, these reforms enable higher output to be generated from a given set of factor inputs. While early gains were visible in financial inclusion, improved compliance, and service delivery, deeper productivity effects tend to materialise with a lag. Accordingly, the medium-term assessment assumes that trend TFP growth gradually improves and stabilises at a level same as the pre-pandemic average.

**Table I.7: Growth Accounting Assumptions and Implied Growth**

Component	Pre-pandemic (FY13 -FY20)	FY23	FY24	FY25 (Est.)	FY26 -FY30 (Est)
Capital stock growth (%)*	7.6	6.1	6.9	7.1	7.6
Capital share ( $\alpha$ )#	0.49	0.48	0.48	0.48	0.49
Labour input growth (%)\$	2.3	5.7	5.5	4.0	2.6
Labour share ( $1-\alpha$ )#	0.51	0.52	0.52	0.52	0.51
Trend TFP growth (%)@	1.9	1.7	1.7	1.7	1.9
Output growth (%)	-	-	-	-	7.0

Source:

\* National Accounts Statistics, MoSPI

\$ Periodic Labour Force Survey (PLFS), data from FY13-FY20 is taken from KLEMS, and FY23-FY25 is calculated using PLFS data.

# RBI's KLEMS database

@ TFP growth is obtained as a residual from equation (ii) above, given the values of Y, K, L,  $\alpha$ . The trend TFP growth is then estimated after smoothing the impact of covid disruptions in FY20-FY22.

### Higher growth frontier

When combined, these calibrated improvements in capital accumulation, labour input and trend TFP generate an upward shift in potential GDP growth from 6.5 per cent to around 7 per cent over the medium term. This reflects the compounding effect of sustained reforms interacting with strong macro-financial fundamentals. This assessment is buttressed by the higher growth trends observed in high-frequency indicators in recent years. Growth in e-way bill generation, PMI indices and non-food bank credit has remained persistently above their respective pre-pandemic averages, rather than reverting to previous growth trends. This performance suggests a more robust underlying pace of economic activity and an improved growth momentum.

International experience from East Asia in the 1990s to parts of Eastern Europe following EU accession suggests that such step-ups in potential growth are most credible when reforms are persistent rather than episodic, and when macroeconomic stability is maintained (World

Bank, 2008<sup>38</sup>; IMF, 2015<sup>39</sup>). Domestically, India fulfils both these conditions. However, exogenous shocks in the form of geopolitical conflicts and their economic fallout can, at times, prevent the economy from growing at its potential. Continued implementation and coordination across the Centre and States will be critical for sustaining this higher growth frontier and moving it even higher.

---

38 World Bank. (2008). The Growth Report: Strategies for Sustained Growth and Inclusive Development. Commission on Growth and Development. Washington, DC. (<https://tinyurl.com/ms46vt7n>)

39 International Monetary Fund. (2015). Where Are We Headed? Perspectives on Potential Output. World Economic Outlook, April 2015, Chapter 3. Washington, DC. (<https://www.elibrary.imf.org/display/book/9781498378000/ch003.xml>)

*This page has been left blank*

# FISCAL DEVELOPMENTS: ANCHORING STABILITY THROUGH CREDIBLE CONSOLIDATION



*At a time when public debt remains elevated globally, and fiscal space is under strain across countries, the Central Government's fiscal trajectory stands out for combining consolidation with sustained public investment. The government's calibrated fiscal strategy, anchored in credible deficit reduction, resilient revenue mobilisation, and a decisive reorientation of spending toward capital formation, has strengthened macroeconomic stability and supported growth in the post-pandemic period. Importantly, this fiscal resilience reflects prudent fiscal policy choices and careful fiscal management.*

*The Centre's revenue receipts strengthened significantly, rising from an average of about 8.5 per cent of GDP in the pre-pandemic period (FY16-FY20) to around 9.1 per cent in the post-pandemic years (FY22-FY25). This improvement was driven primarily by buoyant direct tax collections, supported by tax reforms, technology-enabled compliance, deeper formalisation, and improved corporate profitability. Among indirect taxes, GST collections have recorded multiple all-time highs in absolute terms during FY26, with growth broadly aligned to nominal GDP. The recent GST rate rationalisation reforms are expected to support demand by lowering tax incidence and improving price competitiveness, with volume and compliance effects helping to maintain revenue resilience. High-frequency indicators, such as e-way bill generation, PMI readings, automobile sales, UPI transactions, and tractor sales, point to strengthening economic momentum in the recent months following these reforms.*

*On the expenditure side, consolidation has been achieved alongside an improvement in expenditure quality. Revenue expenditure moderated from 13.6 per cent of GDP in FY22 to 10.9 per cent in FY25, creating space for productive capital outlays. Capital expenditure was scaled up from an average of 1.7 per cent of GDP in the pre-pandemic period to approximately 3 per cent in the years following the pandemic, with effective capital expenditure reaching 4 per cent of GDP in FY25. This rebalancing was supported by subsidy rationalisation reduced leakages from Direct Benefit Transfers, and other public financial management reforms, such as Just-in-Time fund releases. As a result, fiscal indicators remain on track in FY26, indicating adherence to the budgeted consolidation path.*

*The Central Government, through its Special Assistance to States for Capital*

*Expenditure/Investment (SASCI), has successfully incentivised the States to maintain capital expenditure at around 2.4 per cent of GDP in FY25. Further, the emerging fiscal trade-offs at the State level, particularly the rapid expansion of unconditional cash transfers, have been highlighted. While these provide immediate income support, their growing scale risks increasing expenditure rigidity and crowding out resources for capital investments, including human-capital.*

*Finally, the chapter demonstrates that, unlike many peer economies where post-pandemic debt unwinding has been limited, India has reduced its general government debt-to-GDP ratio by approximately 7.1 percentage points since 2020, while sustaining high public investment. Going forward, the Central Government's credible medium-term goal to converge towards a debt-to-GDP ratio of  $50 \pm 1$  per cent provides the policy anchor for sustaining this consolidation at the general government level as well.*

*The chapter also offers certain reform suggestions for reducing cross-subsidies, stabilising the pipeline for equity monetisation by revising the definition of government companies, advancing the trust and nudge theory in e-way billing, and reaping efficiencies in spending.*

## INTRODUCTION

2.1 A key development for the Indian economy in 2025 was the recognition of its fiscal resilience by global rating agencies, reflected in three sovereign credit rating upgrades by Morningstar DBRS, S&P Global Ratings, and Rating and Investment Information, Inc. (R&I). These upgrades were attributed to India's prudent fiscal management supported by continued deficit reduction, improved revenue buoyancy, and a clear shift in public spending toward growth-enhancing capital investment. Rating agencies also highlighted improved fiscal transparency and a credible medium-term consolidation path as factors that strengthen debt dynamics and reinforce confidence in India's macroeconomic and fiscal framework.

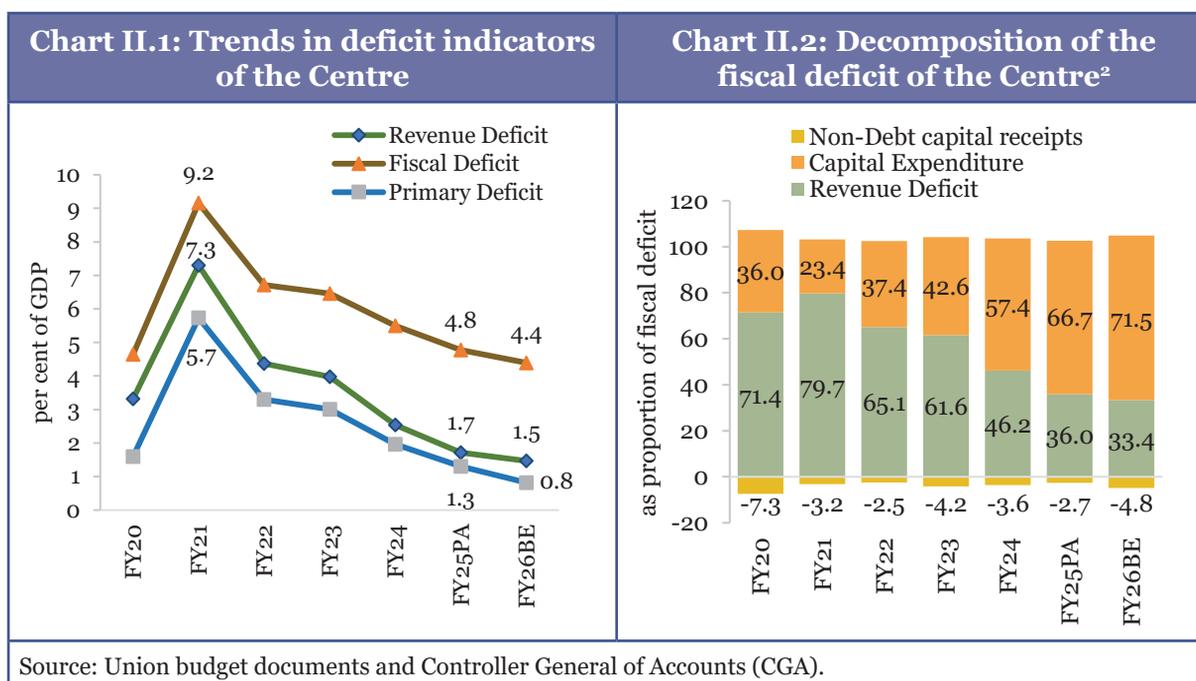
2.2 It is noteworthy that this fiscal resilience has been the outcome of deliberate and sustained policy effort rather than a natural and easy progression. At a time of elevated expenditure pressures and uncertainty around revenue streams, articulating a medium-term consolidation path and adhering to it required strong policy commitment. This chapter examines the fiscal policy choices made over the recent years that have strengthened the fiscal capacity of the Central Government while also encouraging healthier fiscal practices among the States. It begins with an assessment of the fiscal performance of the Centre and the States, followed by an analysis of government debt and the consolidated general government position, and concludes with an assessment of the fiscal outlook.

## CENTRAL GOVERNMENT FINANCES

### Fiscal policy as a key anchor of macroeconomic stability and confidence

2.3 A predictable and credible fiscal trajectory by the Centre over the past years has anchored overall macroeconomic stability by balancing growth imperatives with fiscal sustainability. The Central government's fiscal consolidation experience underscores the value of clearly defined fiscal targets alongside retained flexibility, thereby allowing fiscal policy to support rather than constrain growth during periods of uncertainty. In this context, the Union Budget for FY22 articulated a medium-term glide path, targeting a fiscal deficit below 4.5 per cent of GDP by FY26, instead of binding annual targets, to ensure that growth-enhancing expenditure, particularly capex, was not compromised.

2.4 Accordingly, the fiscal deficit declined from 9.2 per cent of GDP in FY21 to 4.8 per cent of GDP in FY25 [Provisional Accounts, (PA)] and is budgeted at 4.4 per cent of GDP in FY26 (Chart II.1). Over the same period, the revenue deficit as a proportion of GDP has narrowed steadily, reaching its lowest level since FY09, thereby leaving a greater allocation for capex (Chart II.2) and reflecting a sustained improvement in the quality of expenditure. The decline in the primary deficit-to-GDP ratio<sup>1</sup> during this period (Chart II.1), further indicates that fresh borrowings are now increasingly being used to service past interest obligations rather than to finance current spending.



1 Primary Deficit (PD) = Fiscal Deficit (FD) – Interest Payments; A zero primary deficit means the government's current revenues are sufficient to meet its non-interest expenditure; borrowing is only to service past debt.

2 Fiscal Deficit = Total Expenditure – Total Non-Debt Receipts  
 = (Revenue Expenditure + Capital Expenditure) – (Revenue Receipts + Non-Debt Capital Receipts)  
 = (Revenue Expenditure – Revenue Receipts) + Capital Expenditure – Non-Debt Capital Receipts  
 = Revenue Deficit + Capital Expenditure – Non-Debt Capital Receipts.

## Sustained revenue buoyancy supports consolidation

2.5 In an environment of heightened global volatility, government revenues have strengthened fiscal capacity, allowing expenditure needs to be met while following a consolidation path. An assessment of the Central Government's receipts, comprising revenue receipts (net tax to Centre and non-tax revenues) and non-debt capital receipts, provides insight into the sources of this resilience.

2.6 Revenue receipts increased from an average of about 8.5 per cent of GDP during the pre-pandemic period (FY16-FY20) to around 9.1 per cent of GDP in the post-pandemic period (FY22-FY25 PA).<sup>3</sup> This improvement was driven primarily by higher gross tax revenue, which rose from an average of 10.8 per cent of GDP to about 11.5 per cent of GDP over the same period. The buoyancy of revenues reflects both the strong growth momentum of the domestic economy and the cumulative impact of tax policy and tax administration reforms implemented by the Government. Within the overall stable tax revenues, the performance of individual tax components reveals notable shifts in the composition and sources of revenue growth.

### Broadening of the Direct Tax Base

2.7 The share of direct taxes in total taxes<sup>4</sup> has increased in the past years, from 51.9 per cent in the pre-pandemic period to 55.5 per cent in the post-pandemic years, reaching 58.8 per cent in FY25(PA). Table II.1 shows the trends in the components of direct taxes. Among these, the non-corporate tax collections<sup>5</sup> have recorded a strong performance, with collections increasing from an average of about 2.4 per cent of GDP in the pre-pandemic period to around 3.3 per cent of GDP in the post-pandemic period. Even within the post-pandemic years, these collections rose from 3 per cent of GDP in FY22 to about 3.7 per cent of GDP in FY25(PA). This momentum is also reflected in the strong average buoyancy<sup>6</sup> of 1.8 observed in non-corporate taxes during FY23 to FY25(PA)<sup>7</sup>, implying that collections grew faster than nominal GDP.

3 Throughout the chapter FY16-FY20 is taken as pre-pandemic period, and FY22-FY25 is taken as the post-pandemic period.

4 Share of major direct taxes (i.e., Corporate tax + Taxes on income other than Corporate tax) in the total of major direct and indirect taxes (i.e., Corporate tax+ Taxes on income other than Corporate tax + Customs+ Excise+ GST + Service tax).

5 Taxes on income other than Corporation tax, as reported in the Budget are being termed as Non-corporate tax in the chapter. This includes personal income tax collections, various cesses and surcharges, as well as securities transaction tax (STT).

6 Tax buoyancy measures how responsive tax revenues are to changes in overall economic activity, typically GDP. It is measured as follows: Tax Buoyancy = per cent change in tax revenue (non-adjusted for policy or rate changes) ÷ per cent change in GDP. Buoyancy value >1 implies that Tax revenue grows faster than GDP.

7 Since the data in post post-pandemic period is taken for FY22-FY25, the growth rates/buoyancies during the period are reported for FY23-FY25 (Growth in FY22 was distorted due to a low base in FY21).

**Table II.1: Trends in the components of direct taxes (₹ lakh crore)**

	FY22	FY23	FY24	FY25 RE	FY26 BE
Gross Tax Revenue, of which	27.09	30.54	34.66	38.53	42.70
Corporate Tax	7.12	8.26	9.11	9.80	10.82
Non-Corporate Tax (Taxes on Income)	6.96	8.34	10.45	12.57	14.38
<i>of which</i>					
Personal Income Tax	6.69	8.04	10.07	11.99	13.57
Security Transaction Tax	0.23	0.25	0.34	0.55	0.78
Others	0.04	0.05	0.04	0.03	0.03
Nominal GDP	235.97	268.90	301.23	330.68	357.14

Source: Union Budget documents and MoSPI.

Note: Corporate Tax and Personal Income Tax include surcharges and cesses.

2.8 This improvement has been supported by a steady expansion of the tax base. The number of income tax returns filed increased in the post-pandemic period, from 6.9 crore in FY22 to 9.2 crore in FY25<sup>8</sup>, reflecting gains from improved compliance, wider use of technology in tax administration, and a growing number of individuals entering the tax net as their incomes rise. Nudge-based interventions have emerged as a powerful tool for improving tax compliance and enhancing the efficiency of tax administration in India (See Box II.1).

### Box II.1: Nudging Compliance: How Data-Driven Behavioural Interventions Transformed Tax Collection Efficiency in India

Anchored in behavioural economics, the NUDGE (*Non-intrusive Usage of Data to Guide and Enable*) approach adopted by the Income Tax Department, focuses on influencing taxpayer behaviour through timely information, gentle prompts, and data-driven insights rather than coercive enforcement. At its core, the NUDGE framework leverages large-scale data analytics to identify potential non-compliance, guide taxpayers with relevant information, and empower them to voluntarily correct or update their filings, without resorting to audits or litigation.

For instance, the Foreign Asset Campaign prompted nearly 25,000 taxpayers to revise their returns, with over 61 per cent responding positively to nudges. This resulted in the declaration of foreign assets worth over ₹29,000 crore and foreign income exceeding ₹1,000 crore, a significant portion of which was through belated returns. Similarly, nudges related to deductions under Section 80GGC led to a large-scale correction of claims, with over 91,000 taxpayers filing updated returns, a reduction of excessive deductions by nearly ₹2,050 crore, and additional tax payments of over ₹680 crore. Similarly, targeted nudges led to a reduction in incorrect House Rent Allowance (HRA) claims, resulting in additional tax collections of over ₹119 crore.

<sup>8</sup> <https://www.pib.gov.in/PressNoteDetails.aspx?id=154926>.

Data-driven nudges also improved third-party reporting and accuracy in TDS filings. More than 8,500 deductors revised their TDS returns, adding over 1.08 crore deductees and bringing additional TDS of nearly ₹4,825 crore into the system. The tool also helped to identify non-genuine agricultural income of ₹2,038.02 crore from 310 entities and capital gains of ₹33,057.28 crore earned through Offer for Sale (OFS) by promoters during Initial Public Offers.

Overall, the NUDGE initiative has improved tax collection efficiency by shifting the focus from post-facto enforcement to preventive, technology-enabled compliance. It has reduced friction, litigation, and compliance costs for both taxpayers and the administration, while increasing revenue through voluntary means. By combining data, behavioural insights, and transparent communication, nudge-based tax administration represents a modern, efficient, and citizen-centric approach to revenue mobilisation.

2.9 Corporate tax collections also recorded an average buoyancy close to unity during FY23-FY25, broadly in line with nominal GDP growth. This reflects the resilience and recovery of the private corporate sector in the post-pandemic period. According to the Reserve Bank of India, aggregate corporate profits of listed companies have increased from around ₹2.5 trillion in FY21 to ₹7.1 trillion in FY25, resulting in a more than 100 per cent increase in corporate tax collections over this period.<sup>9</sup>

2.10 During the current fiscal year, the major direct taxes<sup>10</sup> reached nearly 53 per cent of the Budget estimates as of November 2025, as against 56.6 per cent during the corresponding period of the previous year. Personal income tax collections grew by 6.8 per cent YoY, and corporation tax collections increased by 7.8 per cent YoY during the period, reflecting the various tax concessions granted during this time. The Union Budget 2025-26 ushered in significant income-tax relief for the middle class, with no personal income tax payable for income<sup>11</sup> upto ₹12 lakh (₹12.75 lakh for salaried taxpayers) alongside changes in slabs and rates as well as in TDS rules. The new Income Tax Act, 2025, which focuses on simplification, structural clarity, and continuity of tax policy, was enacted on August 21, 2025, and is slated to take effect from the tax year 2026-27.

### **Excise and Customs Duties: Supporting growth through rate rationalisation**

2.11 Among major indirect taxes, excise duty collections moderated in the post-pandemic period, declining from about 1.7 per cent of GDP in FY22 to around 0.9 per cent of GDP in FY25. This moderation was driven by reductions in excise duty rates on petroleum products in 2021 and 2022, along with relatively moderate growth in petrol and diesel consumption during FY24 and FY25.

<sup>9</sup> From ₹4.58 lakh crore in FY21 to ₹9.80 lakh crore in FY25.

<sup>10</sup> See footnote 4.

<sup>11</sup> other than special rate income such as capital gains.

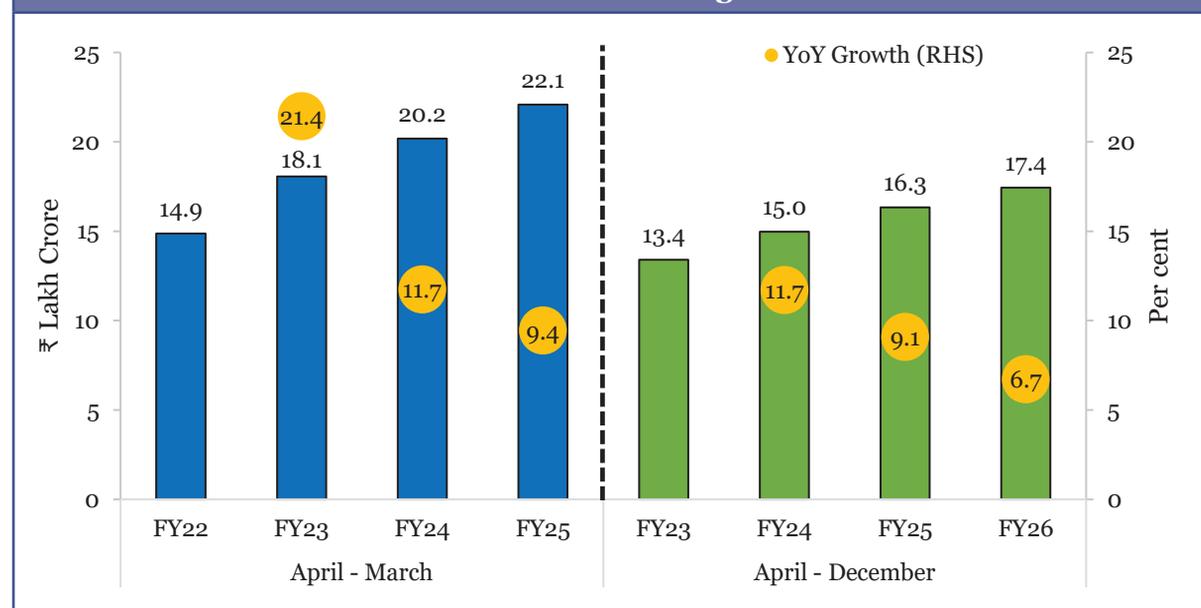
2.12 At the same time, the moderate buoyancy of 0.4 in customs duty collections during the post-pandemic period reflects calibrated reductions in basic customs duties on raw materials and essential goods aimed at supporting domestic manufacturing and containing input costs. This trend was further reinforced by softer global commodity prices, including crude oil, as taxes levied on an ad valorem basis move in line with prices.

2.13 During the current fiscal year, both excise duty and custom duty collections have reached about 60 per cent of their respective Budget estimates as of the end of November 2025, as against 55 per cent and 65 per cent, respectively, during the corresponding period of the previous year. While the excise duty collections witnessed a growth of 9.3 per cent, the customs collections have reduced by 7.3 per cent on a YoY basis.

### Goods and Services Tax: Revenue stability amid ongoing reform

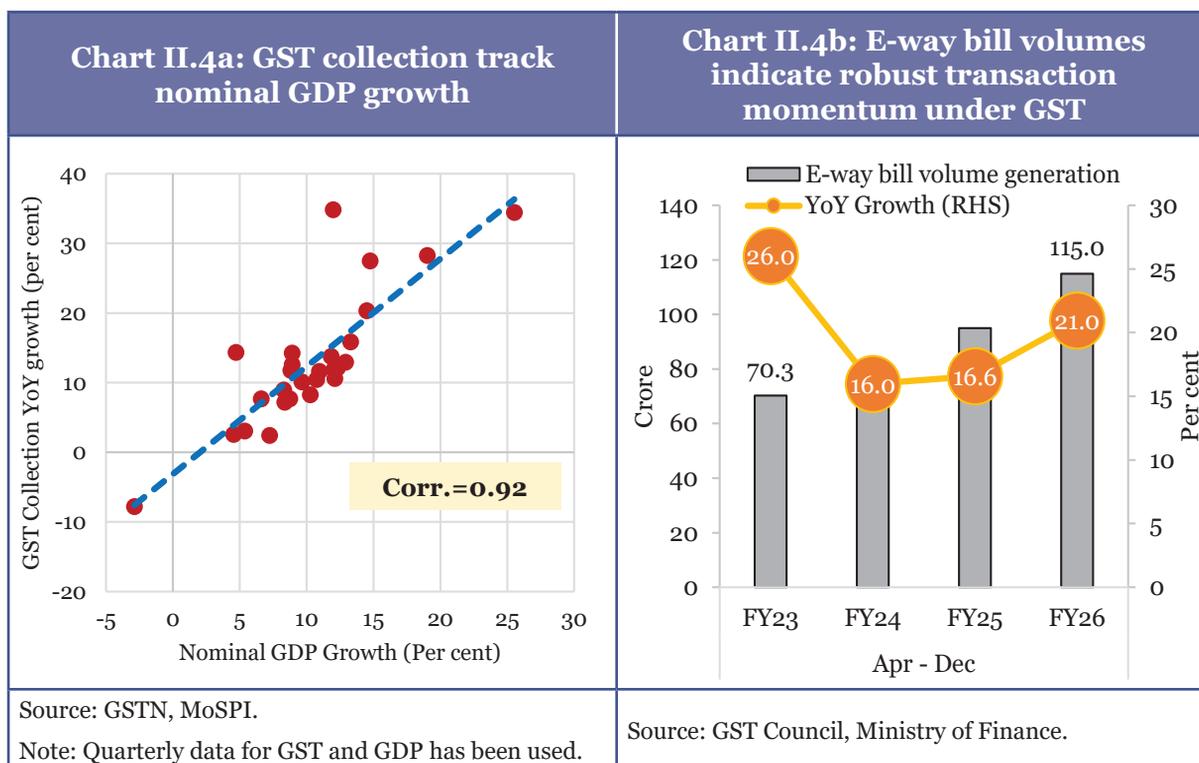
2.14 The Goods and Services Tax (GST) has played a stabilising role by strengthening Government revenues, deepening formalisation, and reinforcing the Government's reform intent. Gross GST revenue during April-December 2025 stood at ₹17.4 lakh crore, recording a YoY growth of 6.7 per cent (Chart II.3). The GST revenue growth has broadly aligned with the prevailing nominal GDP growth conditions, thus influenced in part by lower inflation (Chart II.4a). As a result, while growth rates appear lower in percentage terms, collections in absolute terms have recorded multiple all-time highs during the current fiscal year.

**Chart II.3: Gross GST collections reach all-time highs, even as the growth tracks nominal GDP growth**



Source: Ministry of Finance.

2.15 The underlying strength of GST revenues is reflected in the steady expansion of the tax base, with registered taxpayers increasing from about 60 lakh in 2017 to over 1.5 crore at present, indicating deeper formalisation of economic activity. In parallel, high-frequency indicators suggest robust transaction volumes, with cumulative e-way bill volumes during April-December 2025 growing by 21 per cent YoY (Chart II.4b).



2.16 Looking ahead, the recent rationalisation of GST rates is expected to support demand by lowering tax incidence and improving price competitiveness. Since the lower rates are expected to stimulate higher consumption volumes and strengthen compliance, volume effects could offset the impact of rate reductions on revenues. Accordingly, GST collections are expected to remain resilient in the coming quarters. The expected channels of impact of these measures are discussed in Box II.2.

**Box II.2: Expected channels of impact of GST 2.0 reforms**

The 56th meeting of the GST Council has brought in a two-rate structure with a Standard Rate of 18 per cent, a Merit Rate of 5 per cent and a special de-merit rate or sin-good rate of 40 per cent for a select few goods and services (but inclusive of earlier compensation cess rate, and hence with no increase in overall tax burden). The rationalisation of GST with effect from 22.09.2025 came as the third leg of the tripod of tax reforms, following the corporate tax reductions of 2019 and personal income tax reforms w.e.f. April 2025.

Key Changes introduced in GST 2.0	
Agriculture and related items	<ul style="list-style-type: none"> <li>• GST on agricultural goods (tractors, agricultural, horticultural or forestry machinery etc.) lowered to 5 per cent from 12 per cent.</li> <li>• GST rates on key fertiliser inputs such as Sulphuric acid, Nitric acid and Ammonia slashed to 5 per cent from 18 per cent.</li> </ul>
Auto & Auto Parts	<ul style="list-style-type: none"> <li>• GST on small cars, motorcycles (350cc &amp; below) and three-wheelers is reduced to 18 per cent from 28 per cent. GST on buses, trucks and ambulances is reduced to 18 per cent from 28 per cent.</li> <li>• Uniform 18 per cent GST rate on all auto parts irrespective of their HS code.</li> <li>• Motorcycles (&gt;350cc) and cars outside small cars definition have been moved to the 40 per cent slab. However, cess imposed on luxury cars has been removed.</li> </ul>
Electronic Appliances	<ul style="list-style-type: none"> <li>• ACs, TVs (larger than 32 inches), dishwashing machines, monitors and projectors set to attract an 18 per cent GST rate compared to 28 per cent earlier.</li> </ul>
Textile & Labour-Intensive Goods	<ul style="list-style-type: none"> <li>• GST rate reduction on man-made fibres from 18 per cent to 5 per cent and man-made yarn from 12 per cent to 5 per cent.</li> <li>• GST on labour-intensive goods such as handicrafts, marble and intermediate leather goods was lowered to 5 per cent from 12 per cent.</li> </ul>
Everyday essentials & food	<ul style="list-style-type: none"> <li>• 5 per cent GST rate on hair oil, toilet soap bars, shampoos, toothbrushes, toothpaste, bicycles, tableware, kitchenware and other household articles; these items were either in the 18 per cent or 12 per cent GST bracket earlier.</li> <li>• Zero GST on Ultra-High Temperature (UHT) milk, all Indian breads, and pre-packaged and labelled paneer.</li> <li>• GST lowered to 5 per cent on almost all food items such as packaged namkeens, instant noodles, chocolates, coffee, preserved meat, butter, ghee, etc. Earlier, these items were subject to a GST rate of 12 per cent or 18 per cent.</li> </ul>

Medicines & Medical Equipment	<ul style="list-style-type: none"> <li>• Zero GST on select lifesaving drugs &amp; medicines.</li> <li>• GST on all other drugs &amp; medicines slashed to 5 per cent from 12 per cent.</li> <li>• 5 per cent GST on (a) Medical apparatus &amp; devices and (b) Medical equipment and supplies.</li> </ul>
Hotel & Personal Services	<ul style="list-style-type: none"> <li>• Hotel accommodation services (value less than or equal to ₹7,500 per unit per day) to be subject to lower GST of 5 per cent from 12 per cent earlier.</li> <li>• Beauty and physical well-being services (gyms, salons, barbers, yoga centres, etc.) to see a lower GST rate of 5 per cent from 18 per cent.</li> </ul>
Insurance Policies	<ul style="list-style-type: none"> <li>• GST exemption to all individual life and health insurance policies as well as to reinsurance of these individual policies.</li> </ul>

The reduction in the tax burden on essential goods, services, and emerging sectors is expected to lower the cost of living, improve affordability, and stimulate household consumption demand. At the same time, the move towards a simplified two-rate structure is expected to reduce transaction costs, ease compliance, and encourage small businesses to enter the formal sector, thereby supporting greater formalisation and widening of the tax base.

Through targeted rate reductions across key sectors, the reform is expected to enhance trade competitiveness and support domestic manufacturing. Lowering the GST on cement and construction materials is expected to reduce project costs and support real estate and infrastructure activities. The reduction in GST on small cars, two-wheelers, and auto parts is expected to boost demand and strengthen India's automotive manufacturing base. Reducing GST to zero per cent on select life-saving drugs and 5 per cent on medical devices is likely to improve healthcare access while encouraging domestic production. Similarly, the shift to a 5 per cent GST rate on toys, handicrafts, and man-made fibres is expected to support labour-intensive MSMEs and expand export potential, collectively reinforcing growth and investment momentum under the reformed GST regime. Beyond growth and formalisation, reduction of GST on solar, wind and related renewable devices from 12 per cent to 5 per cent, in addition to lowering GST on biodegradable bags from 18 per cent to 5 per cent is a major push towards advancing India's climate goals by making renewable energy, waste management, biodegradable products, and green mobility more affordable and within reach.

Aligned with the Viksit Bharat 2047 vision, GST 2.0 also strengthens India's position as a global manufacturing and investment destination. The inverted duty structure (IDS) under

GST, where tax rates on inputs exceed those on outputs, can be structurally eliminated by taxing inputs and intermediate goods at lower rates and placing items of final consumption at relatively higher rates. Keeping in view the need for a calibrated reform approach, next-generation GST reforms have already corrected inverted duty in key labour-intensive and agri-input sectors such as textiles and fertilisers, thereby reducing cost and working capital pressures in these sectors. Further, items rationalised from 12 per cent to 5 per cent or to the nil rate largely pertain to goods of mass and daily consumption. Any residual IDS issues arising from such rationalisation are being addressed through faster, fully automated refunds of unutilised Input Tax Credit (ITC), thereby alleviating working capital stress. Going forward, policy options such as permitting IDS refunds on capital goods and input services may be examined to preserve tax neutrality without significant revenue erosion.

Recent trends in high-frequency indicators, including higher e-way bill generation, improved Purchasing Managers' Index (PMI) readings for manufacturing and services, record festive-season automobile sales, robust UPI transactions, and increased tractor sales, indicate a strengthening economic momentum during September-December 2025, following the implementation of GST reforms.

2.17 With the introduction of GST in 2017, the abolition of physical check-posts across States marked a major structural reform, significantly improving the free movement of goods and reducing transit delays. The e-Way Bill system emerged as an effective digital substitute, enabling online tracking of goods movement while supporting tax administration objectives without reintroducing physical barriers at the State borders. Technology has evolved over time, as have the needs of modern business and logistics. Mobile-based checks of e-Way Bills at interior points may, at times, lead to avoidable disruptions in logistics and compliance friction for bona fide trade.

2.18 The next wave of GST reforms could, therefore, focus on reimagining the e-Way Bill system as a facilitator of smooth logistics rather than only as a tool for enforcement and control, in line with the changing needs of businesses and supply chains. As in the case of NUDGE (Box II.1), policy design could increasingly rely on trust-based and technology-driven compliance models, such as a “trusted dealer” framework, under which taxpayers with a strong compliance record face minimal physical checks and enjoy greater certainty in the movement of goods. At the same time, wider use of e-seals and electronic locking systems, integrated with e-Way Bills and vehicle-tracking technologies, can ensure secure, end-to-end tracking of consignments without routine stoppages on the road. State Governments, which play a key role in field-level enforcement, would be central to this transition by shifting towards risk-based, system-generated alerts and limiting discretionary checks. Together, these reforms would amount to a significant deregulation of the logistics ecosystem, reducing costs and delays for trade while maintaining effective, non-intrusive oversight for tax administration.

## Non-tax revenues buoyed by rising dividends and profits

2.19 The non-tax revenues of the Centre, as a percentage of GDP, have broadly remained stable at around 1.4 per cent of GDP in the post-pandemic period, in line with the pre-pandemic average, thereby providing steady support to the Centre's revenue receipts. This stability has been underpinned largely by a surge in dividends and profits, which grew by over 70 per cent annually during the last two years (Table II.2). The increase reflects higher surplus transfers from the RBI, along with improved financial performance of public sector banks and financial institutions. During FY26, RBI approved a surplus transfer of ₹2.68 lakh crore to the Central Government for the accounting year FY25, which is about 27 per cent higher than the dividend of ₹2.19 lakh crore paid in the previous year. As a result, during April to November 2025, non-tax revenues registered a growth of 20.9 per cent, reaching 88.6 per cent of the Budget Estimates for the year. Among "other" components of non-tax revenue, economic services accounted for a significant share, with major contributions from communication, roads and bridges.

**Table II.2: Trends in non-tax revenue of the Centre (in ₹ lakh crore)**

	FY22	FY23	FY24	FY25 PA	FY26 BE
Interest receipt	0.22	0.28	0.38	0.41	0.48
Dividends and Profits	1.61	1.00	1.71	3.08	3.25
External grants	0.01	0.02	0.01	0.01	0.01
Others	1.81	1.55	1.92	1.87	2.09
<b>Total</b>	<b>3.65</b>	<b>2.85</b>	<b>4.02</b>	<b>5.38</b>	<b>5.83</b>

Source: Union budget documents and CGA.

Note: Other non-tax revenues include user charges, licence fees, royalties, fines and penalties, receipts from economic and general services etc.

2.20 The improved performance of Central Public Sector Enterprises (CPSEs) has also contributed to the growth in the Centre's non-tax revenues. Between FY20 and FY25, the gross turnover per CPSE increased by approximately 32 per cent, while net profits and dividends per CPSE went up by 174 per cent and 69 per cent respectively (**Table II.3**), reflecting operational efficiency and effective capital management of PSUs. This has also helped to protect the interests of minority stakeholders in CPSEs.

**Table II.3: Key metrics of CPSEs' performance over 5 years**

	FY20	FY25
No. of Operating CPSEs	256	291
Total Gross Turnover (₹ lakh crore)	24.62	37.01
Net profit (₹ lakh crore)	0.93	2.91
Dividend (₹ lakh crore)	0.72	1.39

Source: Department of Public Enterprises.

## Non-debt capital receipts

2.21 Receipts from asset and equity monetisation are an important component of the Government's non-debt capital receipts. During FY26 (up to 31 December 2025), the disinvestment activity remained focused on market-based transactions aligned with valuation discipline and minimum public shareholding norms. Three OFS transactions were undertaken – in Mazagon Dock Shipbuilders Limited, Bank of Maharashtra and Indian Overseas Bank. These OFS transactions together mobilised around ₹7,717.02 crore. In addition, remittances from SUUTI<sup>12</sup> totalled approximately ₹1,051 crore during the year. InvIT-based monetisation yielded ₹18,837 crore.

2.22 Strategic disinvestment has progressed in a calibrated manner over recent years. Since 2016, in-principle approval has been accorded for strategic disinvestment for 36 CPSEs, of which 13 transactions have been completed, with the remainder at various stages of implementation. During FY26, approvals were also accorded for stake dilution or exit from select joint ventures, including NTPC's divestment from Utility Powertech Limited. These actions were complemented by governance reforms that empowered CPSE Boards to undertake the closure, merger, or disinvestment of subsidiaries.

2.23 Going forward, receipts from equity monetisation can be strengthened by selectively reducing Government equity in certain CPSEs beyond the minimum public shareholding norms<sup>13</sup>, guided by market conditions and enterprise-specific factors. Currently, in about 30 per cent of listed CPSEs, Government shareholding is already below 60 per cent, limiting further disinvestment through OFS, as it is stipulated in the Companies Act that a 'government company' must have at least 51 per cent of its stake held by the central or state government. Since effective control requires only about a 26 per cent stake, the Government could consider amending the definition of "Government Company" under the Companies Act, limited to listed entities, to allow them to remain as government companies with a minimum of 26 per cent ownership, thereby retaining special resolution rights, while enabling the government to monetise its stake. Alternatively, if the objective is eventual privatisation, the Government could continue phased OFS below 51 per cent and even towards full exit, without changing the legal definition of "government company". This would enable CPSEs to function post-disinvestment as professionally managed entities with dispersed ownership, clear governance standards, and transparent succession frameworks. A portion of disinvestment receipts could also be earmarked for strategic investments in emerging technology and innovation-driven companies through professionally managed platforms such as the National Investment and Infrastructure Fund (NIIF), thereby

<sup>12</sup> Specified Undertaking of Unit Trust of India (SUUTI) was created during the bifurcation of the erstwhile UTI into two parts i.e. SUUTI & UTI-AMC - with effect from 01.02.2003. SUUTI managed the failed schemes and refund to investors. It still holds some stake in companies like NSDL, ITC etc.

<sup>13</sup> Which says that at least 25 per cent of shares in a listed company have to be held by public shareholders.

recycling public capital toward future growth sectors. This will also ensure a steady stream of disinvestment receipts into the future.<sup>14</sup>

## Trends in expenditure

### Continued rationalisation in revenue expenditure

2.24 As fiscal deficits consolidated in the aftermath of successive economic shocks, a significant part of the adjustment has been achieved through the rationalisation of revenue expenditure. The revenue expenditure has moderated from 13.6 per cent of GDP in FY22 to 10.9 per cent in FY25, which is lower than the pre-pandemic average of 11.1 per cent of GDP, thereby creating space for more productive capital expenditure.

2.25 A large share of revenue expenditure, covering salaries, pensions, interest payments, and defence, is committed in nature, highlighting the importance of rationalising discretionary spending, particularly subsidies, to create fiscal space. Expenditure on major subsidies (See Table II.4), which rose during the pandemic, declined from 1.9 per cent of GDP in FY22 to 1.2 per cent in FY25 and is budgeted at 1.1 per cent of GDP in FY26. This consolidation has been achieved alongside a continued commitment to food security, with about 78.9 crore beneficiaries receiving free food grains as of October 2025.<sup>15</sup>

**Table II.4: Revenue Expenditure (₹ lakh crore)**

	FY22	FY23	FY24	FY25 PA	FY26 BE
Pay & Allowances	2.49	2.69	2.92	3.31*	3.52
Pension	1.99	2.42	2.38	2.74	2.77
Major subsidies	4.46	5.31	4.12	3.88	3.83
<i>of which</i>					
Fertilizer	1.54	2.51	1.88	1.74	1.68
Food	2.89	2.73	2.12	2.00	2.03
Petroleum	0.03	0.07	0.12	0.14	0.12
Interest payments	8.05	9.29	10.64	11.16	12.76
Defence services	2.29	2.56	2.90	2.91	4.92
Others	12.73	12.26	11.98	12.04	11.64
<b>Total</b>	<b>32.01</b>	<b>34.53</b>	<b>34.94</b>	<b>36.04</b>	<b>39.44</b>

Source: Union budget documents and CGA.  
Note: \*FY25RE.

<sup>14</sup> by cashing out when valuations are attractive for such companies as they mature.

<sup>15</sup> Under the NFSA, 2013, with the provision extended for five years from January 2024 to 2029, at an estimated cost of ₹11.80 lakh crore, fully funded by the Central Government.

2.26 In addition to streamlining the design of subsidy schemes, efficiency gains from the Direct Benefit Transfer (DBT) framework have played a key role in reducing subsidy outlays by curbing fiscal leakages, estimated at ₹3.48 lakh crore over the past decade.<sup>16</sup> These gains have been made possible by improved targeting, even as beneficiary coverage expanded nearly sixteen-fold from about 11 crore to 176 crore over the past decade. The efficiency gains are evident across major schemes, including PDS, MGNREGA<sup>17</sup>, PM-KISAN and fertiliser subsidies.<sup>18</sup> An issue that remains to be addressed is cross-subsidy in the railway traffic and power sectors (See Box II.3).

### Box II.3: Cross Subsidies in railway traffic and power distribution

For FY23, freight earnings accounted for about 68 per cent of the gross traffic receipts of Railways, largely reliant on coal transportation. The profit from freight traffic was utilised to offset the loss on passenger and other services, leaving an uncovered loss of ₹5257 crore from passenger operations<sup>19</sup>. CAG<sup>20</sup> has recommended critically analysing the cost of passenger operations, taking steps to reduce its losses, and diversifying its freight basket to enhance freight earnings. During the last 5 years, the passenger fare has been rationalised on three occasions i.e., on 1 January 2020, 1 July 2025 and 26 December 2025, and consequently, the share of freight earnings in gross traffic receipts has declined gradually from 68 per cent in FY 23 to 65 per cent in FY25 and is budgeted to be 62 per cent in FY26.

High freight rates, due to cross-subsidisation, distort competition with roads, inflating commodity and consumer prices, as well as logistics costs. Rationalising freight rates could improve revenue buoyancy, incentivise a modal shift of freight from roads to rail, and increase market share. This, in turn, would stimulate economic activity, green the transport sector, and decongest road space.

In India's power sector, cross-subsidisation primarily involves charging higher tariffs to industrial and commercial consumers (subsidising categories) to offset lower tariffs for domestic and agricultural users (subsidised categories). This is structured through category-wise subsidies, where the average billing rate (ABR) for the former category exceeds the average cost of supply (ACoS), while the latter pays below ACoS. The Electricity Act, 2003, requires SERCs to progressively reduce cross subsidies in 10 tariffs so as to ensure that they reflect the cost of supply.<sup>21</sup> However, in some states, for certain categories, ACoS coverage exceeds the ±20 per cent limit specified in the Tariff Policy.<sup>22</sup>

16 Source: <https://tinyurl.com/5n8vjva4>.

17 The Viksit Bharat – Guarantee for Rozgar and Ajeevika Mission (Gramin) (VB-G RAM G) Act, 2025 was enacted in December 2025, replacing the MGNREGA.

18 See footnote 16.

19 According to the Ministry of Railways, based on the operating ratio in 2022-23 (98.1%), net revenue could be treated as (+) ₹2,517 Cr.

20 Comptroller and Auditor General of India. (2025). Report No. 9 of 2025: Union Government (Ministry of Railways). <https://tinyurl.com/3n6s8hye>.

21 CRISIL Infrastructure Advisory. (2019). Final report of the research study on diagnostic study for power distribution. NITI Aayog. <https://tinyurl.com/mrxjyv5c>.

22 Forum of Regulators. (2015). Report on road map for reduction in cross subsidy. <https://tinyurl.com/4eu2znrp>.

Accordingly, the Electricity (Amendment) Bill, 2025, was introduced to address deep-rooted inefficiencies, alleviate financial strain on the power sector, promote competition, and optimise network costs across India's power distribution sector. It aims to transform the existing market structure by rationalising cross-subsidies, promoting cost-reflective tariffs, and enabling direct power procurement by industrial users. It mandates that the tariff *must* reflect the cost of supplying electricity. It also requires that cross-subsidies paid by manufacturing enterprises, railways, and metro railways must be fully eliminated within five years.<sup>23</sup> Going forward, a balanced approach could include rationalising tariffs for subsidised categories by introducing phased rates and quotas, as well as voluntary and category-based exclusions.

2.27 Interest payments, another major component of the Centre's revenue expenditure, increased from an average of about 3.1 per cent of GDP in the pre-pandemic years to around 3.4 per cent of GDP in the post-pandemic period, reflecting higher borrowing undertaken to support economic recovery during the pandemic. Interest payments account for approximately 36.8 per cent of the net revenue receipts to the Centre<sup>24</sup> in FY25(PA). Going forward, interest costs are expected to be contained through active debt management measures being undertaken by the Government, such as switch and buyback operations, and calibrated issuance across the yield curve. In parallel, sustained direct and indirect tax reforms are expected to strengthen revenue flows in the medium term, thereby directly reducing incremental borrowing requirements and, in turn, the interest burden as fiscal consolidation progresses.

2.28 The government could also adopt measures to enhance the efficiency of its collections by making them real-time (such as requiring banks to remit TDS on a real-time basis instead of in batches) and, if necessary, engage a treasury manager to invest its short-term surpluses in liquid instruments, thereby earning more return on its cash balances. The Government has already undertaken significant process reforms to improve the efficiency, timing, and transparency of fund releases, and while incurring expenditures, details of some of which are outlined in Box II.4 below.

#### Box II.4: Tech-driven solutions for improving efficiency in public expenditures

##### **Just-in-Time (JIT) Fund Release Reforms**

The Central Government has undertaken a major public financial management reform by shifting to a Just-in-Time (JIT) fund release system to improve cash management, reduce idle balances, enhance transparency, and strengthen expenditure efficiency. This reform

<sup>23</sup> <https://tinyurl.com/262nrpsh>.

<sup>24</sup> Net revenue receipts to the Centre = Net tax revenue to the Centre + Centre's non-tax revenue.

replaces the earlier credit-push model of bulk fund releases with a debit-pull model, under which funds are released only when expenditure is incurred. JIT has been implemented through two key initiatives:

SNA-SPARSH (Single Nodal Account-Samyochit Pranali Ekikrit Shighra Hastantaran) for Centrally Sponsored Schemes (CSS) and the Treasury Single Account (TSA) and TSA Hybrid models for Central Sector (CS) schemes.

The reform was necessitated by large idle balances parked with implementing agencies, averaging about ₹1.6 lakh crore under CSS, leading to inefficiencies, fund diversion risks, and high opportunity costs (particularly when government borrowing rates are around 7 per cent per annum). Launched in 2023, SNA-SPARSH enables JIT release of the Central share of CSS directly from RBI accounts against actual expenditure based on prior mother sanctions issued, thereby eliminating bulk transfers and preventing fund diversion. Integrated with Public Financial Management System (PFMS), State FMIS, and RBI's e-Kuber, it now covers all 28 States, 3 UTs, and 73 CSS including umbrella schemes (as of 15.01.2026). SNA balances declined sharply from ₹1.67 lakh crore in April 2024 to ₹1.22 lakh crore in April 2025 and to about ₹0.4 lakh crore as on 15.01.2026, generating significant interest savings and reducing reliance on short-term borrowings.

For Central Sector schemes, TSA extends JIT principles by eliminating advance transfers to implementing agencies, with funds drawn directly from RBI accounts through assignment limits. From FY25, all CS schemes with outlays of ₹100 crore or more are covered. The TSA Hybrid model addresses schemes involving private or lower-tier agencies by ensuring immediate, JIT transfers for payments. As on 15.01.2026 for FY26, 157 schemes are covered under TSA CS, with assignments of ₹3.09 lakh crores issued and ₹2.45 lakh crores of expenditure incurred. For TSA OCE (other central expenditure), the number of schemes covered stands at 93, with assignments of ₹0.9 lakh crore issued and ₹0.79 lakh crores of expenditure incurred, alongside substantial savings in interest costs.

### **Tech-driven solutions in the Public Distribution System (PDS) supply chain**

Route Optimisation in the Public Distribution System (RO-PDS) in India is a strategic initiative to improve efficiency and reduce costs by using optimisation algorithms developed by IIT-Delhi and the UN World Food Programme. These algorithms define optimal warehouse-to-warehouse and warehouse-to-Fair Price Shop (FPS) routes, lowering transportation costs, saving time, and ensuring timely delivery of food grains through operations research.

Within a year, route optimisation assessments were completed across 31 States/Union Territories (UTs), with estimated annual transportation savings of about ₹250 crore. Interstate optimisation for moving food grains from surplus to deficit states was also achieved by integrating the Freight Operating Information System (FOIS) of Centre for Railway Information Systems (CRIS) with the indigenous PM Gati Shakti Master Plan Platform for distance optimisation.

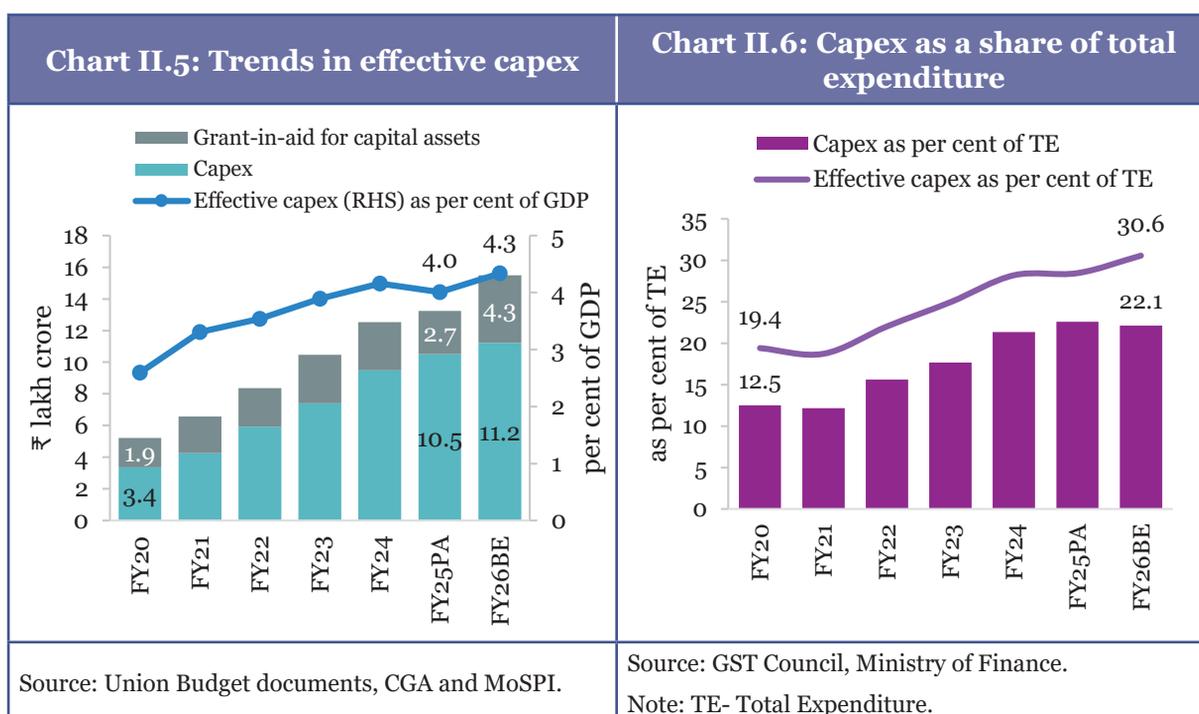
The initiative delivers both economic and environmental benefits. Since food miles contribute nearly one-fifth of global food system emissions, optimising PDS routes helps reduce fuel

use and CO<sub>2</sub> emissions, supporting India’s Paris Agreement and COP commitments, conserving foreign exchange, and promoting a climate-smart food supply chain. States reduced average transport distances by up to 50 per cent and CO<sub>2</sub> emissions by up to 35 per cent.

Building on these results, optimisation plans for the Kharif Marketing Season 2025–26 have been developed for 10 paddy-procuring states. RO-PDS also seeks to minimise human intervention that increases costs and pilferage. State governments have been provided the Anna Chakra Optimisation Tools, while FCI has received the Rake Optimisation Tool to automate and optimise grain supply chain decisions nationwide, aligned with the PM Gati Shakti initiative.

### Capital expenditure

2.29 The Centre has progressively scaled up capital expenditure from an average of 1.7 per cent of GDP in the pre-pandemic period to an average of 2.9 per cent of GDP in the years after the pandemic (Chart II.5). At the same time, effective capex, a broader measure which includes capital expenditure along with grants-in-aid for the creation of capital assets, increased from an average of 2.7 per cent of GDP to 3.9 per cent of GDP over the same period, and further to 4 per cent in FY25 (PA). These grants-in-aid have supported asset creation in key areas, including urban and housing affairs, the Jal Jeevan Mission, and rural development. The sustained expansion of the capital component, achieved alongside declining revenue and fiscal deficits, reflects a deliberate rebalancing of expenditure towards asset-creating outlays (Chart II.6).



2.30 Emphasis on asset creation is also reflected in the composition of capital expenditure across key infrastructure sectors. Road transport and highways, along with railways, continued to account for over half of total capital expenditure through FY25(PA). At the same time, allocations towards transfers to States, telecommunications, and housing and urban affairs recorded robust double-digit growth, leading to a higher share for these sectors in overall capex.

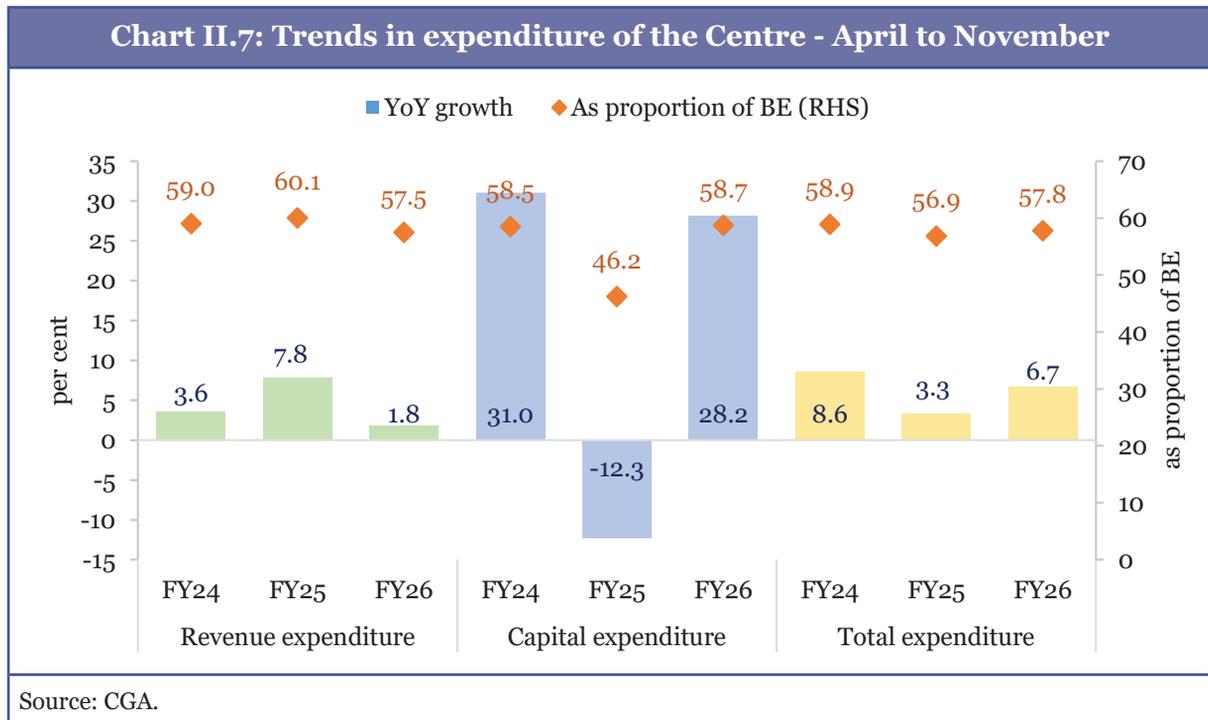
**Table II.5: Capital expenditure by the Centre**

	FY24	FY25 PA	
	₹ lakh crore		YoY growth (per cent)
Road Transport and Highways	2.64	2.85	8.1
Railways	2.43	2.52	3.9
Defence	1.65	1.71	3.7
Transfer to States	1.23	1.66	34.9
Telecommunications	0.59	0.74	24.4
Housing and urban affairs	0.26	0.32	19.6
Others	0.69	0.73	5.0
<b>Total</b>	<b>9.49</b>	<b>10.52</b>	<b>10.8</b>

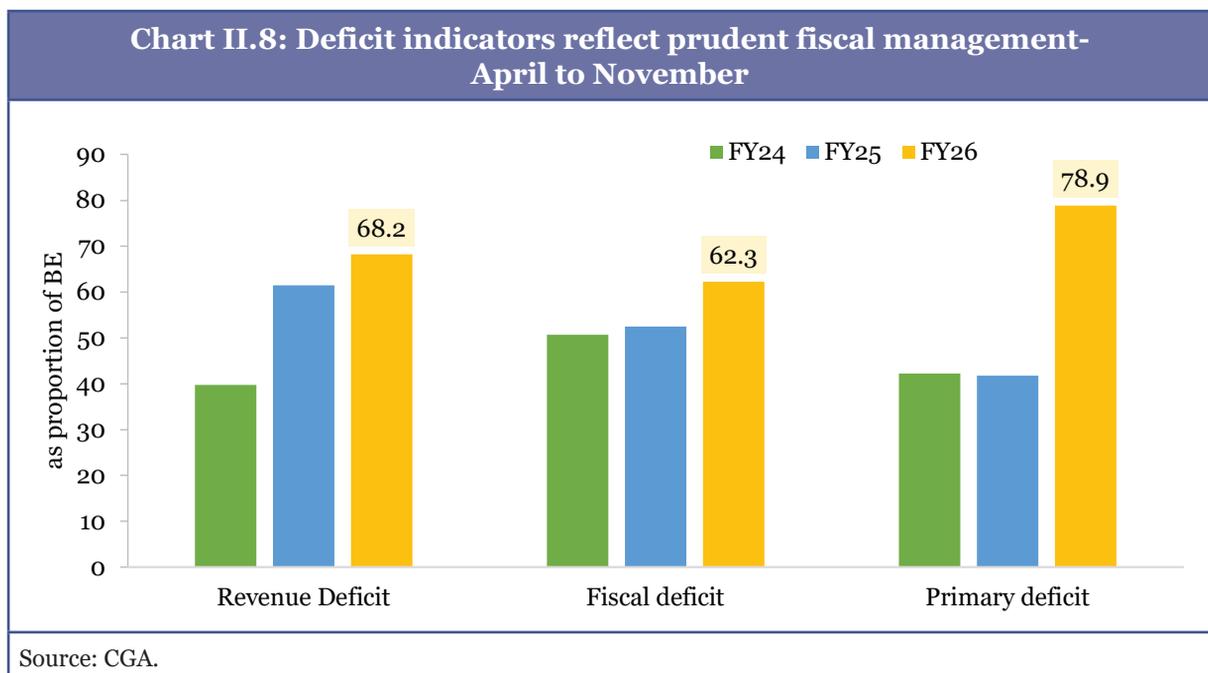
Source: Union budget documents and CGA.

### Trends in expenditure in FY26

2.31 During the current fiscal year, capex recorded a strong rebound, rising by 28 per cent YoY as of the end of November 2025 (Chart II.7). This amounted to nearly 59 per cent of the budgeted allocation for capex, which was in line with the trends in FY24 (FY25 had a lower expenditure rate in the first half as it was an election year). On the other hand, revenue expenditure grew by only 1.8 per cent during the first eight months of the year, reflecting a continued commitment to fiscal consolidation. Total expenditure as a share of Budget Estimates was broadly in line with the performance observed during the same period in the past two years.



2.32 As of November 2025, the revenue deficit has reached 68.2 per cent of the budget estimate for FY26, while the fiscal deficit stands at 62.3 per cent of the estimated figures, indicating that the Central Government is on track to achieve its budgeted deficit target for the year. (Chart II.8)



## OVERVIEW OF STATE GOVERNMENT FINANCES

### Expanding Centre-State transfers through tax devolution and Finance Commission grants

2.33 Fiscal transfers from the Centre to the States constitute an important component of the overall fiscal landscape. Transfer of funds from the Centre to the States comprises the share of States in Central taxes devolved to the States, Finance Commission Grants, CSS, and other transfers. The total transfer of resources from the Centre to the States has increased significantly in recent years, more than doubling between FY20, the last year of the Fourteenth Finance Commission (XIV-FC) award period, and FY26 (BE). In GDP terms, total transfers rose from 5.7 per cent to 6.9 per cent over the period, and in absolute terms from ₹11.5 lakh crore to ₹25.6 lakh crore (Table II.6).

**Table II.6: Details of transfers from Centre to States (₹ lakh crore)**

	FY22	FY23	FY24	FY25RE	FY26 BE
States' share in Central taxes	9.0	9.5	11.3	12.9	14.2
Centrally Sponsored Schemes	3.4	4.1	4.3	4.0	5.3
Finance Commission Grants	2.1	1.7	1.5	1.3	1.3
Other Grants/Loans/Transfers	2.6	3.3	3.5	4.6	4.8

Source: Union budget documents.

### Finance Commission grants

2.34 For FY26, the Fifteenth Finance Commission (XV-FC) has recommended ₹1,47,827 crore as grants-in-aid to States under Article 275 of the Constitution. These grants comprise post-devolution revenue deficit grants, grants to local bodies (including health sector grants), and disaster management grants (Table II.7). The utilisation of these grants has implications on the growth trajectory of the States, as discussed in Box II.5.

**Table II.7: Disbursement of FC grants in FY26**

Category	Recommended for FY26	Released as on 31 Dec 2025
Post-Devolution Revenue Deficit Grants	₹13,705 crore	₹10,279 crore
Local Body Grants (Rural and Urban) <sup>25</sup>	₹76,821 crore	₹25,884 crore
Health Sector Grants	₹15,272 crore	₹12,968 crore
Disaster Management Grants (Centre's share)	₹42,029 crore	₹28,666 crore

Source: Department of Expenditure.

<sup>25</sup> Including grants for shared municipal services and incubation of new cities.

### Box II.5 Fiscal devolution and economic convergence across States

Fiscal devolution is a core feature of India's intergovernmental fiscal architecture. Transfers from the Centre expand the fiscal space available to States, but their contribution to growth depends on prevailing fiscal conditions and, more importantly, on how these resources are deployed. Evidence from long-term State-level analysis by the Maharashtra Institution for Transformation (MITRA) over 1980-81 to 2022-23 indicates that higher transfers, by themselves, do not automatically generate faster growth in lower-income States; the growth payoff is mediated by expenditure composition and fiscal discipline.

After accounting for structural and fiscal differences including initial income levels, capital outlay, aggregate grants, fiscal deficits and human capital indicators, the analysis finds capital expenditure to be the most consistent and statistically significant driver of per capita income growth. States that devote a larger share of resources to capital formation tend to record stronger growth outcomes even after controlling for other factors, underscoring the persistent productivity effects of public investment.

By contrast, the aggregate volume of grants does not show a stable or robust association with growth when examined in isolation, suggesting that the impact of fiscal devolution hinges less on the magnitude of transfers and more on their deployment. Higher fiscal deficits are associated with weaker subsequent growth, highlighting the macro-stability costs of undisciplined borrowing, while improvements in human capital translate more effectively into growth when accompanied by complementary investment and employment generation.

Taken together, the evidence indicates that what ultimately matters for household welfare is not merely the flow of transfers but the conversion of public resources into productive assets and opportunities. Capital expenditure, by improving infrastructure, reducing transaction costs, crowding-in private investment and supporting employment, delivers more durable gains in household incomes and living standards than short-term, transfer-led approaches. While cash or grant-heavy spending can ease near-term constraints, it does not, on its own, create the productivity improvements needed for broad-based income growth. The findings therefore underline the importance of protecting capital spending, strengthening investment execution capacity, and aligning fiscal devolution with growth-enhancing public investment so that convergence rests on lasting improvements in incomes and human welfare rather than transient redistribution.

### Enhanced borrowing limits for the States

2.35 The XV-FC has recommended a Net Borrowing Ceiling (NBC) of 3 per cent of GSDP for the States in FY26. In addition, States may avail performance-linked additional borrowing of up to 0.5 per cent of GSDP for the power sector, over and above the normal borrowing ceiling. This dispensation, originally applicable from FY21 to FY25 and later extended to FY26, is linked to improving the operational and economic efficiency of the sector and promoting a sustained increase in paid electricity consumption.

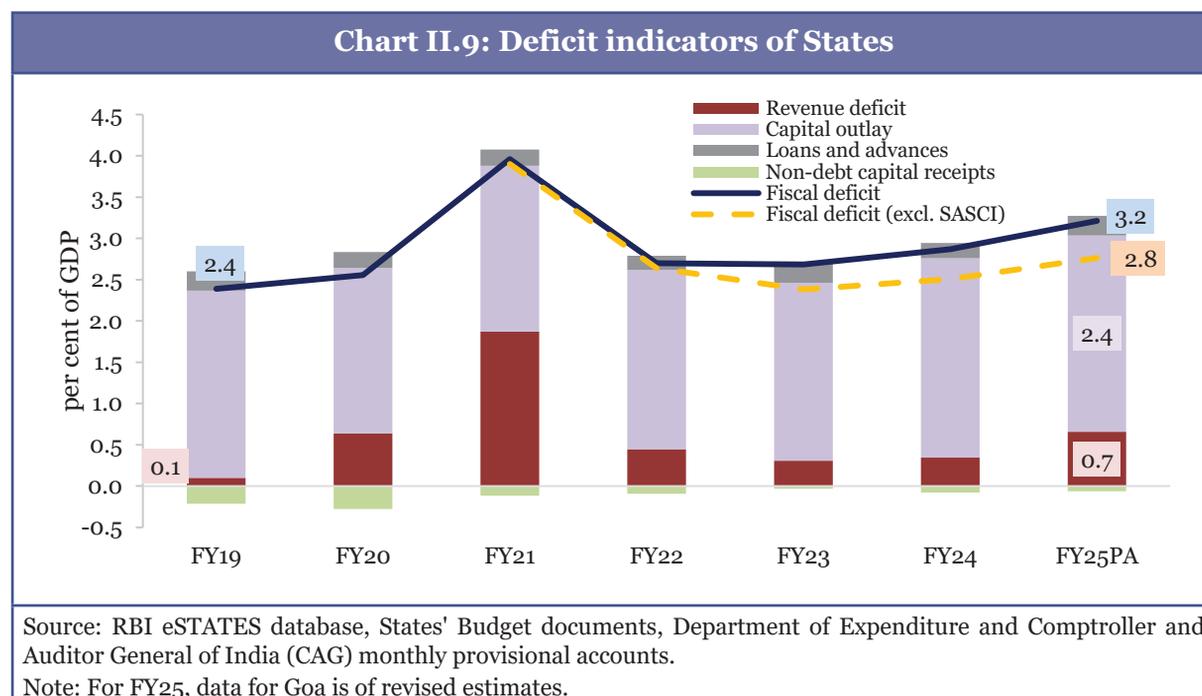
2.36 Furthermore, States are permitted to borrow over and above their normal borrowing limits by an amount equal to the pension contributions (both employer's

and employees’) that they deposit under the National Pension System (NPS) with the designated authority (NSDL or the trustee bank). For FY26, this translates into an additional borrowing space of ₹69,769 crore (as of November 17, 2025). This additional borrowing is intended to address the divergence in pension accounting across States, whereby those following a ‘pay-as-you-go’ system report lower fiscal deficits, as their future pension liabilities are not explicitly reflected, whereas states following the NPS incur a current expenditure that enlarges their fiscal deficit.

## Performance of State Finances

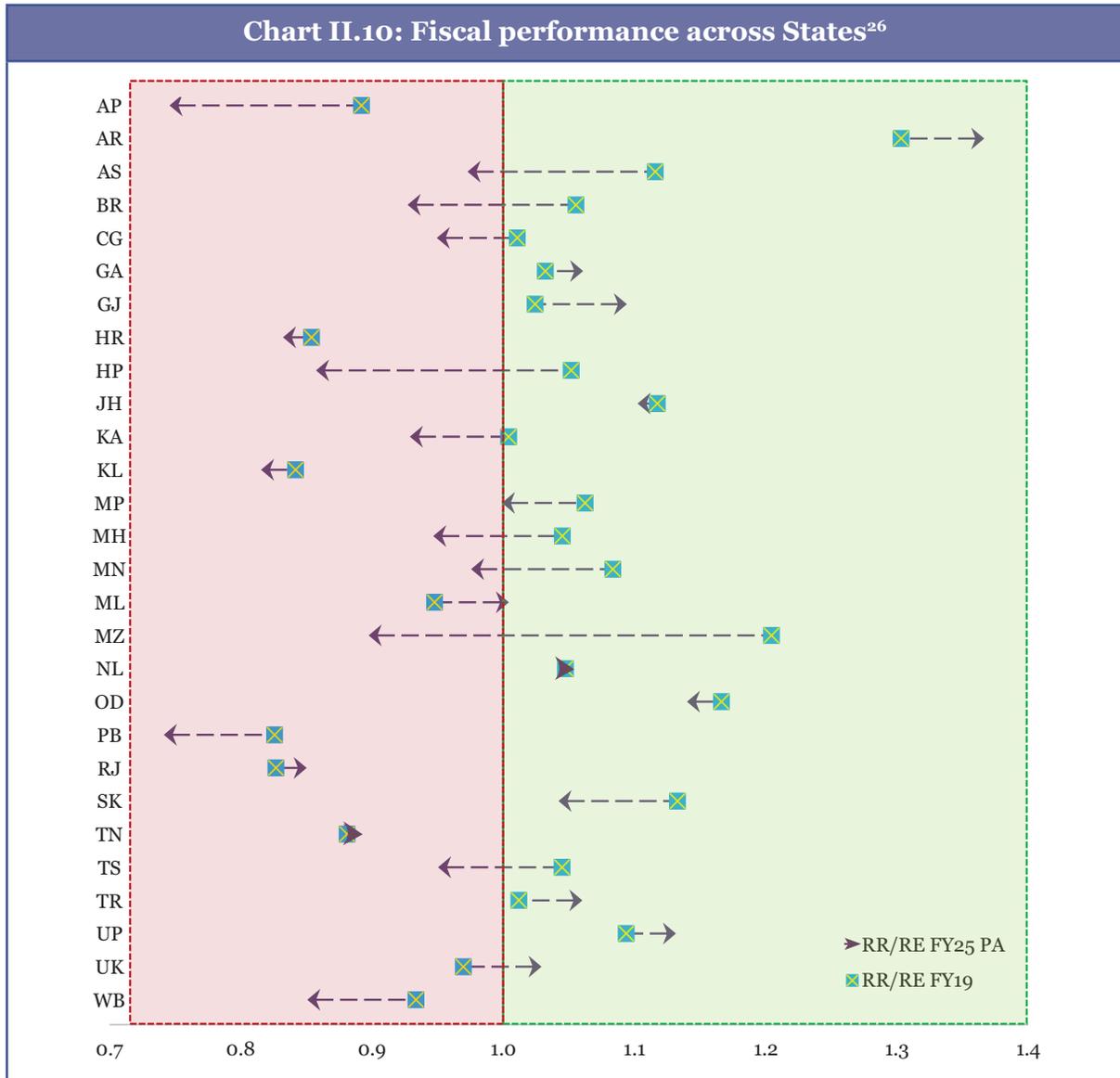
### Increasing revenue and fiscal deficit while capex remains intact

2.37 The combined fiscal deficit of State Governments, as a proportion of GDP, has, on average, remained broadly stable at around 2.8 per cent in the post-pandemic period, similar to pre-pandemic levels. However, after the sharp correction from the pandemic-induced spike of around 3.9 per cent, State deficits have gradually edged up again over the past three years to 3.2 per cent, reflecting emerging pressures on State finances. Excluding SASCI - the Scheme for Special Assistance to States for Capital Investment, under which the Centre provides 50-year interest-free loans to states exclusively for capital expenditure – the fiscal deficit is back in the range of 2.8 per cent.



2.38 Between FY19 and FY25PA, 18 States saw a deterioration in their revenue balances, of which 10 slipped into revenue deficit from revenue surplus, 5 worsened their revenue deficit and 3 managed to stay in revenue surplus despite a deterioration. Overall, states in revenue surplus reduced from 19 in FY19 to 11 in FY25(PA) leading to an overall

increase in revenue deficit of states as a collective, to 0.7 per cent from 0.1 per cent of GDP in FY19. Further, between FY24 and FY25PA, the revenue deficit increased by 40 basis points across all states. A key driver of this renewed fiscal stress has been lagging revenue growth relative to nominal GDP growth, compounded by the incurring of expenditures such as discretionary unconditional cash transfers.

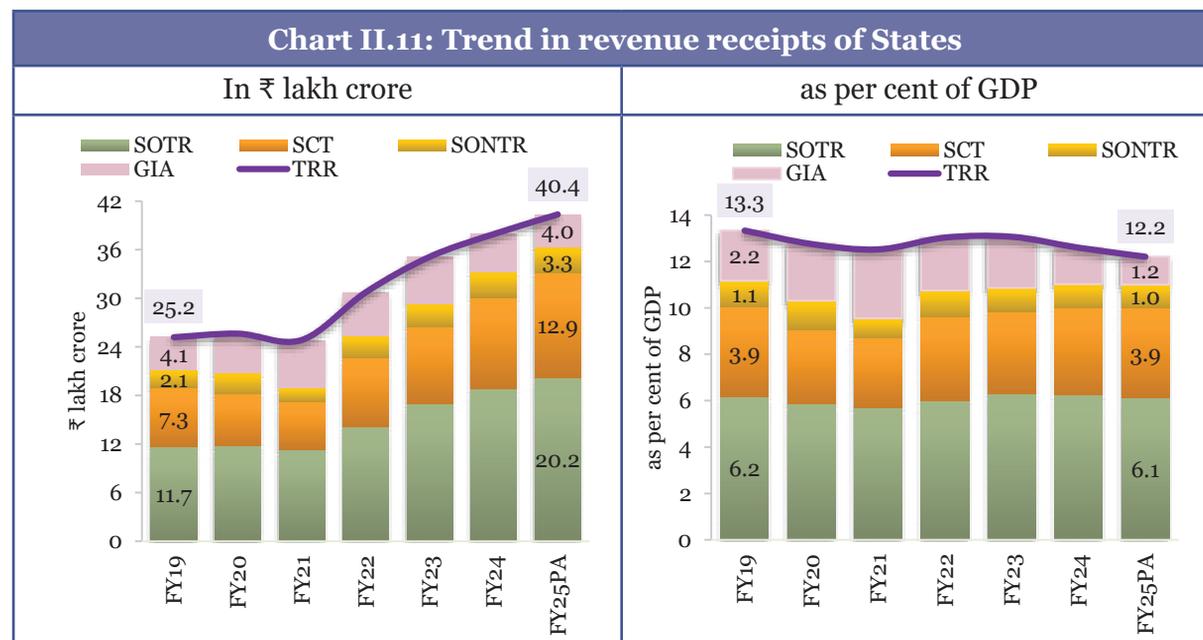


Source: RBI eSTATES database and CAG monthly provisional accounts.  
 Note: Data for GA are revised estimates for FY25. RR- revenue receipts, RE- revenue expenditure.  
 A ratio of greater than 1 indicates a revenue surplus and less than 1 indicates a revenue deficit.

**2.39 States derive most of their revenues from their own tax sources, which registered a CAGR of 12.6 per cent in the post-pandemic period. Resultantly, the share of States’**

<sup>26</sup> Andhra Pradesh (AP), Arunachal Pradesh (AR), Assam (AS), Bihar (BR), Chhattisgarh (CG), Goa (GA), Gujarat (GJ), Haryana (HR), Himachal Pradesh (HP), Jharkhand (JH), Karnataka (KA), Kerala (KL), Madhya Pradesh (MP), Maharashtra (MH), Manipur (MN), Meghalaya (ML), Mizoram (MZ), Nagaland (NL), Odisha (OD), Punjab (PB), Rajasthan (RJ), Sikkim (SK), Tamil Nadu (TN), Telangana (TS), Tripura (TR), Uttar Pradesh (UP), Uttarakhand (UK) and West Bengal (WB).

own tax revenue in total revenue receipts increased from 46 per cent in FY22 to about 50 per cent in FY25 (PA) (Chart II.11). The states' share in central taxes constituted the second-largest source, at around 32 per cent, followed by grants-in-aid and non-tax revenues.



Source: RBI eSTATES database, States' Budget documents, CAG monthly provisional accounts and CGA.

Notes:

1. For FY25PA, data for Mizoram, Sikkim, and Goa are FY25 Revised Estimates.
2. SOTR stands for States' Own Tax Revenue, SCT- Share in Central Taxes, SONTR- States' Own Non-Tax Revenue, GIA- Grants-in-Aid, TRR- Total Revenue Receipts.
3. For FY25PA, SOTR is calculated as total tax revenue minus share in central taxes.
4. Grants-in-aid also include GST compensation to States.

2.40 Total revenue receipts of States, as a percentage of GDP, declined from about 13.3 per cent in FY22 to 12.2 per cent in FY25(PA), thereby constraining fiscal space at the combined State level. In this environment where revenues are not matching the pace of nominal GDP growth, the Central Government has extended interest-free loans to States to safeguard capital expenditure. Allocations under SASCI increased sharply from about ₹12,000 crore in FY21 to around ₹1.5 lakh crore in FY26. As a result, notwithstanding the rise in revenue deficits, capital expenditure by States as a share of GDP remained broadly stable at about 2.4 per cent, underscoring the role of SASCI in protecting growth-oriented spending amid fiscal pressures.<sup>27</sup> (See Box II.6).

<sup>27</sup> Conversely, since SASCI is linked to capital expenditure, States may be increasingly reallocating their own resources toward revenue expenditure.

**Box II.6: Special Assistance to States for Capital Expenditure/Investment**

A major boost to States' fiscal capacity in recent years has come from the Central Government's Scheme for Special Assistance to States for Capital Expenditure (SASCI). Launched in October 2020 in the wake of the pandemic, the scheme provides 50-year interest-free loans to support State-level capital expenditure, recognising its high multiplier effects and role in crowding in private investment. Reflecting strong uptake and positive feedback from States, the scheme has been continued with progressively higher allocations from FY22 to FY26, resulting in total uptake of ₹4,49,845 crore from FY21 to FY26 (till 04.01.2026). The scheme consists of two parts, with a tied and an untied component.

**Table II.8: Total amount released to State Governments/UTs under SASCI (in ₹ crore)**

FY	Budget Estimates	Revised estimates	Actuals
2025-26	1,50,000		83,595*
2024-25	1,50,000	1,25,000	1,49,484
2023-24	1,30,000	1,05,551	1,09,554
2022-23	1,00,000	76,000	81,196
2021-22	10,000	15,000	14,186
2020-21		12,000	11,830
<b>Total</b>			<b>4,49,845</b>

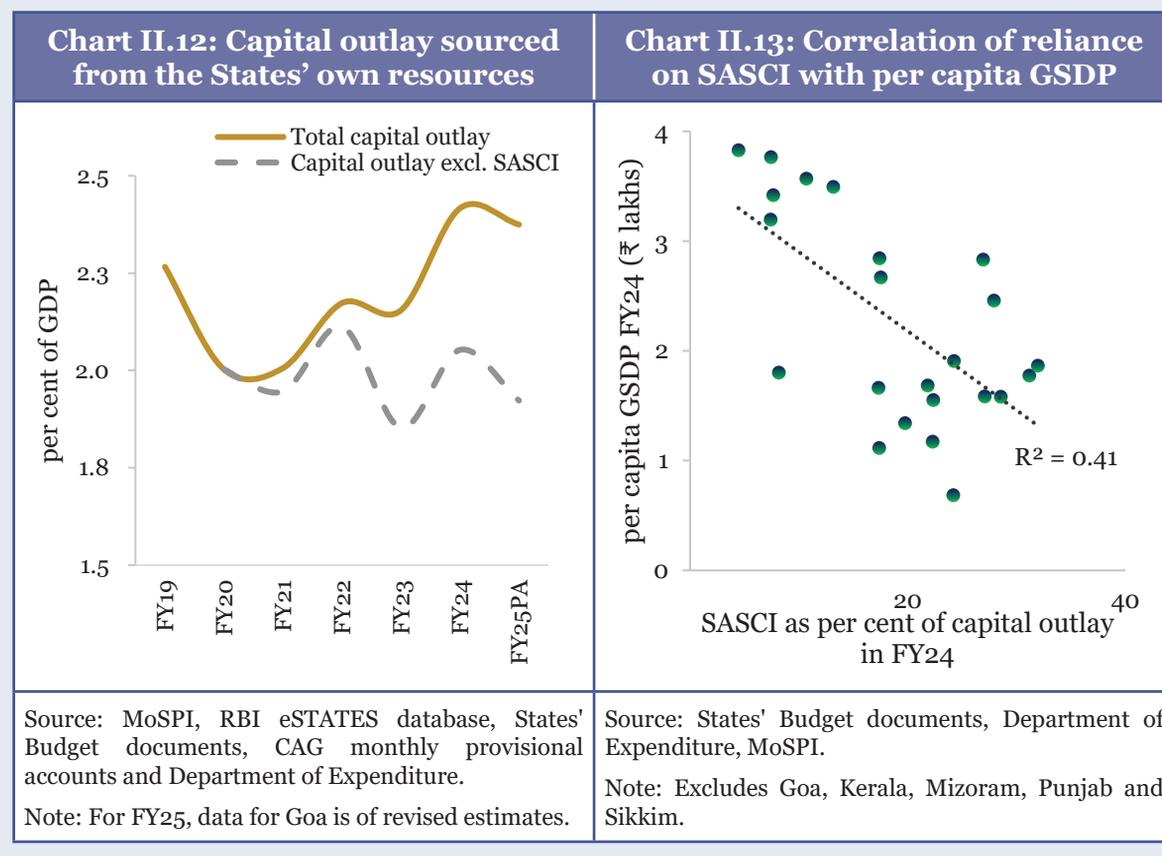
Source: Union Budget documents and Department of Expenditure.

Note: \*uptil 04.01.2026.

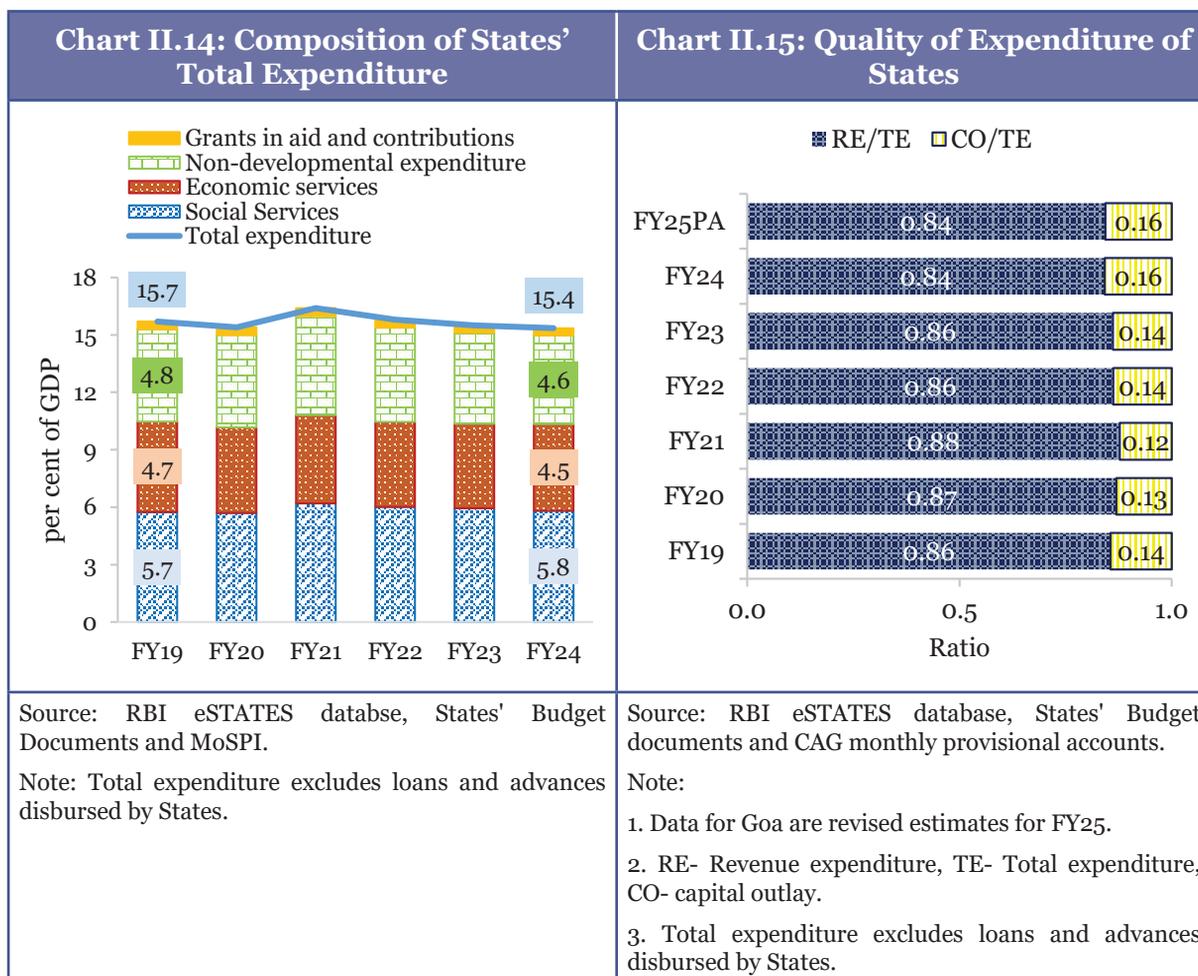
SASCI strikes a balance between a flexible and a reform-oriented approach. In FY26, out of the allotted ₹150,000 crore, around ₹68,000 crore has been allocated as untied assistance, enabling States and UTs to undertake priority capital projects of their choice, while ₹80,000 crore is earmarked for reform-linked and sector-specific investments. An additional ₹2,000 crore has been allocated to support States that have faced exceptional revenue shortfalls in recent years. This structure enables states to sustain investment momentum while advancing reforms that enhance efficiency and medium-term growth potential.

SASCI has played a stabilising role in sustaining State capital expenditure amid pressures on the revenue account. The overall capital outlay of States increased from 2.17 per cent of GDP in FY22 to 2.37 per cent in FY25(PA); however, excluding SASCI-linked capital spending, States' capex declined from 2.11 per cent to 1.92 per cent of GDP over the same period. The scheme has therefore helped States avoid a pro-cyclical compression of public investment. States with lower per capita incomes have relied more heavily on SASCI to finance capital outlay, reaffirming its role in supporting fiscally constrained States to achieve convergence with the high-income

states. By sustaining investment and incentivising reforms, SASCI strengthens productive capacity, enhances future revenue potential, and supports medium-term fiscal health.



2.41 On the expenditure side, total expenditure of States, as a share of GDP, moderated marginally from 15.7 per cent in FY19 to 15.4 per cent in FY24 (Chart II.14). Revenue expenditure continues to account for the bulk of State spending, although its share declined modestly from 86 per cent in FY19 to 84 per cent in FY24 (Chart II.15). Within revenue expenditure, however, the composition has undergone a notable shift, with an increasing tilt towards unconditional cash transfers and other committed outlays. As these transfers absorb a rising share of available fiscal space, the scope for expanding productive capital expenditure becomes increasingly constrained, especially in an environment of limited revenues and elevated deficits. The fiscal trade-offs and medium-term implications of this trend are examined in Box II.7.



**Box II.7: Unconditional Cash Transfers - Fiscal Trade-offs and Medium-term Implications**

Unconditional cash transfers (UCTs) have expanded rapidly across several States and now form a growing share of State-level welfare spending. Aggregate spending on UCT programmes, particularly for women, is estimated at approximately ₹1.7 lakh crore for FY26. The number of States implementing them increased more than fivefold between FY23 and FY26, with around half of these States estimated to be in revenue deficit.<sup>28</sup> Singh (2025)<sup>29</sup> assessed such transfers to be in the range of 0.19 per cent to 1.25 per cent of GSDP and 0.68 per cent to 8.26 per cent of the total budgetary expenditures. She estimates that cash transfers account for a significant share of the monthly income of female casual labourers (11 to 24 per cent) and self-employed workers (11 to 87 per cent), across 7 States where the detailed study was undertaken.<sup>30</sup> They reportedly account for 40 to 50 per cent of the

28 PRS Legislative Research. (2025). State of state finances and outlook 2025. New Delhi: PRS Legislative Research. <https://tinyurl.com/3mehnnuns>.

29 Singh, Chandrika (2025). Cash-in empowerment: Evaluating Cash Transfer Schemes for Women across Indian States. Economic and Political Weekly, 60(52). <https://tinyurl.com/mpdyxra5>.

30 Assam, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Tamil Nadu and West Bengal.

Monthly Per Capita Consumption Expenditure (MPCE) of at least half of the rural population.<sup>31</sup>

It is argued that cash transfers provide immediate income support, helping women meet unmet health and personal needs. Some view it as a return for their unpaid contribution to the GDP.<sup>32</sup> However, their rapid scale-up and persistence raise concerns about fiscal sustainability and medium-term growth, particularly when not complemented by investments in employment, skills, and human capital. Reports indicate they adversely affect female labour force participation.<sup>33</sup> Moreover, this expansion has occurred amid constrained fiscal space. The combined gross fiscal deficit of States rose from 2.6 per cent of GDP in FY22 to 3.2 per cent in FY25PA, while the combined revenue deficit increased from 0.4 per cent to 0.7 per cent of GDP, indicating continued borrowing to finance revenue expenditure. Outstanding liabilities stood at about 28.1 per cent of GDP in FY25. Committed expenditures i.e., salaries, pensions, interest payments, and subsidies, absorbed about 62 per cent of States' revenue receipts in FY24, leaving limited fiscal room.

In this context, higher allocations to UCTs involve clear trade-offs. Unless deficits widen further, additional spending will crowd out resources for critical social and physical infrastructure. But deficits cannot widen any further without causing further deterioration in the overall financial health of the state. These trade-offs are reinforced by programme design: many schemes lack sunset clauses or periodic reviews, increasing rigidity in revenue expenditure. As a result, capital expenditure, whose growth impact is stronger and more durable, often becomes the casualty when fiscal pressures intensify, with adverse implications for medium-term growth.

Evidence supports these concerns. A recent NBER meta-analysis<sup>34</sup> covering 115 randomised evaluations across 72 UCT programmes in 34 low- and middle-income countries finds that while UCTs improve consumption, food security, and short-term income stability, they do not consistently improve child nutrition, educational outcomes, or enable sustained exits from poverty. Such outcomes depend critically on complementary public services and employment opportunities, underscoring that UCTs are not substitutes for investments in health, education, nutrition, childcare, or growth-enhancing public expenditure.

Several countries have linked cash transfers to clear, verifiable actions by beneficiaries, rather than providing open-ended income support. In Mexico's Progresa/Oportunidades<sup>35</sup>,

31 except Jharkhand, where it is more than 100 per cent, due to the higher value of the transfer in Jharkhand, as well as the relatively lower average MPCE of the State.

32 SBI has estimated women's contribution to be around 7.5 per cent of GDP; State Bank of India (SBI) (2023): "Contribution of Unpaid Women in GDP," SBI Research–Ecowrap, 60: 5.

33 Biswas, Partha Sarathi (2024): "Maharashtra Ladki Bahin Scheme Throws a Curveball for Farmers," Indian Express, 11 October.

34 Crosta, Tommaso and Karlan, Dean and Ong, Finley and Rüschenpöhler, Julius and Udry, Christopher, Unconditional Cash Transfers: A Bayesian Meta-Analysis of Randomized Evaluations in Low- and Middle-Income Countries (August 2024). NBER Working Paper No. w32779.

35 Parker, Susan W., and Petra E. Todd. 2017. "Conditional Cash Transfers: The Case of Progresa /Oportunidades." *Journal of Economic Literature* 55 (3): 866–915.

families received cash only if children attended school regularly and pregnant women and young children visited health clinics for check-ups and nutrition monitoring. Payments were stopped if these conditions were not met, and households were periodically reassessed. Brazil's Bolsa Família<sup>36</sup> followed a similar approach: continued eligibility required minimum school attendance and compliance with basic health requirements such as immunisation and maternal care. These conditions ensured that public spending directly supported education, health, and nutrition outcomes, not just consumption.

Some programmes also have built-in exit or review mechanisms. In the Philippines' Pantawid Pamilyang Pilipino Program, benefits were time-limited and subject to regular reassessment, with families expected to "graduate" once conditions improved. In contrast, a few pilots went further: the Opportunity NYC programme<sup>37</sup> in the United States was explicitly designed as a time-bound experiment, where families earned cash rewards for meeting education, health, and work-related targets, and the programme ended after evaluation. These experiences show that cash support can be designed as conditional, review-based, and time-bound, reducing long-term fiscal rigidity while strengthening human capital outcomes—features largely absent in fully unconditional transfer schemes.

Taken together, these considerations argue for careful reprioritisation within State budgets. Preserving fiscal space for capital formation and human-capital investment yields stronger and more persistent gains in household incomes, labour productivity, and welfare than a steady expansion of open-ended UCTs. While the Centre's incentives have supported higher State capital outlays in recent years, sustaining growth will depend on complementary discipline within revenue expenditure, so that short-term income support does not erode the very investments on which inclusive, medium-term prosperity ultimately rests.

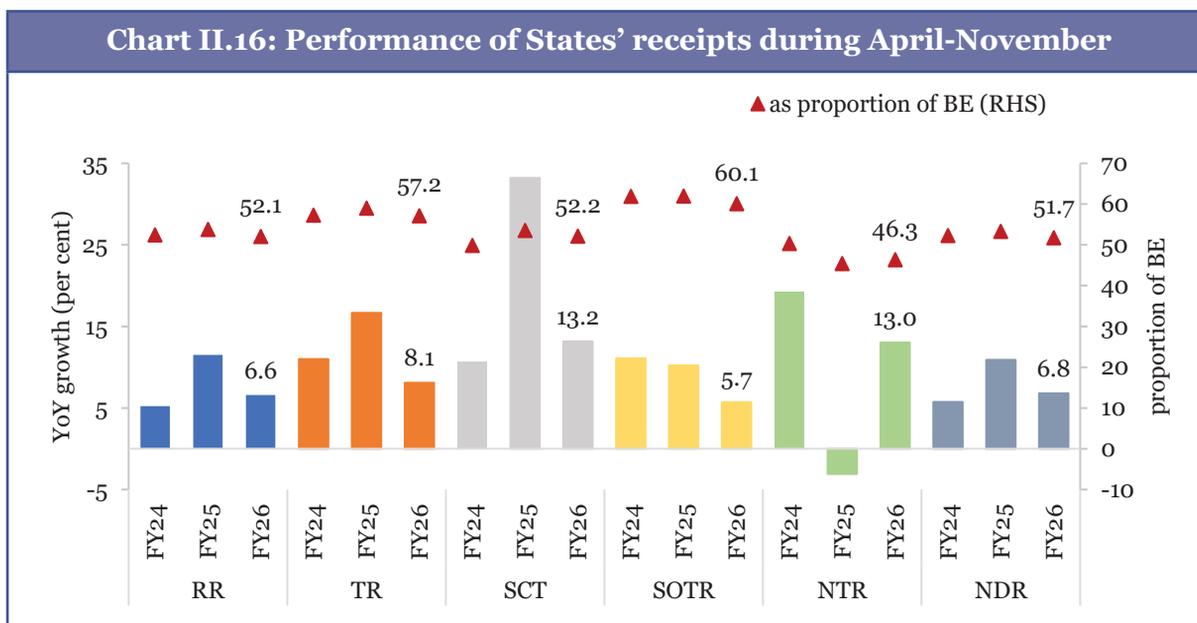
## Trends in State's receipts and expenditures in FY26

2.42 During the current fiscal year (as on end November 2025), the revenue collection as a proportion of budget estimates has shown a moderation (Chart II.16) compared to the previous two years across most of the major categories of revenue (Chart II.17).<sup>38</sup> The combined revenue receipts of the states have grown at a rate of 6.6 per cent during the first eight months of the year, which is lower than the YoY growth of the previous year.

36 Cepaluni, Gabriel, Aline C. Dorsch, and Mauricio M. Branyiczki. 2024. "The Impact of Bolsa Familia on Education Outcomes." *World Development* 173: 106393. <https://doi.org/10.1016/j.worlddev.2023.106393>.

37 Fiszbein, A., & Schady, N. (2009). *Conditional cash transfers: Reducing present and future poverty*. World Bank.

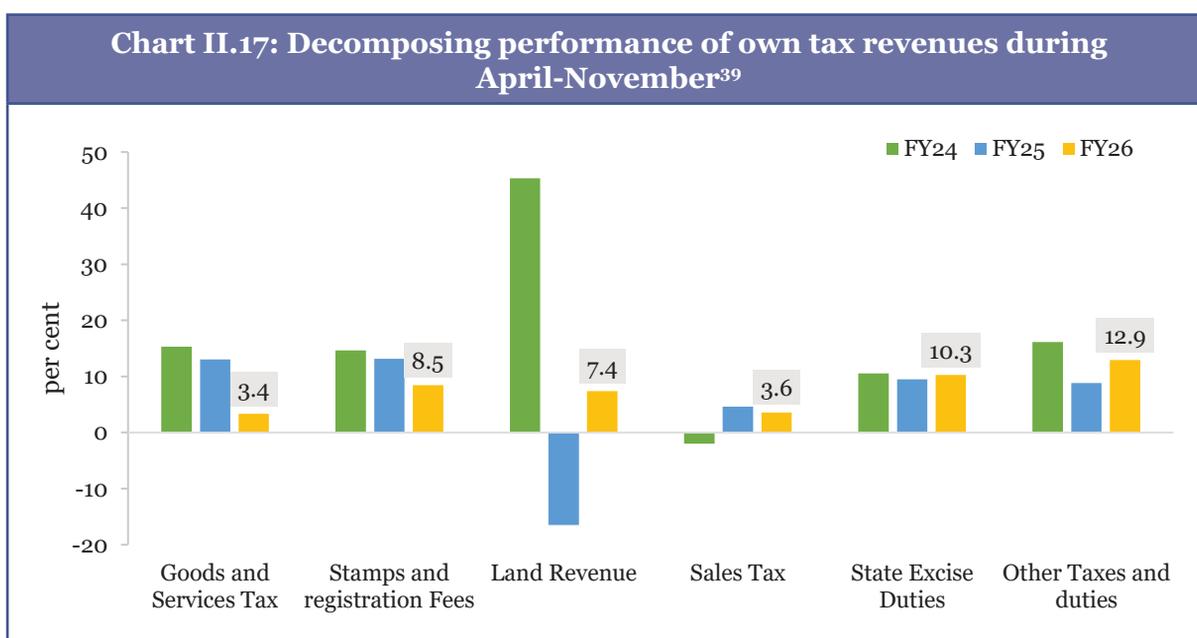
38 Provisional unaudited accounts of 27 States. AP, AS, BR, CG, GJ, HR, HP, JH, KA, KL, MP, MH, ML, MZ, OD, PB, RJ, SK, TN, TS, TR, UP, UK, WB – April to November; BR, SK – April to October; MN, NL- April to September; AR- April to August.



Source: CAG monthly provisional accounts.

Note:

1. RR stands for Revenue Receipts, TR- Tax Receipts (SCT plus SOTR), SCT- Share in Central Taxes, SOTR- States' Own Tax Revenue, NTR- Non Tax Revenue, NDR- Non debt receipts.
2. For Mizoram and Sikkim, SCT is included in SOTR.



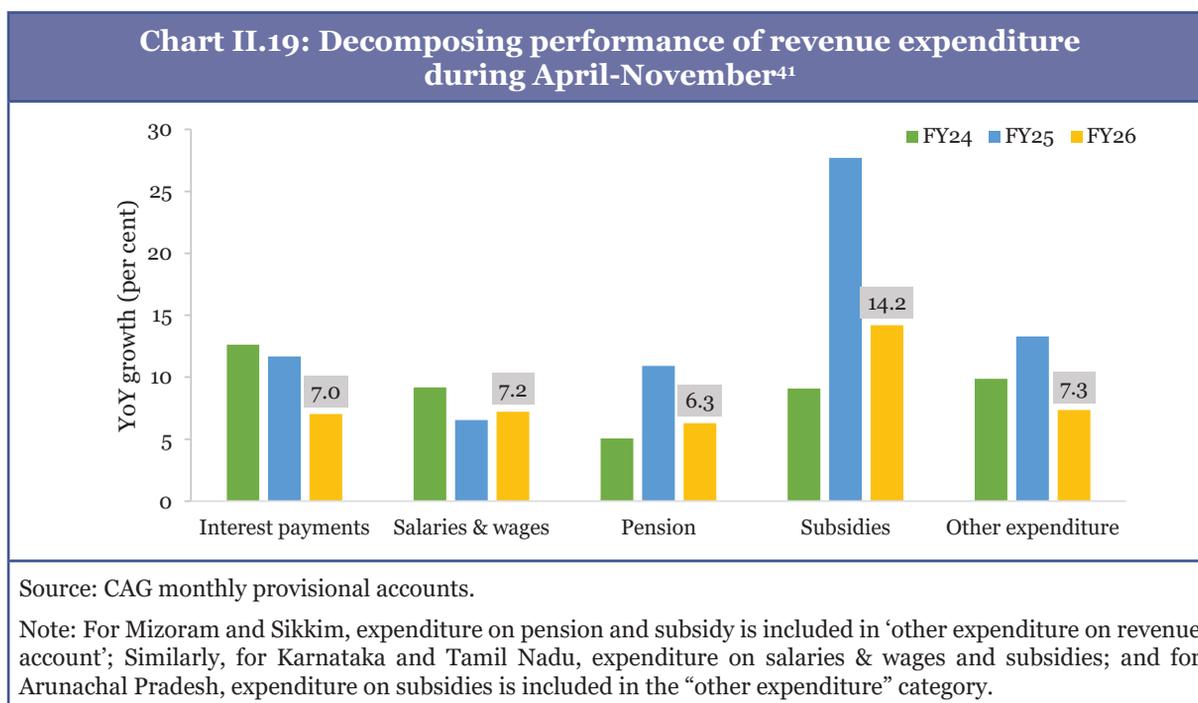
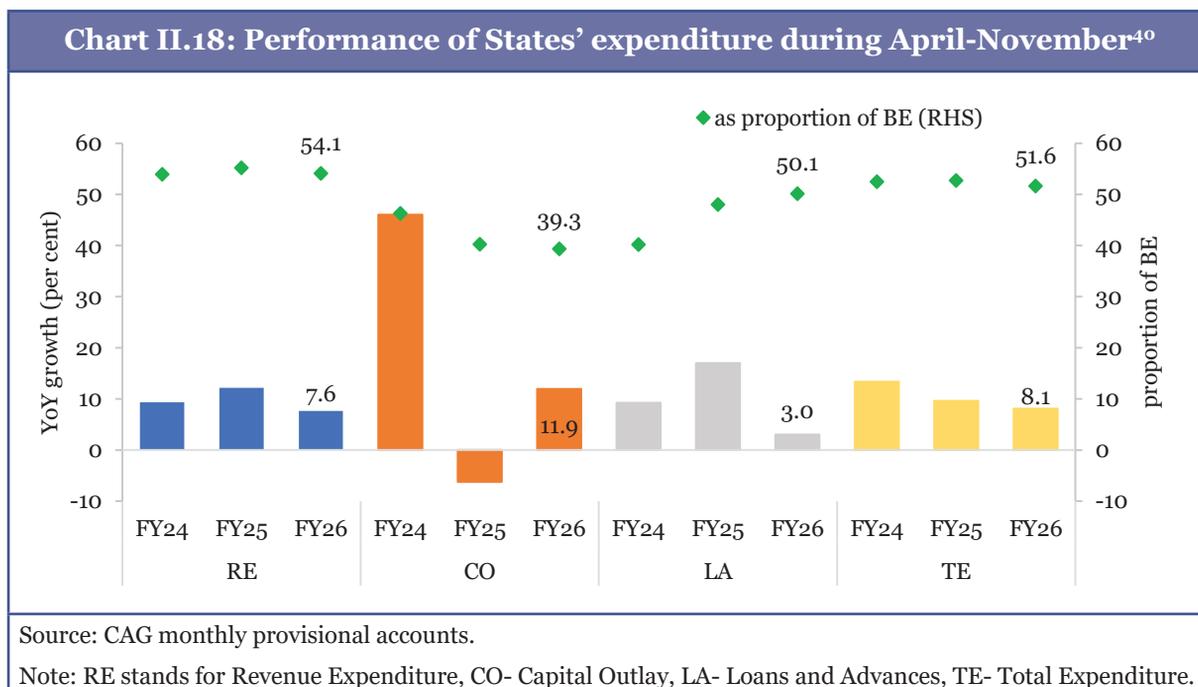
Source: CAG monthly provisional accounts.

Note: For Himachal Pradesh, land revenue included 'other taxes and duties'.

2.43 On the expenditure front, YoY increase in revenue expenditure has been contained at 7.6 per cent in FY26 as at the end of November 2025, lower than the YoY growth of the previous year (Chart II.18). Interest, pension and subsidy payments have seen the highest

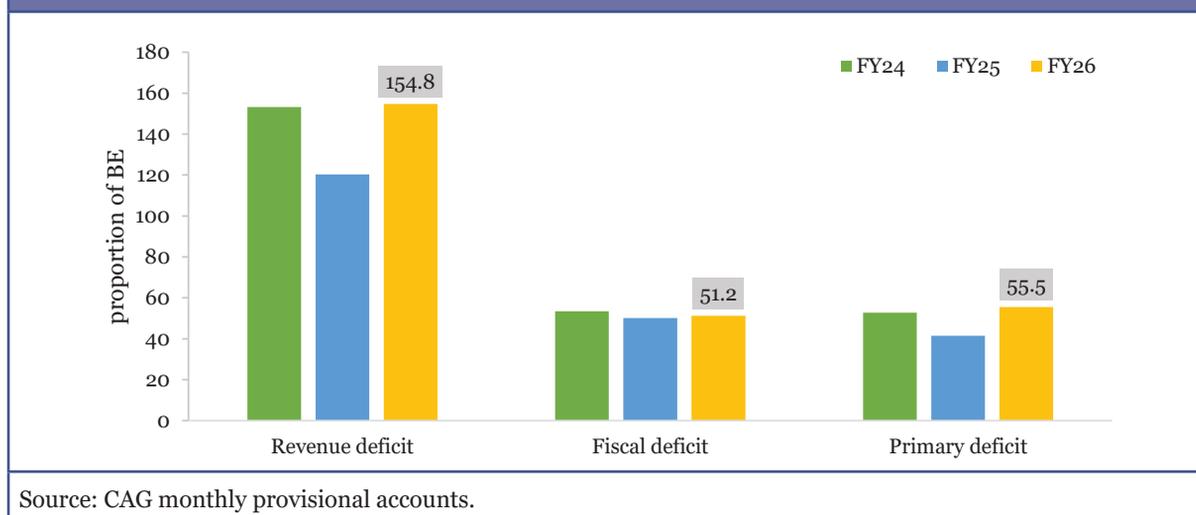
<sup>39</sup> See footnote 38.

compression in revenue expenditure (Chart II.19). The shortfall in receipts has however, outpaced the moderation in expenditure, leading to a sharp overshoot in the revenue deficit to 155 per cent of BE as at the end of November 2025 (Chart II.20). Further, the states' capital outlay shows a rebound with a growth of 11.9 per cent YoY, but it lags in terms of progress against budgeted estimates and as compared to FY24.



40 ibid.

41 ibid.

Chart II.20: Deficit indicators as on end November<sup>42</sup>

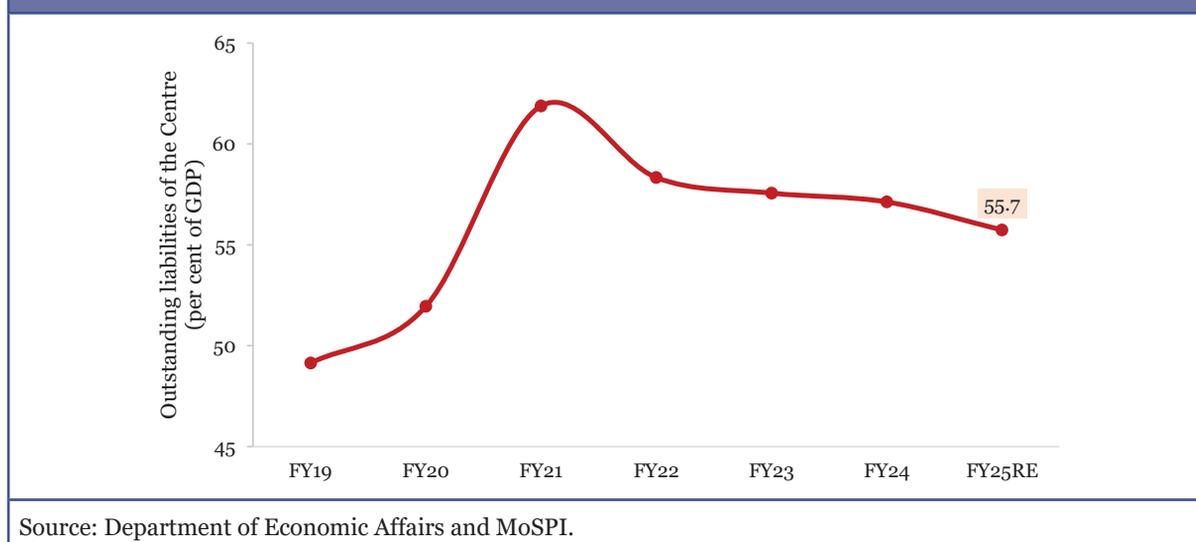
## DEBT PROFILE OF THE GOVERNMENT

### Central Government Debt

#### Strategy to lower cost, mitigate risks and support G-Sec markets

2.44 The Central Government's debt management strategy is anchored in three guiding principles: maintaining a low and stable cost of borrowing, mitigating risks associated with maturity (rollover risk), interest rates and currency exposure, and supporting the development of government securities markets. Since the pandemic, the gradual consolidation of debt has reinforced the credibility of fiscal policy, even as global public debt levels have continued to rise. The Government's medium-term goal to achieve a debt-to-GDP ratio of  $50 \pm 1$  per cent by FY31 reflects a deliberate effort to strengthen overall debt sustainability while preserving policy flexibility in an uncertain global environment. Box II.8 provides a detailed discussion of the fiscal policy framework for the Central Government.

Chart II.21: Centre's debt trajectory



<sup>42</sup> *ibid.*

### Box II.8: Fiscal policy framework for the Central Government

In the year of the pandemic, the fiscal deficit of the Central Government reached 9.2 per cent of GDP, partly on account of pandemic-related and induced expenditure and to a determination to bring below-the-line budget expenditures above the line. It also aimed to draw a line under such practices in the future. At the time, the finance minister committed to reducing the Central Government's fiscal deficit ratio by at least half in five years. The government has targeted a fiscal deficit of 4.4 per cent for FY26 and is on course to achieve it, thus fulfilling the commitment made in FY21. It is noteworthy that the government was determined to and succeeded in bringing down the fiscal deficit ratio as promised, despite it not being a legislative target, even while improving the quality of fiscal expenditure with a concurrent emphasis on capital expenditure. Among other things, the conservative and prudent approach to fiscal management, which enhanced fiscal credibility, led to India's sovereign rating upgrades by several credit rating agencies in FY26.

In the FY26 budget announced in February 2025, the government outlined a new fiscal glide path, aiming to reduce the Central Government's debt-to-GDP ratio to around 50 per cent by FY31. The choice of the debt-to-GDP ratio as the fiscal anchor was consistent with global thinking. It was also considered a more reliable measure of the government's fiscal performance, as it captures the cumulative effect of past and current fiscal decisions.

There is a perception that the government should consider reinstating the Fiscal Responsibility and Budget Management (FRBM) framework, first enunciated in 2003 as the FRBM Act, and commit to a fiscal deficit target of 3 per cent of GDP for the Central Government. While it appears prima facie appropriate, in the highly uncertain current global environment, it is important to retain greater policy freedom and commit to targets that the government can deliver on. Since the FRBM Act was first enacted in 2003, the 3 per cent target has been achieved only once. This eroded India's fiscal credibility, and it has taken five years of sustained commitment to fiscal prudence post-Covid to win back the trust of financial markets and credit-rating agencies. It is important to retain that trust.

In this regard, the new fiscal policy framework has announced a debt ratio target of  $50 \pm 1$  per cent by 31st March 2031, which meets the requirements. It is a concrete commitment with a specific date. Yet it affords the government flexibility to fine-tune fiscal policy in response to emerging needs in the intervening period, in a volatile and unpredictable geopolitical and geoeconomic environment. Once the current target is met and fiscal deficits decline gradually, a new FRBM target may be considered at the end of the Sixteenth Finance Commission period. A return to a rule-based regime will likely be credible and durable if ushered in after a period of lower global macro uncertainty and after debt and/or deficit ratios come meaningfully closer to 50 per cent or 3 per cent of GDP, respectively.

## Low Cost of Borrowing and Strategic Issuance

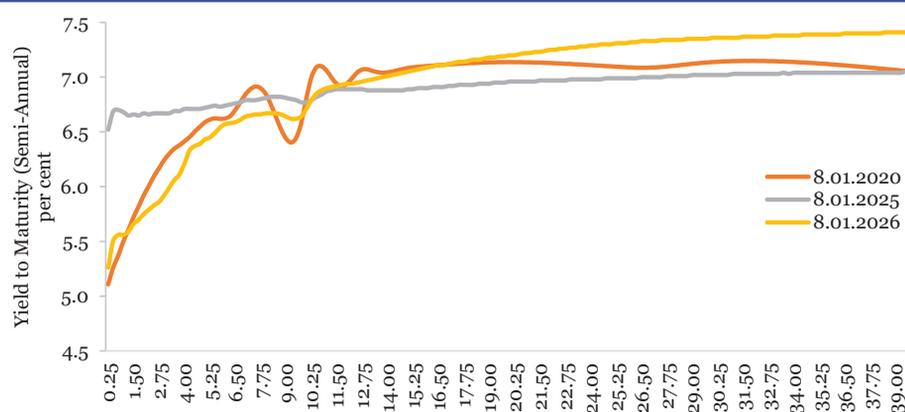
2.45 Fresh debt issuance has been carefully calibrated to meet financing needs while considering the absorptive capacity of the market and containing the borrowing costs. Marketable securities, including dated securities and treasury bills, form the bulk of

government liabilities (around 65 per cent)<sup>43</sup>. This composition has enabled effective transmission of domestic macro-financial conditions to government borrowing costs, which have benefited from favourable domestic conditions, including easing inflation, strong growth, and supportive liquidity.

2.46 During the year, the primary auctions for Government securities were largely conducted smoothly in line with the notified borrowing calendar. Nearly half of the issuances (about 47 per cent of total issuances) were concentrated in bonds maturing beyond 10 years. This provided the necessary support for managing rollover risk. Overall, the weighted average maturity (WAM) of borrowings stood at about 19.14 years in FY26 so far, compared with 20.66 years in FY25. The weighted average coupon (WAC) of fresh issuances during FY26 (as on 19 January 2026) has declined to 6.65 per cent as compared to 7.11 per cent in FY25. Over the longer term, the weighted average coupon on outstanding debt has fallen from 7.71 per cent in FY20 to 7.25 per cent in FY25.

2.47 As on 8 January 2026, the sovereign bond yield curve has a steeper profile, marked by a jump in yields in the medium to longer maturities, while short-term rates fell in response to the policy rate cuts similar to the scenario in January 2020. Given global uncertainties and reduced demand for longer-maturity bonds by domestic institutional investors due to portfolio rebalancing, yields on long-dated securities increased, further widening term spreads. Despite volatile global conditions, the weighted average yield on new government securities declined from 7.14 per cent in Q1 FY25 to 6.48 per cent in Q1 FY26. Strategic issuance across maturities, supported by active cash and liquidity management, has helped smooth borrowing costs and limit yield volatility. The weighted average borrowing cost of G-secs issued in FY26 stands at 6.65 per cent so far compared to 6.96 per cent in FY25.

**Chart II.22: Yield curve of government securities**



Source: Financial Benchmarks India Pvt. Ltd. (FBIL).

<sup>43</sup> Marketable securities constitute 65.6 per cent of the outstanding batch of government liabilities as published in the Union Budget and 64.6 per cent as per FRBM-based accounting.

2.48 Rollover, interest rate, and foreign currency risks have been effectively contained through a prudent debt management strategy. Rollover risk has been reduced by consciously elongating maturities, supported by switch and buyback operations, with the weighted average maturity of fresh issuances remaining around 19 years, and that of outstanding dated securities rising to 13.66 years in FY25. Consequently, only 27.0 per cent of outstanding debt is set to mature over the next five years, implying an average annual rollover of about 5.4 per cent, indicating manageable refinancing needs. Interest rate risk has been limited by maintaining a predominantly fixed-rate debt profile, with floating-rate debt accounting for just 4.1 per cent of outstanding debt at end-FY24, ensuring predictability of interest costs. Foreign currency risk remains low due to the country's reliance on domestic currency borrowing, with external debt accounting for a small share of liabilities, (approximately 2.6 per cent of GDP) largely sourced from multilateral institutions on long-term, concessional terms, thereby insulating public debt from exchange rate and external shocks.

## States' Debt

2.49 The debt-GSDP ratio and the interest payments to revenue receipts (IP/RR) ratio are key variables in assessing the fiscal health of States. A sustainable level of debt helps promote intergenerational equity, especially when it finances investments. Similarly, a relatively lower IP/RR ratio allows for greater fiscal space in undertaking productive expenditure, catering to other committed expenditure and maintaining revenue balance. The combined debt-GSDP ratio of States and UTs has been on an increasing trajectory in the last decade. After peaking during the COVID-19 pandemic, it experienced consolidation, culminating in a slight uptick in FY25. For 28 States combined, while the debt-to-GDP ratio is 28.1 and the interest payments-to-revenue receipts ratio is approximately 12.6 for FY25(PA), there exists considerable variation on both fronts across States.

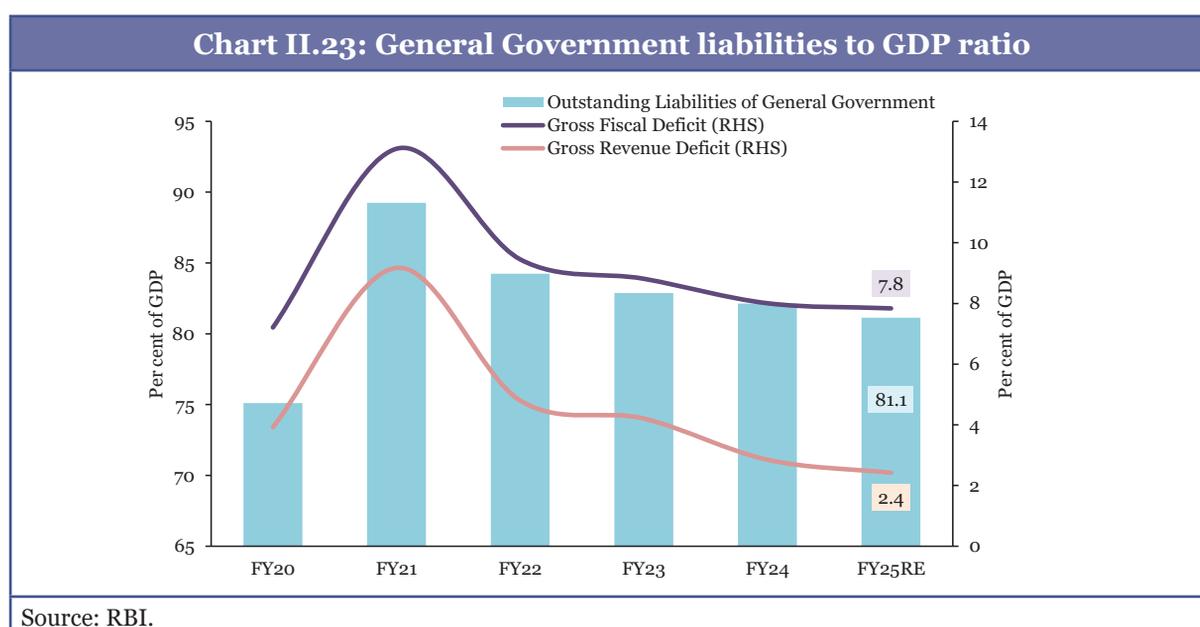
2.50 While debt-GSDP and IP/RR ratios highlight wide differences in fiscal health across States, these differences are not yet adequately reflected in State borrowing costs. Evidence from the State Development Loan (SDL) market<sup>44</sup> indicates that SDLs are predominantly held by domestic institutions, with limited secondary market trading. States have increasingly shifted from standard 10-year SDL issuances to a wider range of longer maturities. However, secondary market trading continues to reflect state-specific preferences rather than meaningful risk-based price differentiation. There appears to be only a weak differentiation between SDL coupons and fiscal health. In other words, borrowing costs do not sufficiently reward fiscally stronger States or penalise weaker ones. In this context, the XV-FC has emphasised the disclosure of States' financial positions, which would allow markets to better assess and price State-specific credit risk.

44 Quarterly report (January-March, 2025), Clearing Corporation of India Ltd. (CCIL).

This can be achieved by improving the timeliness, granularity, and standardisation of State-level fiscal data, particularly on off-budget liabilities, guarantees, and contingent risks. Broadening the investor base and enhancing secondary market liquidity would lead to better pricing of SDLs.

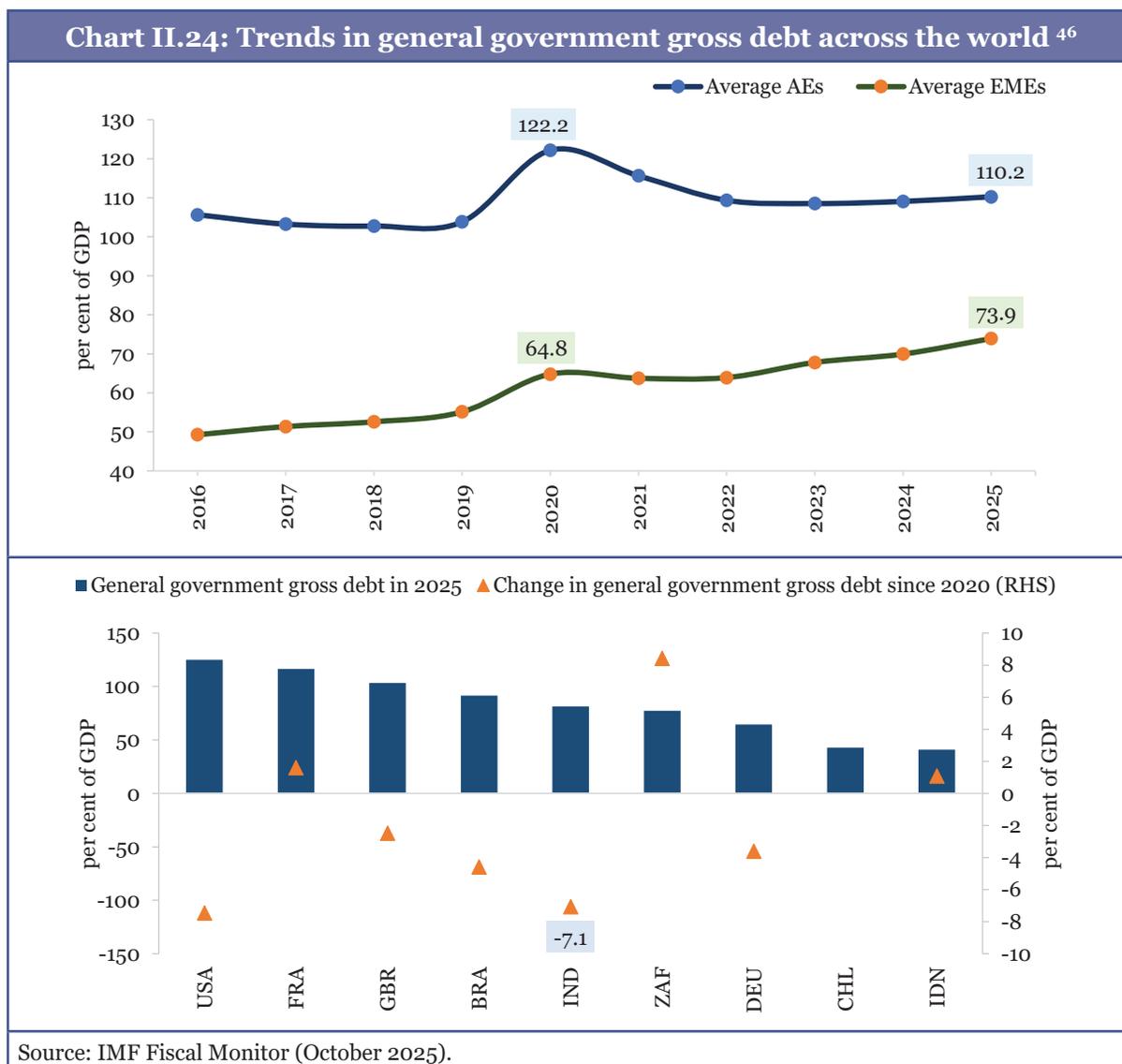
## GENERAL GOVERNMENT FINANCES

2.51 General government finances provide an overview of the fiscal position of the centre and states, when taken together and after netting out certain central transfers. Mirroring trends in central government debt, general government deficits and liabilities, which remained above pre-pandemic levels, have followed a consolidation path in the post-pandemic period. As the Central Government continues fiscal consolidation over the medium term, the general government is also expected to remain on a consolidation trajectory.



2.52 Globally, general government debt ratios remained elevated in the post-pandemic period, with advanced economies (AEs) continuing to carry structurally higher debt burdens than emerging market economies (EMEs)<sup>45</sup>. While AEs deployed larger counter-cyclical support during the pandemic and have since seen only limited debt unwinding, EMEs face persistent fiscal pressures and more constrained adjustment space. Against this backdrop, India stands out among large emerging economies. Despite starting from a higher-than-average EME debt level, India has reduced its general government debt-to-GDP ratio by about 7.1 percentage points since 2020 (Chart II.24), even as growth momentum has been sustained. This places India closer to the post-pandemic consolidation path observed in AEs, underscoring that prudent, growth-friendly fiscal consolidation is achievable under challenging global conditions.

<sup>45</sup> IMF Fiscal Monitor (October 2025).



2.53 Sustainable public debt is crucial for macroeconomic growth. It enables governments to leverage borrowings to finance investments that increase productivity, attract private capital, and generate higher tax revenues, creating a virtuous cycle that also helps expand the production frontier. The Economic Survey of India 2020–21 (Volume 1, Chapter 2: “Does Growth Lead to Debt Sustainability? Yes, But Not Vice Versa!”)<sup>47</sup> illustrates this mechanism for India, showing that sustained high growth has historically delivered a favourable interest-rate–growth differential, keeping the debt-to-GDP ratio stable, while undertaking fiscal consolidation when warranted. Barro (1990)<sup>48</sup> showed theoretically and empirically that debt-financed productive government spending (especially on core

46 BRA-Brazil, CHL-Chile, FRA-France, DEU-Germany, IND-India, IDN-Indonesia, ZAF-South Africa, GBR-United Kingdom, USA-United States of America.

47 <https://tinyurl.com/ybhtc8kr>.

48 Barro, R. J. (1990). Government Spending in a Simple Model of Endogenous Growth. *Journal of Political Economy*, 98(5), S103–S125. <https://tinyurl.com/pjpu94nt>.

infrastructure) permanently raises the steady-state growth rate by increasing the marginal product of private capital. In this context, a debt sustainability analysis for India, based on the fiscal response function (FRF), is presented in Box II.9.

### Box II.9: Is General government debt sustainable? – evidence from a fiscal response function

The modern testing of debt sustainability rests on the fiscal response function (FRF), pioneered by Henning Bohn (1998)<sup>49</sup>. Using over a century of U.S. data, Bohn showed that if the primary surplus-to-GDP ratio rises systematically with the lagged debt-to-GDP ratio ( $\beta > 0$ ), fiscal policy is sustainable regardless of whether interest rate ( $r$ ) > nominal GDP growth ( $g$ ). This insight shifted the focus from arbitrary debt thresholds to governments' actual behaviour. Subsequent landmark contributions include Ghosh et al. (2013)<sup>50</sup>, who introduced nonlinear (cubic) specifications and the concept of “fiscal fatigue” and “fiscal space” in advanced economies; Mauro et al. (2015)<sup>51</sup>, who documented time-varying and occasionally pro-cyclical responses across a broad global panel; and Checherita-Westphal and Ždarek (2015)<sup>52</sup>, who highlighted how EU institutional rules and crises altered the strength and symmetry of fiscal reactions in euro-area countries.

To assess the sustainability of debt in the Indian context, the following specification has been employed to estimate the fiscal response function for general government in India, for the period 1981 to 2024 drawing from Bohn's work:

$$Pb_t = d_{t-1} + yvar_t + gvar_t + dummy_t + \varepsilon_t$$

Where ‘ $pb_t$ ’ is the primary balance relative to GDP, with a positive value indicating a primary surplus and a negative value implying a primary deficit. ‘ $d_{t-1}$ ’ is the debt-GDP ratio lagged one period. ‘ $yvar$ ’ is the output gap and ‘ $gvar$ ’ is the government spending gap, estimated using the Hodrick-Prescott filter. ‘ $Dummy$ ’ is the dummy variable to factor in conscious fiscal consolidation years, such as post the 1991 reforms, and the implementation period of the Fiscal Responsibility and Budget Management Act before the Covid-related easings. Following Bohn, the FRF is intentionally estimated in levels, since the economic meaning of sustainability resides in levels, and not in differences. Further, since debt is highly autocorrelated and the error term often exhibits moving-average serial correlation, Newey-West heteroskedasticity- and autocorrelation-consistent (HAC) standard errors are employed.

The estimated fiscal response function provides clear evidence that India's fiscal policy has been sustainable in the Bohn (1998) sense. On average, an increase in the lagged public debt-

49 Bohn, H. (1998). The behavior of U. S. public debt and deficits. *The Quarterly Journal of Economics*, 113(3), 949–963. <https://doi.org/10.1162/003355398555793>.

50 Ghosh, A. R., Kim, J. I., Mendoza, E. G., Ostry, J. D., & Qureshi, M. S. (2013). Fiscal fatigue, fiscal space and debt sustainability in advanced economies. *The Economic Journal*, 123(566), F4–F30. <https://doi.org/10.1111/eoj.12010>.

51 Mauro, Paolo & Romeu, Rafael & Binder, Ariel & Zaman, Asad, 2015. "A modern history of fiscal prudence and profligacy," *Journal of Monetary Economics*, Elsevier, vol. 76(C), pages 55-70. <https://tinyurl.com/s52zmhrc>.

52 Checherita-Westphal, C., & Ždarek, V. (2015, June 17). Fiscal reaction function and fiscal fatigue in the euro area [Conference paper]. EUROFRAME Conference. <https://tinyurl.com/y8x5h2dh>.

to-GDP ratio induces an improvement in the primary balance-to-GDP ratio. This signals that Indian fiscal policy has historically been responsive to debt accumulation: when debt rises, policymakers eventually adjust revenues or non-interest expenditures to stabilise or reduce it. The strongly positive coefficient of  $yvar$  indicates counter-cyclical fiscal behaviour, wherein primary balance improves significantly when output is above trend, consistent with automatic stabilisers. Interpretation for  $gvar$  can be understood as follows - when the government spending gap ( $gvar$ ) rises, it reflects a surge in total expenditure above the trend. Consequently, the fiscal deficit increases, causing the primary balance to fall into a deficit (represented by a negative coefficient of  $-0.709$ ). This indicates that temporary spending spikes are deficit-financed, i.e., the government chooses to fund these extras through a "hole in its own purse" rather than through other measures like a rise in taxation. However, this behaviour remains sustainable because of the positive coefficient for lagged debt ( $d_{t-1}$ ), which shows that the long-term corrective response to rising debt ensures that these temporary primary deficits do not lead to an infinite debt spiral. The large positive coefficient of the dummy variable indicates that institutional reforms and explicit fiscal rules have significantly induced fiscal discipline, as reflected in the strengthening of primary balances.

**Table II.9: Regression results**

Variable	Coefficient
$d_{t-1}$	0.063** (0.03)
$yvar_t$	0.355*** (0.09)
$gvar_t$	-0.709** (0.33)
$dummy_t$	1.548*** (0.47)
Intercept	-8.14*** (2.1)
Number of observations	43
F-statistic (overall)	11.36
Newey-West standard errors are reported in parenthesis. levels of significance: *** is 0.01, ** is 0.05.	

2.54 India's fiscal model stands out particularly when assessed through the lens of public investment efficiency. In FY24, general government investment was 4 per cent of GDP, amounting to about one-fifth of total government revenue, much higher than in most peer economies. When OECD countries were at income levels similar to India today, their general government investment was about 2 to 5 per cent of GDP, even though

their tax revenues were in the range of 20 to 28 per cent of GDP<sup>53</sup>. A relatively higher revenue to public investment ratio, reflects India's clear focus on growth-enhancing capital expenditure.

**Chart II.25: General government - investment allocation from revenues**



Source: MoSPI, IMF Fiscal Monitor (October 2025), IMF Government Finance Statistics and OECD.

Note: General government investment for India is of FY24.

## CONCLUSION AND OUTLOOK

2.55 India's recent fiscal performance reflects a careful balancing of growth imperatives and fiscal prudence. Strong macroeconomic fundamentals have been reinforced by a calibrated fiscal strategy that prioritised capital expenditure while steadily consolidating deficits and debt. The Centre's commitment to a transparent and credible medium-term debt glide path has enhanced policy credibility, providing fiscal space and flexibility to respond to evolving domestic and global conditions without undermining stability.

2.56 State governments have also made progress in recent years, particularly in scaling up capital expenditure and strengthening their own revenue mobilisation. However,

<sup>53</sup> Share of general government investment in GNP by France, Japan, US and Italy was 3.4 per cent, 5 per cent, 3 per cent and 2.4 per cent, respectively (source: OECD Economic Survey – Japan 1972. <https://tinyurl.com/2pf4a23u>). As per IMF's public finances in modern history and World Bank's world development indicators' database, general government revenue to GDP ratios for OECD countries at middle-income per capita GDP levels (US\$2,000-US\$3,000 in current prices, comparable to India's current per capita GDP trajectory) typically ranged about 20 per cent to 28 per cent per cent of GDP during 1960-1985. For instance, France averaged 20-21 per cent in the late 1960s (per capita GDP US\$2100-US\$2800), Japan ~22-23 per cent in the early 1970s (per capita GDP US\$2100-US\$3000); the US ~28 per cent in 1960 (per capita GDP US\$3000); Italy ~29-30 per cent in early 1970s (per capita GDP US\$2100-US\$2700); and Portugal ~23-25 per cent in the late 1970s (per capita GDP US\$2000-US\$2800).

emerging trends in State-level debt and deficits underscore the need for continued calibration. The recommendations of the Sixteenth Finance Commission will play a critical role in shaping Centre-State fiscal relations, influencing the quantum and composition of resource transfers, and thereby affecting State-level fiscal outcomes. At the same time, the increasing reliance by some States on unconditional cash transfer programmes has altered expenditure composition, raising concerns about expenditure rigidity and medium-term fiscal flexibility. While such transfers serve important distributional objectives, their scale and design need to be balanced against the imperative of preserving space for growth-enhancing investments. Improved targeting, periodic review, and outcome-oriented design can help mitigate fiscal rigidities.

2.57 From a macro perspective, any fiscal indiscipline at the State level also casts a shadow on the sovereign borrowing costs. With markets pricing government debt on a consolidated basis, persistent revenue deficits or an expansion of committed expenditures at the State level could affect sovereign bond yields. This underscores the importance of coordinated fiscal discipline across levels of government, where fiscal policy is oriented toward expanding productive capacity and income growth rather than creating permanent expenditure commitments. Strengthening the fiscal capacity of local bodies, in line with constitutional intent, can also help improve expenditure efficiency and investment outcomes at the grassroots level.

2.58 Looking ahead, ongoing reforms in taxation, including GST 2.0 and personal income tax, are expected to enhance the efficiency of the tax system by simplifying structures, reducing compliance costs, and broadening the tax base, with implications for both economic activity and revenue mobilisation. In parallel, wider use of digital systems in tax administration and public financial management is likely to strengthen compliance, improve expenditure disbursements, and enhance fiscal transparency. Together, these measures will enable progress along the medium-term debt path, thereby strengthening macroeconomic stability.

\*\*\*

# MONETARY MANAGEMENT AND FINANCIAL INTERMEDIATION: REFINING THE REGULATORY TOUCH

*India's monetary and financial sectors have exhibited robust performance in FY26 (April-December 2025), underpinned by strategic policy actions and structural resilience across financial intermediation channels. In response to moderating inflation, the Reserve Bank of India's Monetary Policy Committee reduced the repo rate, while injecting durable liquidity through cash reserve ratio cuts and open market operations. These measures have been effectively transmitted to lending rates, with the weighted average lending rates of scheduled commercial banks declining. The banking sector has simultaneously strengthened its fundamentals, with gross non-performing asset ratios declining to multidecadal lows and profit after tax increasing, signalling improved asset quality and profitability.*

*Capital formation has been particularly robust in primary equity markets. Household financial savings have increasingly shifted towards equities and mutual funds, with the share of equity-linked instruments in annual household savings rising, reflecting the deepening financialisation of domestic savings.*

*Financial inclusion has advanced substantially through digital public infrastructure, fintech lending, and government-led microcredit initiatives. India's first international financial service centre at GIFT City is creating an enabling ecosystem for attracting and channelling global capital. Significant strides have been made in providing social security cover to citizens in terms of pension and insurance.*

*While India's financial system is becoming more resilient, diversified, and inclusive, it faces new challenges emanating from dynamic forces. These challenges include the need to improve regulations, manage the use of AI in finance, and scale up to meet the demands of a growing, aspirational population. This necessitates that the regulatory authorities navigate prudently to reconcile growth with stability.*

## INTRODUCTION

3.1 Monetary management and financial intermediation are fundamental pillars of the economic structure, driving growth, stability, and financial inclusion. Monetary management, led by the Reserve Bank of India (RBI), involves regulating the money

supply, interest rates, and liquidity to ensure price stability while supporting sustainable economic growth. It also directly influences financial stability. Effective policy transmission through the banking and financial sector ensures that changes in interest rates and liquidity conditions are efficiently transmitted to businesses and households. This stability is crucial for sustaining growth and preventing financial crises, as a stable financial system enables the smooth allocation of resources and fosters economic resilience in the face of global and domestic shocks.

3.2 The vastly interconnected global financial architecture of today was built and developed in the era of rapid globalisation. Globalised finance has led to lower borrowing costs, greater access to capital, and improved international risk sharing.<sup>1</sup> However, in the presence of rapid geopolitical fragmentation, the financial sector has become a channel for the transmission of global shocks. Thus, emerging markets face the task of leveraging the benefits of globalised finance and simultaneously minimising the costs that stem from volatile shocks. In this context, regulatory innovation, transparency, and accountability are crucial for addressing the challenges of an uncertain era. Moreover, tapping into innovative and inclusive channels of domestic finance is necessary, as these can serve as a buffer against shocks to volatile global finance and simultaneously advance the goals of growth and development.

3.3 This chapter outlines the trends in India's financial sector against the backdrop of these global developments. The chapter begins with an exploration of trends in the global financial sector. Subsequently, the next section provides a comprehensive overview of key developments in the monetary sector in India. This is then followed by sections which cover various aspects of the financial sector, including banking, capital and debt markets, foreign portfolio investments, pensions, and insurance. In view of the agile responses demonstrated by regulators across the financial sector, the chapter places specific emphasis on regulatory achievements and on the role of financial sector regulators in maintaining stability while identifying areas requiring improvement. The chapter concludes with a financial sector outlook, highlighting the key challenges that lie ahead.

## **GLOBAL FINANCIAL MARKETS – UNCERTAINTY AND OTHER EMERGING RISKS**

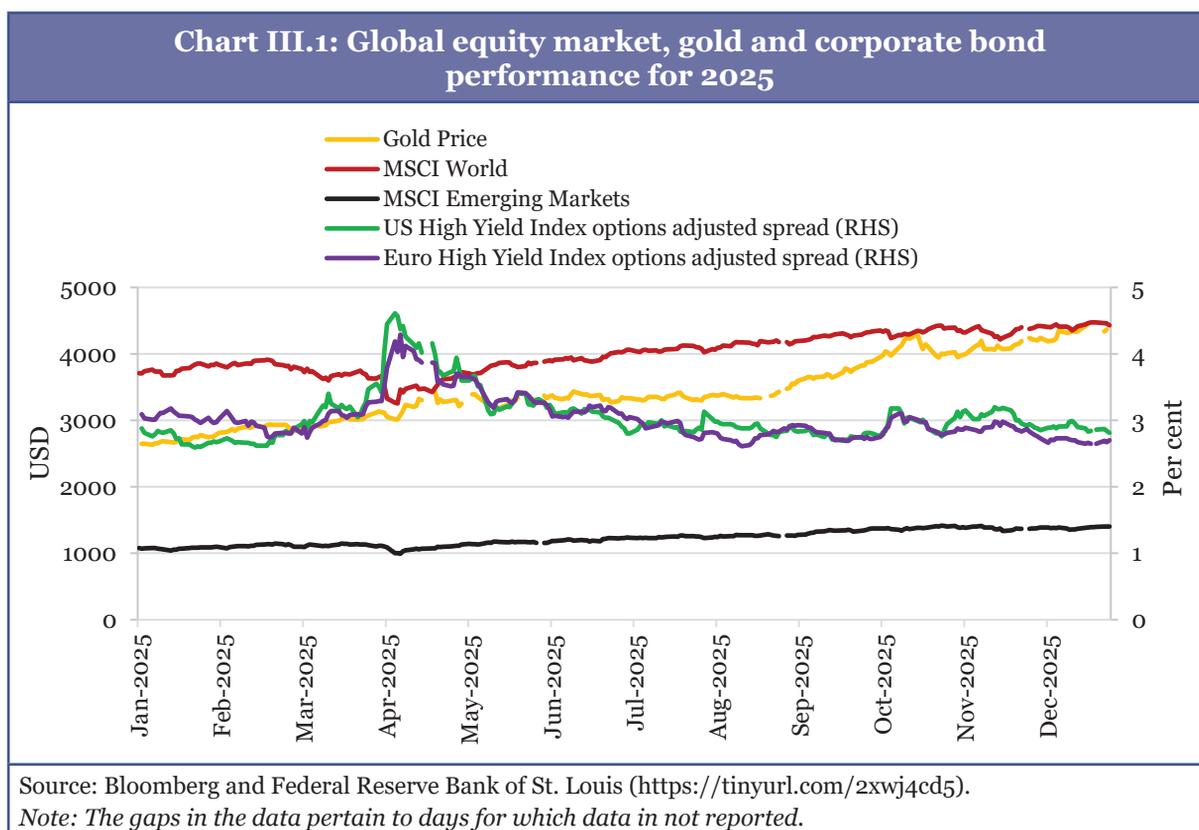
3.4 Financial markets are typically the first to register and absorb the impact of an uncertainty shock. Much before agents across government, trade, and households adjust their choices, financial market participants tend to respond by pricing in uncertainty

---

<sup>1</sup> Kose, M. A., Prasad, E., Rogoff, K., & Wei, S.-J. (2006). Financial globalization: A reappraisal (IMF Working Paper No. WP/06/189). International Monetary Fund, <https://tinyurl.com/mwu2t34a>.

risk in real time. The year 2025 was marked by heightened uncertainty, which had a palpable impact on financial markets.

3.5 The first half of calendar year (CY) 2025 saw the global financial markets reacting to the tariff announcements by the US government. Global policy uncertainty increased following the announcement, prompting investors to reduce their exposure to the US Dollar (USD) and seek safe-haven assets, such as gold. Global equity markets dipped, and risk premiums rose across asset classes in April 2025. (Chart III.I). Subsequently, financial market volatility subsided and returned to normal once some of the US government's announcements were reversed.



3.6 The impact of uncertainty on financial markets is not just limited to a rise in volatility and risk premia. Research shows that prolonged periods of uncertainty can affect the financial sector through at least three key channels. First, financial market participants are seen to defer decisions in the presence of uncertainty (via the real options channel). A rise in uncertainty will trigger a ‘wait-and-see’ sentiment, delaying investments and capital formation (Dixit & Pindyck, 1994).<sup>2</sup> Second, heightened uncertainty can raise the cost of finance through a rise in credit spreads (Manzo, 2013)

<sup>2</sup> Dixit, A. K., and R. S. Pindyck. (1994) Investment under Uncertainty. Princeton University Press.

and financial intermediation costs (Francis, Hasan & Zhu, 2014).<sup>3,4</sup> In turn, this can impact the real economy by impeding the flow of credit. Finally, prolonged uncertainty can increase the possibility of sharper market corrections across asset classes.<sup>5</sup> In some cases, these market corrections can pave the way for financial contagion, spreading to the entire financial sector and the real economy.

3.7 In addition to the above risks, global financial markets grapple with the impact introduced by new technologies such as artificial intelligence (AI). The IMF's Financial Stability Report (FSR) of October 2025 notes that there is a higher likelihood of herding behaviour in financial markets, as global investors use similar AI models. The report also notes that, compared to previous decades, investors have become increasingly sensitive to micro-information signals transmitted through social media. These trends suggest the possibility of longer and more amplified shocks in global financial markets. Parallely, technology stocks pose an emerging risk of inflated valuations, with AI-related stocks accounting for 75 per cent of S&P 500 returns, 80 per cent of earnings growth, and 90 per cent of capital spending growth since ChatGPT launched in November 2022.<sup>6</sup> At the same time, as noted by the IMF, structural vulnerabilities such as rising global government debt and aggressive risk-taking among non-bank financial institutions remain capable of intensifying the effects of emerging shocks.<sup>7</sup> At the same time, digital assets such as the Stablecoin are gaining traction and playing a larger role in financial intermediation. As of 31 December 2025, the total market capitalisation of stablecoins stands at USD 305.4 billion, marking a 49.6 per cent increase this year.<sup>8</sup> Stablecoins' rising market capitalisation and increasing interconnections with the traditional financial system have reached a stage where potential spillovers to that system can no longer be ruled out.

3.8 Amidst such uncertainties, it is relevant to understand whether and how firms' investment decisions are affected. Box III.1 empirically estimates the impact of prolonged periods of uncertainty on capital formation by firms in India.

3 Manzo, G. (2013). Political uncertainty, credit risk premium and default risk. *Credit Risk Premium and Default Risk* (August 31, 2013), <http://dx.doi.org/10.2139/ssrn.2376608>.

4 Francis, B. B., Hasan, I., & Zhu, Y. (2014). Political uncertainty and bank loan contracting. *Journal of Empirical Finance*, 29, 281-286, <https://doi.org/10.1016/j.jempfin.2014.08.004>.

5 Catalán, M., Deghi, A., & Qureshi, M. S. (2024, October 15). How high economic uncertainty may threaten global financial stability: Unknowns raise risk of financial market volatility and a sharp decline in economic growth. *International Monetary Fund*, <https://tinyurl.com/5uprvmaa>.

6 Lichtenberg, N. (2025, October 7). 75% of gains, 80% of profits, 90% of capex—AI's grip on the S&P is total, and Morgan Stanley's top analyst is 'very concerned'. *Fortune*, <https://tinyurl.com/y3jjasfe>.

7 International Monetary Fund. (2025, October 14). *Global Financial Stability Report, October 2025: Shifting ground beneath the calm*, <https://tinyurl.com/3fej6p64>.

8 DefiLlama. *Stablecoins (Data dashboard)* <https://tinyurl.com/3yys62da>, accessed on 24 January 2025.

### Box III.1: Capital formation amidst uncertainty shocks - a study of listed firms in India

Uncertainty shocks have become a defining feature of the present era. While these shocks are essentially geopolitical in nature, they also stem from technological shifts and policy changes. This box seeks to understand how capital formation choices of firms in India respond to such shocks.

Literature establishes that firms delay investment in the presence of uncertainty due to factors such as increased costs of financing (Christiano et al., 2014)<sup>9</sup> and a rise in the ‘option value’ of delaying investment (Dixit & Pindyck, 1994).<sup>10</sup> However, in some scenarios, firms may choose to invest despite an uncertain environment. For example, firms in strategic sectors may invest in R&D despite economic uncertainty, anticipating higher future payoffs (Weeds, 1999).<sup>11</sup> Similarly, factors such as asset size, market power, market concentration, and growth opportunities impact a firm’s choice to invest irrespective of uncertainty.<sup>12</sup> Given this heterogeneity, a detailed exploration is warranted to understand how firm investment behaviour in India responds to uncertainty shocks.

There is a wide variety of literature that attempts to model uncertainty, which is, in fact, a latent variable that cannot be directly observed. One category of research uses media coverage to track the frequency of specific keywords related to uncertainty (See, for example, the widely used Economic Policy Uncertainty (EPU) index by Baker and Bloom).<sup>13</sup> A second category frames uncertainty based on qualitative data from forecasters. A third category quantifies uncertainty as a residual, unobserved variable that varies over time.<sup>14</sup>

#### Data and model

The present study covers 811 listed firms in India for the period from 2010 to 2024.<sup>15</sup> The sample comprises a heterogeneous mix of large (63 per cent), mid-sized (28.7 per cent), and small firms (8.3 per cent), operating across diverse sectors ranging from infrastructure and mining to retail and wholesale distribution. Nearly 25 per cent of the firms exhibit a strong

9 Christiano, L. J., Motto, R., & Rostagno, M. (2014). Risk shocks. *American Economic Review*, 104(1), 27-65, <https://tinyurl.com/yxcfedh2>.

10 Ibid note 2.

11 Weeds, H. (1999). “Sleeping Patents and Compulsory Licensing: An Options Analysis.” University of Warwick Economic Research Papers (No. 540).

12 See, for instance, Mohades Forooshani, S. S., Piccillo, G., & Treibich, T. (2024). Unpacking Economic Uncertainty: Measuring the Firm, Sector and Aggregate Components. CESIFO WORKING PAPERS, 10974, <https://tinyurl.com/z9kjfpwd>; Bar-Ilan, A., & Strange, W. C. (1996). Investment lags. *The American Economic Review*, 86(3), 610-622, <https://tinyurl.com/4tj4j8nn>; and Castelnuovo, E., Tuzcuoglu, K., & Uzeda, L. (2022). Sectoral uncertainty, <http://dx.doi.org/10.2139/ssrn.4259631>.

13 Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. *The quarterly journal of economics*, 131(4), 1593-1636, <https://doi.org/10.1093/qje/qjw024>.

14 For a detailed review of the various methods of uncertainty measurement, please refer to Cascaldi-Garcia, D., Sarisoy, C., Londono, J. M., Sun, B., Datta, D. D., Ferreira, T., ... & Rogers, J. (2023). What is certain about uncertainty? *Journal of Economic Literature*, 61(2), 624-654, <https://tinyurl.com/57mryhfn>.

15 Data is sourced from the CMIE Prowess database.

export orientation.<sup>16</sup> The study period encompasses several significant shocks, including the taper tantrum (2013), the twin balance sheet crisis (2016–2018), the COVID-19 pandemic (2020–2021), and heightened global geopolitical tensions (2022–2023).

Uncertainty is modelled as a common unobserved shock affecting all firms at time  $t$ . The study employs a panel SVAR framework (Pedroni, 2013), which offers several advantages for the data under consideration.<sup>17</sup> First, it accommodates unbalanced firm-level panel data. Second, it accounts for potential endogeneity among variables. Third, it captures rich information from a wide cross-section ( $N = 811$ ) despite the relatively short time dimension ( $T = 15$ ).

The impact of uncertainty shocks on capital formation is estimated using the following firm-level equation, where  $i = 1$  to 811:

$$K_{it} = f(\Pi_{it}, \text{Liquidity}_{it}, \text{Borrowings}_{it})$$

Where  $K_{it}$  refers to capital formation, which is captured by the change in net fixed assets of the firm  $i$  at time  $t$ ;  $\Pi_{(it)}$  refers to the profits after taxes,  $\text{Liquidity}_{it}$  is taken as the ratio of cash and bank balances as a share of total assets, and  $\text{Borrowings}_{it}$  is captured by reported firm borrowings. These variables are selected based on firm-level literature on capital formation dynamics (Dhasmana, 2025).<sup>18</sup>

The model treats uncertainty as an unexpected, common shock to profits across all firms in the sample. Firms respond to this shock heterogeneously, as reflected in their individual impulse response functions for capital formation. The 811 individual impulse responses are then studied to construct an overall picture of firm-level capital formation following an uncertainty shock.

### Findings of the study

The main variable of interest - capital formation- is standardised by taking it as a share of a firm's total net fixed assets (NFA). This allows for easier interpretation at an aggregate level. The standardised variable is thus defined as the change in NFA as a share of total NFA ( $K_i / \text{NFA}_i$ ) where  $K_i$  is capital formation following an uncertainty shock and  $\text{NFA}_i$  is a firm's latest NFA position (as of 2024).

The study reveals that an uncertainty shock, on average, induced firms to undertake negative

16 The study classifies a firm as an 'exporter' if its export share of revenue averaged at least 20% across the 15 years studied.

17 Pedroni, P. (2013). Structural Panel VARS. *Econometrics*, 1(2), 180-206. <https://tinyurl.com/yn6edazb>. Pedroni's Panel Structural Vector Autoregressive (SVAR) framework captures the heterogeneity of large  $N$ , small  $T$  samples without introducing any bias into the estimations. Furthermore, it is suited for unbalanced panels and helps model uncertainty as a common latent shock variable across firms. Specifically, using Pedroni 2013's SVAR framework, uncertainty is modelled as follows:

$$\epsilon_{it} = \eta_i \bar{\epsilon}_i + \mu_{it}$$

where  $\epsilon_{it}$  is the white noise shock for an endogenous variable of firm  $i$  at time  $t$ , which is expressed as the sum of a common shock  $\bar{\epsilon}_i$  and an idiosyncratic firm-specific shock  $\mu_{it}$ .

18 Dhasmana, A. (2025). Economic policy uncertainty and underinvestment in Indian firms, <https://tinyurl.com/48ksa7np>.

capital formation, i.e., reduce 0.51 per cent of their net fixed assets over five years - although the impact varies significantly across firm characteristics. Categorisation of the firms by size, export orientation and sector reveals the following: -

- (i) **By size**<sup>19</sup>: Large firms (top decile) reduced 0.5 per cent of their NFA on average, while mid-sized firms showed the steepest decline at 4.7 per cent. As opposed to mid-sized firms, small firms proved to be more resilient, reducing their net fixed assets by only 1 per cent.
- (ii) **By export orientation**: Export-intensive firms reduced 1 per cent of their net fixed assets, while non-exporters largely halted capital expenditure.
- (iii) **By sector**: Transport equipment manufacturers showed robust capex relative to their NFA following an uncertainty shock. Manufacturers of light-tech products, such as leather (0.79 per cent of NFA), beverages (0.62), wood products (0.42), and rubber and plastics (0.17), registered moderate capital expenditure improvements amidst uncertainty. In contrast, technology-intensive firms, such as machinery (-0.49) and electrical equipment (-0.46), registered a moderate decline in capital expenditures following an uncertainty shock. Even so, other tech-intensive sectors such as chemicals (0.06) and pharmaceutical manufacturers (0.21) displayed consistent investment despite an uncertainty shock.

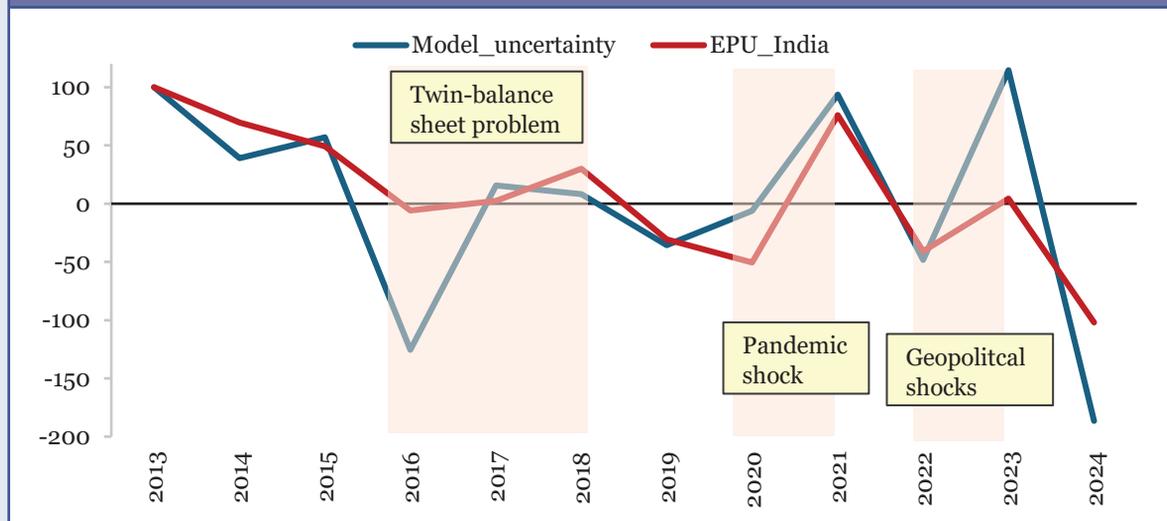
Services sector firms within categories such as civil engineering (8.51), consultancy (0.33), advertising (0.28), and retail trade (0.26) showed healthy capital expenditure following a shock.

As a robustness check, the uncertainty shocks reported by the model are compared to the EPU index for India between 2010 and 2024. The chart below illustrates the changes in uncertainty shocks and the corresponding changes in the EPU over time.<sup>20</sup> The two measures show a good degree of correlation (78 per cent). Both measures spike during the years of the twin balance sheet problem (2016-2018), the pandemic years (2020-2021) and in the presence of heightened geopolitical shocks (2022-2023). This shows that the model correctly gauges uncertainty before estimating its impact on capital formation across firms.

<sup>19</sup> Firms are separated based on size, depending on their relative ranking (amongst other listed firms) in terms of assets and sales over the past three years.

<sup>20</sup> While the EPU measures policy-related uncertainty, the model's estimates reveal the uncertainty experienced by firms. It may be noted that while policy uncertainty may be a sufficient condition for firms to experience uncertainty, it is not a necessary condition, i.e., firms may experience uncertainty shocks in the absence of policy uncertainty. For instance, a sectoral demand shock may trigger an uncertainty response for firms even in the presence of a stable policy environment.

**Chart III.2: Variations in EPU and model estimates of uncertainty (indexed to 100 for 2013)**



Source: Author's calculations.

### Inferences

In the absence of causality testing that accounts for other firm attributes, no inference can be made regarding the relationship between asset size and firm uncertainty. Nevertheless, the correlation between firm size and capital formation indicates that mid-sized firms in the sample were more vulnerable to uncertainty shocks than firms in the top or bottom deciles of the asset distribution. This may be because large firms can absorb shocks using internal resources, while small firms can leverage their agility to continue investing despite uncertainty. Mid-sized firms, in contrast, lack both the flexibility of small firms and the resource buffer of large ones.

As most of the shocks observed between 2010 and 2024 were of a global nature, the model indicated that exporter firms are more likely to reduce capital formation in the presence of an uncertainty shock compared to their domestic counterparts.

The impact of uncertainty is heterogeneous at a sectoral level. Traditional and medium-technology sectors displayed continued capital formation despite an uncertainty shock. The services sector, too, broadly held up to an uncertainty shock, as evidenced by sectors such as civil engineering, consultancy, and market research. In contrast, high-tech manufacturing firms, barring a few exceptions, cut back on capital formation. This is evidenced by the literature, which shows that manufacturing firms tend to experience intense uncertainty due to factors such as long gestation periods, higher irreversibility, and input supply disruptions.<sup>21</sup>

<sup>21</sup> See, for instance, Mohades Forooshani, S. S., Piccillo, G., & Treibich, T. (2024). Unpacking Economic Uncertainty: Measuring the Firm, Sector and Aggregate Components. CESIFO WORKING PAPERS, 10974, <https://tinyurl.com/z9kjfpwd>; Bar-Ilan, A., & Strange, W. C. (1996). Investment lags. *The American Economic Review*, 86(3), 610-622, <https://tinyurl.com/4tj4j8nn>; and Castelnovo, E., Tuzcuoglu, K., & Uzeda, L. (2022). Sectoral uncertainty, <http://dx.doi.org/10.2139/ssrn.4259631>.

Policy approaches aimed at reviving private capital formation must therefore explicitly account for uncertainty and its uneven sectoral effects, specifically for sectors that intensely experience uncertainty shocks. Reviving private capital expenditure in such areas requires buffering sector-specific uncertainty by enhancing predictability through deregulation and simpler, more stable laws and frameworks.

## MONETARY DEVELOPMENTS

3.9 India's approach to monetary management balances macroeconomic objectives with social goals. By maintaining price stability, supporting financial stability, and promoting inclusive growth, monetary policy acts as a key enabler of sustainable development and economic prosperity in the country.

3.10 In the light of the evolving macroeconomic and financial developments outlined in the previous section, the RBI undertook several key monetary policy actions in FY26 (April-December). These measures were designed to support economic growth while maintaining price stability. In response to the easing inflation, the RBI's Monetary Policy Committee (MPC) cumulatively reduced the repo rate by 100 basis points during its meetings from April to December 2025. As of December 2025, the repo rate stands at 5.25 per cent. These reductions were aimed at boosting credit flow, investment, and overall economic activity. Furthermore, in consideration of the prevailing and expected inflation-growth dynamics, the MPC's stance was changed from accommodative to neutral in June 2025. This neutral stance has been consistently maintained since then, allowing the MPC the flexibility to respond to economic conditions as necessary.

3.11 The RBI also announced a 100-bps reduction in the cash reserve ratio (CRR) to 3.0 per cent of net demand and time liabilities, implemented in a staggered manner during September-November 2025. This decision is expected to release approximately ₹2.5 lakh crore in primary liquidity into the banking system by December 2025.<sup>22</sup>

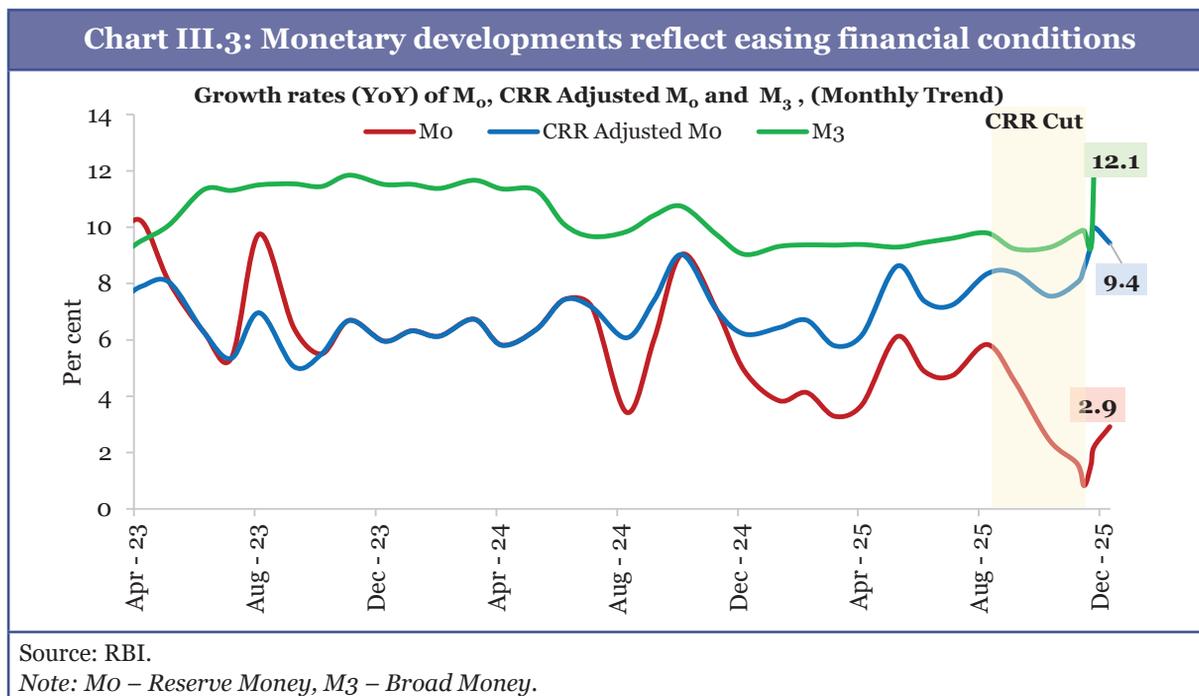
3.12 The trends in the monetary aggregates reflect the impact of the RBI's policy actions on the economy. As of 31 December 2025, the reserve money (Mo) growth,<sup>23</sup> i.e., the monetary base, stood at 2.9 per cent, compared to 4.9 per cent as of 27 December 2024. This declining trend does not signal a tightening of the liquidity conditions, since adjusted for the first-round impact of the change in the CRR,<sup>24</sup> the Mo growth stood at 9.4 per cent, compared to 6.2 per cent a year ago. Therefore, the declining trend reflects

<sup>22</sup> RBI's press release dated 6 June 2025, 'Governor's Statement', <https://tinyurl.com/ymx7rsdy>.

<sup>23</sup> On the component side, Reserve Money (Mo) = Currency in circulation + Banker's deposits with RBI + Other deposits with RBI.

<sup>24</sup> CRR was cumulatively reduced by 125 bps during December 2024-November 2025.

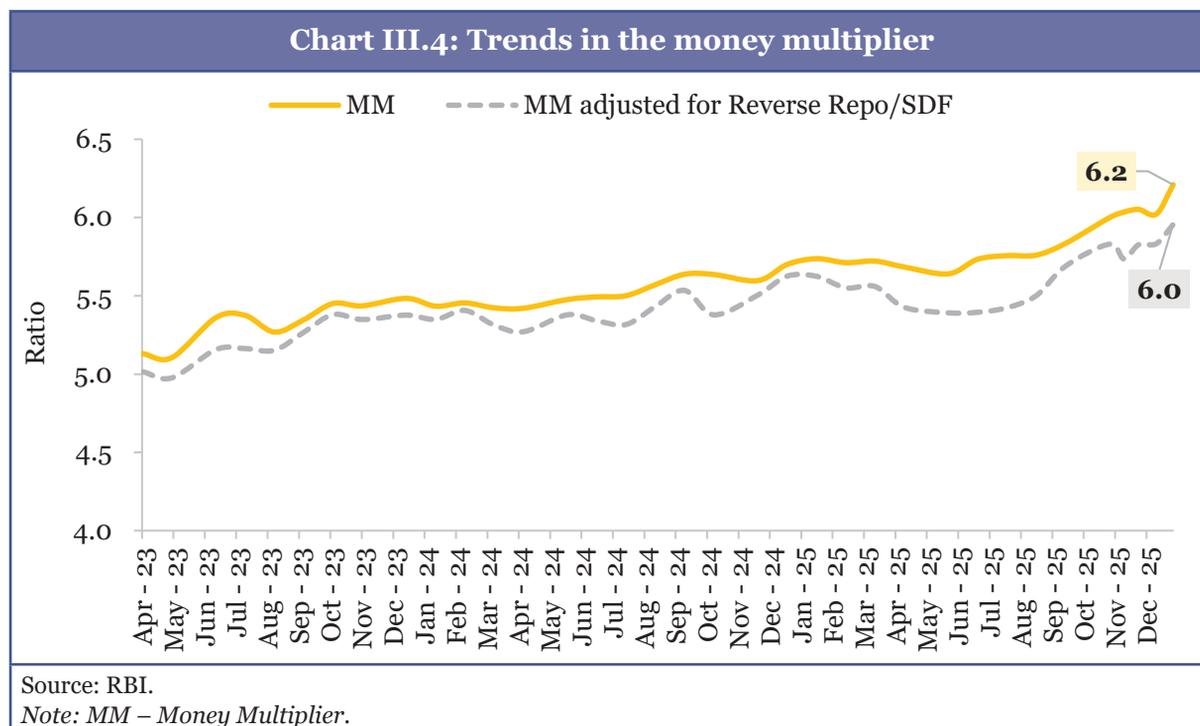
the impact of the CRR cut, which led to a reduction in bankers' deposits with the RBI, resulting in a decline in the growth of reserve money. The CRR-adjusted Mo reflects the true expansionary stance of monetary policy. On the component side, the currency in circulation expanded by 10.2 per cent as of 31 December 2025 compared to 5.9 per cent on 27 December 2024.



3.13 During the same period, broad money (M<sub>3</sub>) growth, including the impact of the merger of a non-bank with a bank (with effect from 1 July 2023), was 12.1 per cent, as compared with 9 per cent a year ago. This trend in the broad money growth indicates that the banks have effectively leveraged the liquidity released by the CRR cut. In terms of components, aggregate deposits with banks, which are the largest component of M<sub>3</sub>, were the primary drivers of M<sub>3</sub>'s growth. Notably, the aggregate deposits with the banks grew by 12.3 per cent (YoY). On the sources side,<sup>25</sup> bank credit to the commercial sector was a major contributor to the increase in M<sub>3</sub>, growing by 14.1 per cent (YoY).

3.14 As of 31 December 2025, the money multiplier (MM), i.e., the ratio of M<sub>3</sub> to M<sub>0</sub>, stood at 6.21 vis-à-vis 5.70 a year ago. When adjusted for the reverse repo/standing deposit facility (SDF), which is analytically akin to bankers' deposits with the central bank, the adjusted MM stood at 6.0. The upward trajectory of the MM indicates improved financial intermediation by the banking system, thereby ensuring adequate systemic liquidity.

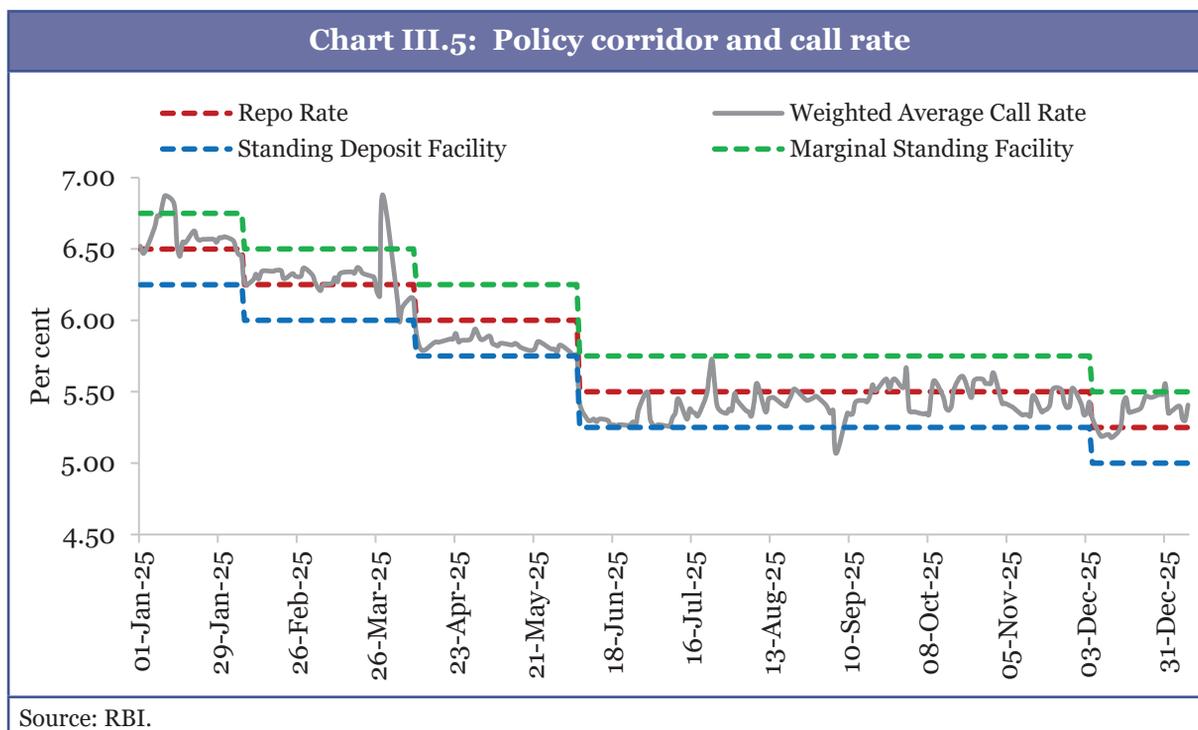
<sup>25</sup> Sources of Broad Money = Net Bank Credit to Government + Bank Credit to Commercial Sector + Net Foreign Exchange Assets of Banking Sector + Government's Currency Liabilities to the Public - Net Non-Monetary Liabilities of the Banking Sector.



## Liquidity Conditions

3.15 Along with the 100-bps cut, the RBI also injected durable liquidity of ₹2.39 lakh crore through nine Open Market Operations (OMO) purchases during April-May 2025. Furthermore, in light of the evolving liquidity conditions and outlook, the RBI conducted OMO purchases of ₹1 lakh crore and a 3-year USD/INR buy-sell swap of USD 5 billion in December to inject durable liquidity into the system. As a result, system liquidity, as measured by the net position under the liquidity adjustment facility (net LAF), was on average in surplus of about ₹1.89 lakh crore during FY26 (up to 8 January 2026), significantly higher than ₹1,605 crore in FY25. Reflecting surplus liquidity conditions, banks' recourse to the marginal standing facility (MSF) declined while their deployment of surplus funds under the SDF increased. Borrowings under the MSF declined to an average of ₹2,244 crore in FY26 (as of 8 January 2026) from ₹6,902 crore in FY25. Concomitantly, the deployment of funds under the SDF increased to an average of ₹1.74 lakh crore in FY26 (up to 8 January 2026) as compared with ₹0.94 lakh crore in FY25.

3.16 Throughout FY26, the RBI remained agile in its liquidity management, ensuring that adequate liquidity was maintained in the banking system. This proactive approach facilitated effective transmission to the money and credit markets, meeting the economy's productive requirements. As a result, the weighted average call rate, which serves as the operating target of monetary policy, generally remained below the policy repo rate during FY26, averaging 8 basis points below it (up to 8 January 2025).



3.17 Monetary policy transmission to lending and deposit rates of scheduled commercial banks (SCBs) has been robust amid surplus liquidity conditions. In response to the 100-bps cumulative cut in the policy repo rate, the weighted average lending rates (WALR) of the SCBs declined. During April–November 2025, the WALR of SCBs on fresh rupee loans decreased by 64 basis points, standing at 8.71 per cent in November 2025. Similarly, the WALR of SCBs on outstanding rupee loans has decreased by 56 basis points over the same period, standing at 9.21 per cent in November 2025, reaching its lowest level recorded since September 2022.

## FINANCIAL INTERMEDIATION

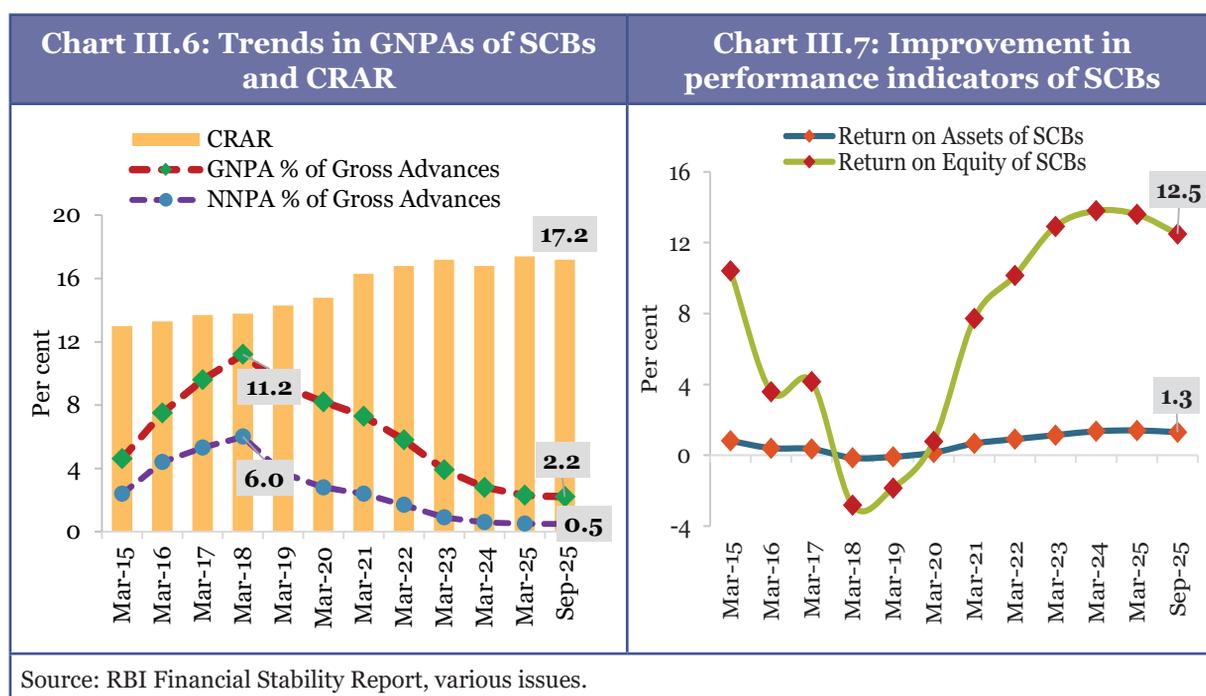
3.18 Financial intermediaries implement monetary policy by transmitting the central bank’s decisions on interest rates, liquidity management, and credit supply to the real economy. Central banks set policy rates and conduct market operations, while financial intermediaries adjust lending and deposit rates, influencing spending, investment, inflation, and financial stability.

3.19 Financial intermediation in the Indian economy is carried out by a diverse set of institutions, including banks, non-banking financial companies (NBFCs), microfinance institutions (MFIs), capital markets, and digital fintech platforms. These entities mobilise savings, channel credit, manage risks, and enable efficient transactions, thereby bridging the gap between savers and borrowers. The country’s financial intermediation landscape has undergone rapid digital transformation, with innovations such as the

Unified Payments Interface (UPI), Aadhaar-enabled services, and AI-driven credit scoring expanding access to financial services, particularly in rural and underserved areas. This section discusses the trends in the functioning of various intermediaries and regulatory developments.

## Performance of the banking sector

3.20 The stability of the banking system in the country can be attributed to strong capital buffers, low non-performing asset ratios (NPAs), and increasing profitability. The favourable balance sheets of the SCBs bode well for the overall health of the economy. A significant improvement has been observed in the asset quality of SCBs, as evidenced by their gross non-performing asset (GNPA) ratio and net NPA ratio, having reached a multi-decadal low level and record low level, respectively. At the same time, the capital-to-risk-weighted-asset ratio (CRAR) of the SCBs remained strong at 17.2 per cent as of September 2025.

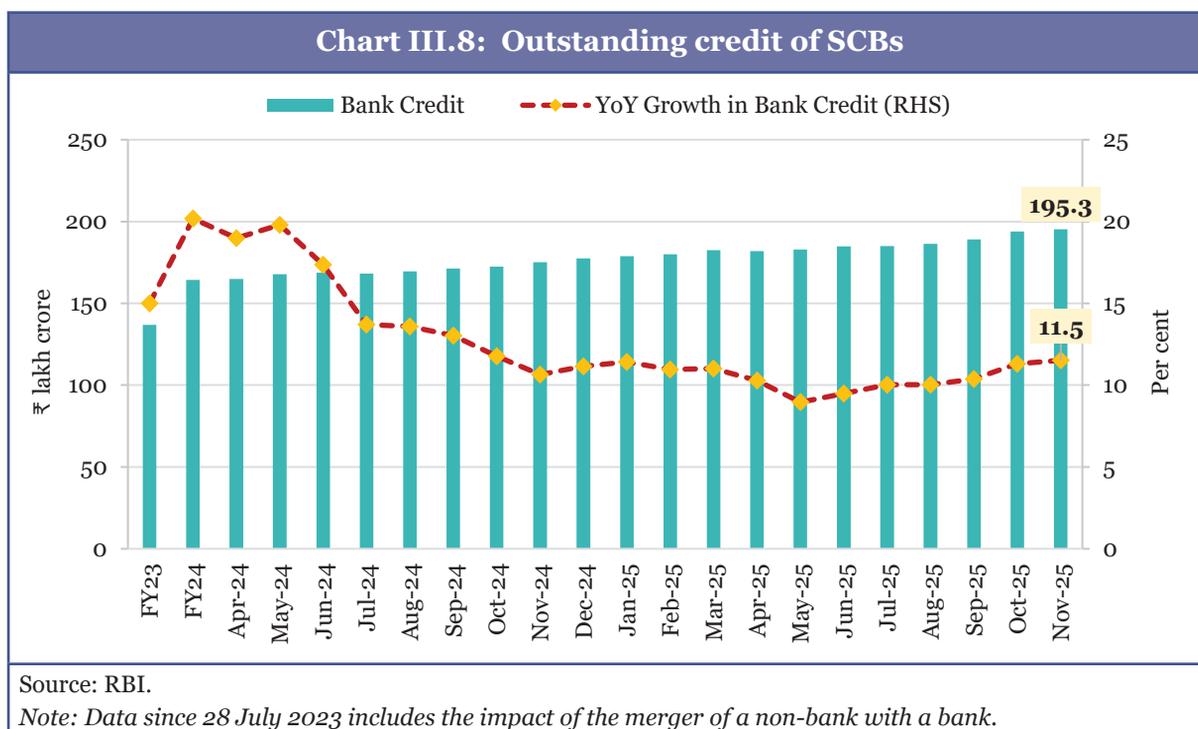


3.21 Furthermore, this improvement in asset quality has been observed across broad economic sectors. The GNPA ratio for the industry decreased from 2.3 per cent in March 2025 to 1.9 per cent in September 2025. For services, the ratio decreased from 2.0 per cent to 1.8 per cent, and for personal loans, it decreased from 1.2 per cent to 1.1 per cent. In contrast, the GNPA ratio for the agriculture sector remains relatively higher at 6.0 per cent in September 2025 and has improved marginally from 6.1 per cent in March 2025. However, the share of this sector in total GNPA has increased from 34.6 per cent to 36.3 per cent over the same period.

3.22 The recovery rate in NPAs<sup>26</sup> in SCBs has approximately doubled from 13.2 per cent in FY18 to 26.2 per cent in FY25. The slippage ratio of SCBs, which measures the amount of new accretion to NPAs during the FY as a percentage of standard loans and advances as at the beginning of FY, has also improved from 7.1 per cent in FY18 to 1.4 per cent in FY25 and further to 1.3 per cent in FY26, as of September 2025. The recovery rate through the Insolvency and Bankruptcy Code, 2016 (IBC/Code) has improved from 28.3 per cent in FY24 to 36.6 per cent in FY25. Through the SARFESI, it has improved from 25.4 per cent in FY24 to 31.5 per cent in FY25.

3.23 Concurrently, the profitability metrics of SCBs are as follows. Their profit after tax increased by 16.9 per cent (YoY) in FY25 and by 3.8 per cent (YoY) by September 2025. The return on equity for SCBs has experienced a marginal decline from 13.8 per cent in March 2024 to 13.6 per cent in March 2025; however, it has maintained a steady upward trend since March 2020. On the other hand, the return on assets has remained stable at 1.4 per cent in March 2025, consistent with the level recorded in March 2024. As of September 2025, these metrics stand at 12.5 per cent and 1.3 per cent, respectively.

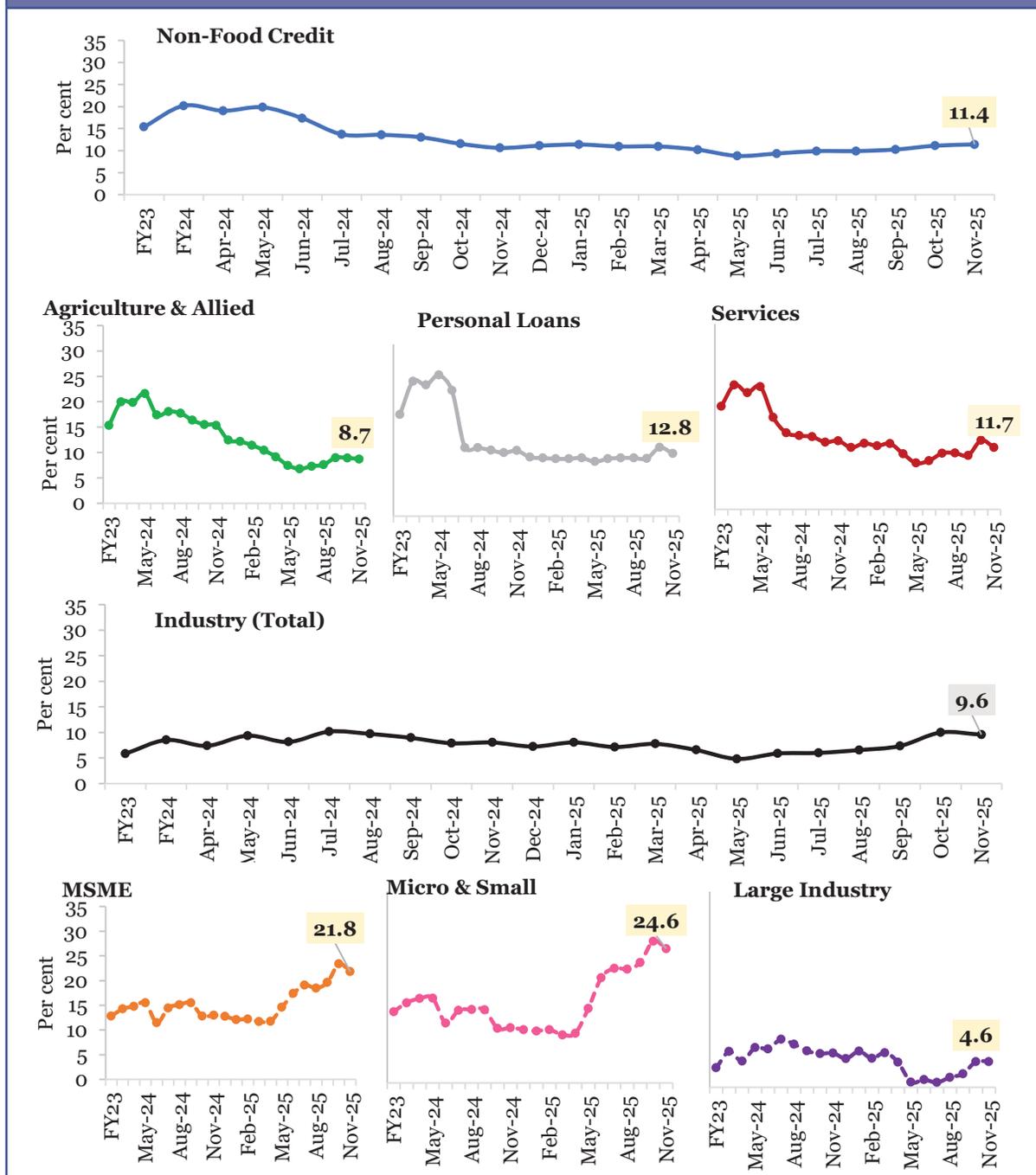
3.24 In FY26, a moderation in bank credit growth was observed across major sectors compared to the same period last year, though recent months have shown an uptick. As of 31 December 2025, the (YoY) growth in outstanding credit by SCBs increased to 14.5 per cent compared to 11.2 per cent in December 2024. December 2025 marked the highest YoY growth rates for both bank credit and non-food credit in FY26 (up to December 2025).



<sup>26</sup> Recovery rate in NPAs in SCBs is calculated as the aggregate recovery made by public sector banks in NPAs, including written-off loans as a percentage of gross NPAs at the beginning of FY.

3.25 In terms of sectoral deployment of non-food credit, among the categories of agriculture and allied activities, industry, services and personal loans, the highest YoY growth has been observed in personal loans, with an increase of 12.8 per cent in November 2025. A significant factor contributing to this growth is a substantial rise in loans against gold jewellery, which have increased by 125.3 per cent (YoY), likely due to the increasing prices of gold.

**Chart III.9: Sectoral deployment of non-food credit of SCBs (YoY growth)**



Source: RBI.

Note: Data since 28 July 2023 includes the impact of the merger of a non-bank with a bank.

3.26 While the YoY growth trend in credit for industry and services has demonstrated a moderate increase in FY26 thus far, within industry, the bank credit to the MSME sector continues to show momentum and remains robust. In November 2025, bank credit to this sector increased by 21.8 per cent compared to a 13 per cent increase in November 2024. Within the MSME sector, the credit extended to the micro and small enterprises has registered an increase of 24.6 per cent (YoY) in November 2025, up from 10.2 per cent in November 2024.

3.27 Certain regulatory measures, such as revised guidelines on voluntary pledge of gold and silver jewellery as collateral for small business loans, have helped in improving credit flow to the MSME segment. Furthermore, measures announced in the Union Budget 2025-26, such as a significant enhancement of credit availability with guarantee cover for MSMEs, the introduction of credit cards for micro-enterprises, and others, have also been beneficial to the sector. The revision in MSMEs classification, wherein investment limits and turnover thresholds have been substantially raised, also contributed to this high growth.<sup>27,28</sup>

3.28 Between FY20 and FY25, there has been a notable increase in the overall flow of resources to the commercial sector, demonstrating a compounded annual growth rate (CAGR) of 20.9 per cent. This flow has increased from ₹13.6 lakh crore in FY20 to ₹35.1 lakh crore in FY25.<sup>29</sup> This upward trend has continued into FY26, with the overall flow of resources to the commercial sector amounting to ₹30.8 lakh crore in April-December 2025, registering an increase of 44.7 per cent (YoY).

3.29 As of 31 December 2025, within the overall flow of financial resources to the commercial sector, there has been an increase in the flow from non-bank sources, which have risen by 23.8 per cent (YoY), while the non-food bank credit has experienced a growth of 58.6 per cent (YoY).

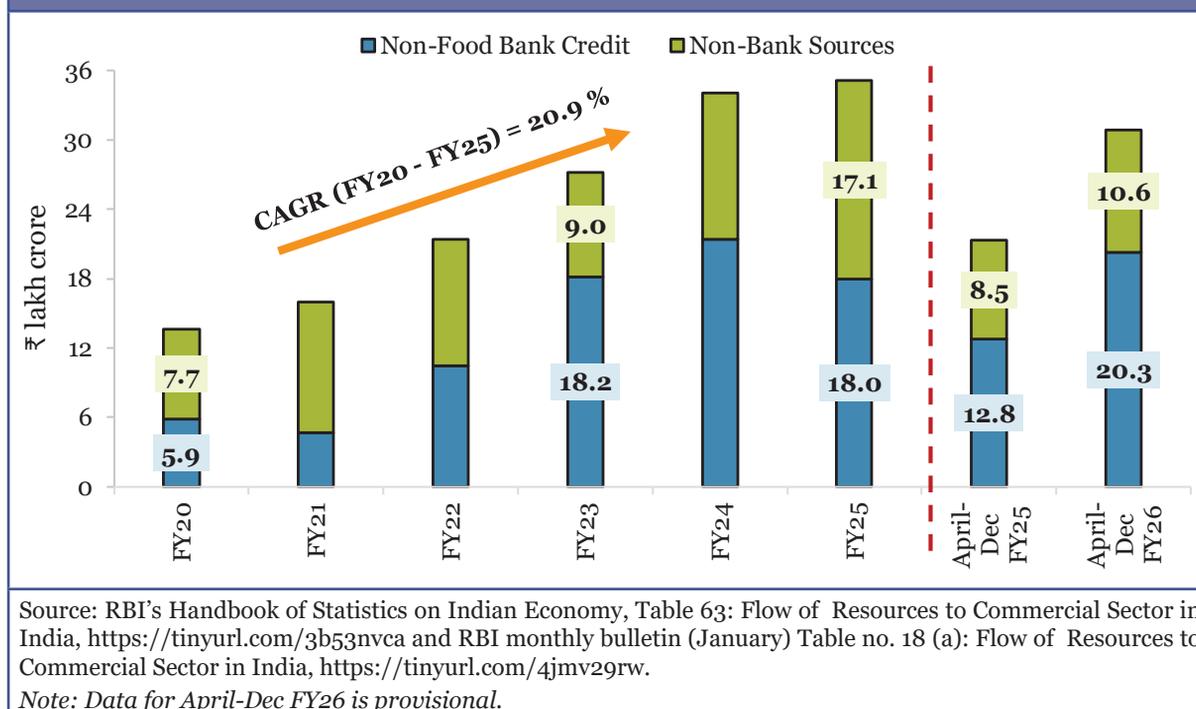
---

<sup>27</sup> Union Budget 2025-26, <https://tinyurl.com/2s4ed4c9>.

<sup>28</sup> RBI Monetary Policy Report, October 2025, <https://tinyurl.com/2rj4mwzm>.

<sup>29</sup> RBI's Handbook of Statistics on Indian Economy, Table 63: Flow of Resources to Commercial Sector in India, <https://tinyurl.com/3b53nvca> and RBI monthly bulletin (January) Table no. 18 (a): Flow of Resources to Commercial Sector in India, <https://tinyurl.com/4jmv29rw>.

Chart III.10: Overall flow of resources to the commercial sector in India



3.30 Further within the non-bank sources, foreign sources have experienced a greater YoY increase as compared to the domestic sources. In FY26, as of 31 December 2025, while the former have experienced a growth of 38 per cent, the latter have experienced a growth of 19.1 per cent (YoY). The increase in foreign sources is driven primarily by a significant rise in external commercial borrowings by non-financial entities, which increased from ₹5 thousand crore to ₹27.7 thousand crore, and foreign direct investment (FDI) to India, which increased by 67 per cent (YoY). The increase in domestic sources is mainly attributable to a rise in the corporate bond issuances by non-financial entities, which have experienced a 263.3 per cent (YoY) growth. The foregoing discussion highlights the banking sector's robust performance and resilience.

3.31 It is important to note that a concurrent increase in the flow of financial resources to the commercial sector, bolstered by greater non-bank intermediation, has accompanied the slowdown in bank credit growth in early FY26. This trend indicates that non-bank sources have effectively offset the decline in bank credit. The quicker transmission of monetary policy has made market-based financial instruments a feasible source of funding for large corporations. Furthermore, as the profitability of large corporations has risen over time, their internal resources have become a vital source for business expansion.<sup>30</sup> Collectively, these factors have led to a reduction in their demand for bank credit. Therefore, large corporations are increasingly turning to market-based

<sup>30</sup> RBI's Monthly Bulletin (August), 2025, <https://tinyurl.com/2x2yydj4>.

instruments to meet their funding requirements, while MSMEs primarily depend on bank credit to fulfil their funding needs.

3.32 In rural and semi-urban areas, the financial intermediation is primarily conducted through Regional Rural Banks (RRBs). These banks provide an alternative channel for credit distribution to small and marginal farmers, agricultural labourers, and socioeconomically disadvantaged groups. Their main focus areas include agriculture, trade, commerce, and small-scale industries in rural regions. The following section reviews recent measures implemented to strengthen and streamline the RRB structure, as well as their evolving financial performance.

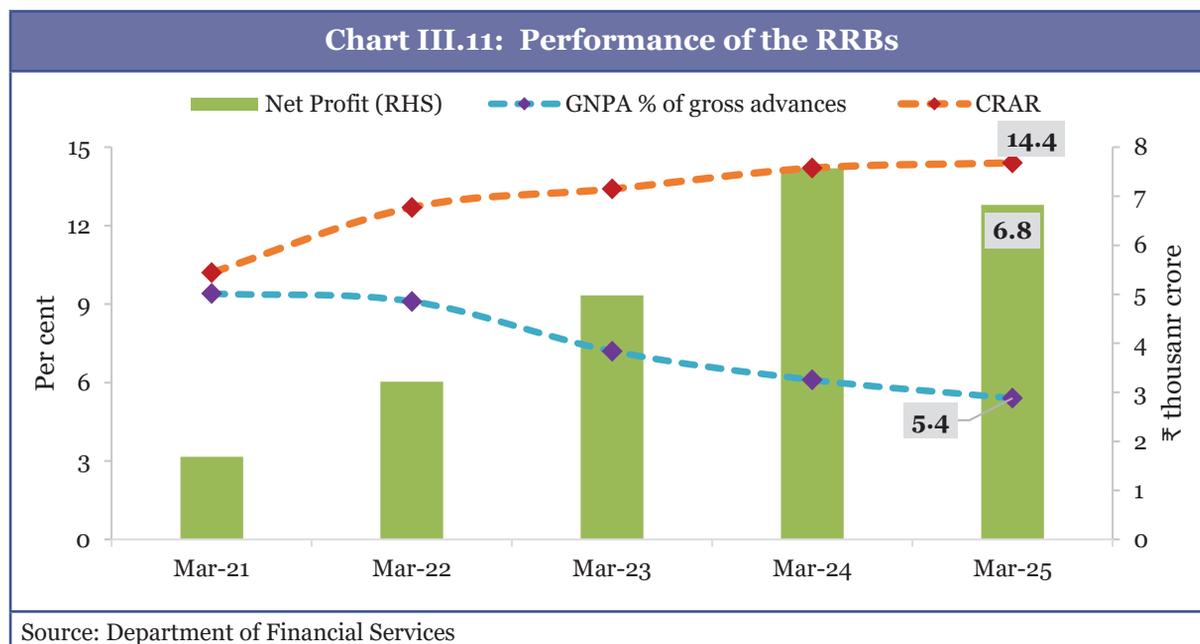
### **Performance of regional rural banks**

3.33 The government undertook various measures to optimise the resources and enhance the performance of the RRBs, such as their consolidation in four phases based on the principle of One-State-One-RRB that reduced their number from 196 to 28 as of 1 May 2025. Furthermore, the integration of the Core Banking Solution and other IT systems of the amalgamated RRBs into unified platforms has been undertaken. To establish a unified brand and national identity of RRBs, a common logo has been adopted for all 28 RRBs.

3.34 Due to the above measures, their performance has improved significantly. In recent years, the financial health of the RRBs has improved. During FY24, they achieved a record consolidated net profit of ₹7.6 thousand crore, followed by a second-highest consolidated net profit of ₹6.8 thousand crore during FY25. This slight decline in profit can be attributed to the implementation of the pension scheme with retrospective effect from 1 November 1993, as well as the payments towards computer increment liability.<sup>31</sup> Moreover, key financial indicators have shown consistent improvement. While the GNPA ratio for SCB in the agricultural sector remains relatively high, the asset quality of RRBs has shown notable improvement. The GNPA ratio, expressed as a percentage of gross advances, decreased from 6.1 per cent in FY24 to 5.4 per cent in FY25, reflecting the lowest level in the past 13 years.

---

<sup>31</sup> Lok Sabha Unstarred Question no. 111 answered on 1 December 2025, <https://tinyurl.com/52n6ymcf>.



3.35 Additionally, credit expansion has contributed to an increase in the consolidated credit-to-deposit ratio, which rose from 71.4 per cent in March 2024 to 73.8 per cent as of March 2025, the highest level recorded in 35 years. Furthermore, the consolidated CRAR of all RRBs reached an all-time high of 14.4 per cent at the end of FY25. It is also noteworthy that RRBs have consistently exceeded the priority sector lending target of 75 per cent of their adjusted net bank credit over the years, underscoring their commitment to fulfilling their foundational objectives.

### Major policy actions in the banking sector

3.36 A rise in global uncertainty and geopolitical volatility demands a stable and efficient domestic regulatory regime. The RBI has been committed to ensuring regulatory certainty and efficiency over time. In this context, its recent measures aimed at enhancing these aspects within the banking sector are timely and significant.

3.37 The RBI issued a policy statement on ‘Framework for Formulation of Regulations’ on 7 May 2025 with an objective to standardise the process of making regulations in a transparent and consultative manner after conducting impact analysis, as may be feasible. It also stipulates a periodic review of regulations, taking into account the stated objectives, experience gained through surveillance and supervision, relevant court orders, global best practices or standards prescribed by international standard-setting bodies, the relevance in a changing environment, and the scope for reducing redundancies.

3.38 The public sector banks (PSBs) have launched the credit assessment model (CAM)

based on the digital footprints<sup>32</sup> for MSMEs in 2025. This model will leverage digitally fetched and verifiable data to enable automated loan appraisal for MSMEs, utilising objective decisioning for all loan applications and model-based limit assessment for both existing-to-bank and new-to-bank MSME borrowers. Along with improving the ease of doing business for the MSMEs, this model also integrates the credit guarantee schemes, such as the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE). Between 1 April and 30 November 2025, over ₹3.2 lakh crore MSME loan applications, amounting to more than ₹41.5 thousand crore, have been sanctioned by PSBs under the credit programmes of CAM.

3.39 RBI has also initiated a significant reorganisation of its regulatory instructions, a move that signifies a transformative change in its regulatory communication. This comprehensive effort involved consolidating over 9,000 existing circulars and guidelines into 238 function-specific Master Directions, tailored for distinct categories of regulated entities. Additionally, instructions issued by NABARD to RRBs, State Cooperative Banks, and Central Cooperative Banks were also consolidated in consultation with NABARD. As part of this initiative, the central bank will repeal 9,446 circulars, of which 3,809 have been incorporated into Master Circulars, while the remaining 5,673 have been deemed obsolete. This exercise aims to enhance clarity and accessibility while reducing the compliance burden on regulated entities, ultimately supporting the overarching objective of improving the ease of doing business.<sup>33</sup>

3.40 To strengthen the institutional mechanism for review of regulations, the RBI has constituted a regulatory review cell with a mandate to review every regulation in a comprehensive, objective, and systematic manner, at least once every 5-7 years. The cell has been operationalised effective from 1 October 2025. Furthermore, to strengthen stakeholder engagement in the regulatory process and leverage industry expertise continuously, an independent Advisory Group on Regulation comprising external experts has been established.

3.41 Within the strengthened regulatory governance architecture, the RBI has also articulated principle-based guidance for the use of AI. It has introduced a Free AI framework for responsible AI, which is designed to foster financial innovation while ensuring robust risk management. In this context, Box III.2 discusses the details of the framework as well as cross-country usage of AI by central banks.

---

<sup>32</sup> Digital footprints are used by the model for know your customer (KYC) authentications, mobile and email verifications. GST data analysis, bank statement analysis (using account aggregator), ITR verification and due diligence using credit information companies' data, fraud checks, among others.

<sup>33</sup> RBI Press release dated 28 November 2025: Reserve Bank of India issues Consolidated Master Directions, <https://tinyurl.com/5n6wpw5h>.

### Box III.2: Artificial Intelligence in financial services: Global trends and India's approach.

Globally, the adoption of AI in finance is accompanied by parallel developments in international policy. The World Economic Forum's white paper on AI in Financial Services (January 2025) projects that investments across banking, insurance, capital markets and payments business will reach USD 97 billion by 2027, with AI making substantial contributions to revenue growth in the forthcoming years through enhanced operational efficiency, accuracy and a higher degree of personalisation at scale.<sup>34</sup> Further, the AI-powered alternative credit scoring models promote financial inclusion, particularly in developing economies.

There is a convergence in priorities among central banks as they adopt AI, which includes using AI to enhance decision-making, improve operational efficiency, and manage risks effectively. However, there is a notable difference in their adoption of specific AI initiatives. The use of AI by a few central banks is discussed below:

The European Central Bank utilises AI to enhance statistics for monetary policy, supplement data with sources such as text and images using large language models, and for nowcasting and forecasting inflation. It also developed early warning models to identify financial risks. It created innovative payment services, such as voice-activated payments, to promote financial inclusion and enhance communication, thereby ensuring a better understanding of policies and inflation expectations.<sup>35</sup> The Federal Reserve's Federal Open Market Committee has adopted AI for tasks such as writing, coding and research to enhance the analytical capabilities and gain insights into the broader implications of AI.

This approach has helped the Fed understand both the benefits of AI and identify its limits, as well as areas where its use requires caution.<sup>36</sup> The Bank of Canada has primarily adopted AI to forecast inflation, economic activity, and the demand for banknotes. It also tracks the sentiments in key sectors of the economy using sentiment analysis.<sup>37</sup> The Bank of England has forecasted service inflation using a machine learning model, as well as to predict financial crises and bank distress.<sup>38,39</sup>

These AI applications pose risks of unintended outcomes and ethical issues. Policymakers respond with various regulations, including principles, voluntary measures, and laws. The

<sup>34</sup> World Economic Forum: White Paper - Artificial Intelligence in Financial Services, January 2025, <https://tinyurl.com/39n2ttap>.

<sup>35</sup> Keynote speech by Piero Cipollone, Member of the Executive Board of the European Central Bank, at the National Conference of Statistics on official statistics at the time of artificial intelligence, dated 4 July 2024: <https://tinyurl.com/ec23snp3>.

<sup>36</sup> Speech by Governor Lisa D. Cook at the National Bureau of Economic Research, Summer Institute 2025: Digital Economics and Artificial Intelligence, Cambridge, Massachusetts, dated July 17 2025: <https://tinyurl.com/ywrd4ana>.

<sup>37</sup> Remarks by Tiff Macklem, Governor of the Bank of Canada, at the National Bureau of Economic Research, Economics of Artificial Intelligence Conference, dated 20 September 2024: <https://tinyurl.com/46recz49>.

<sup>38</sup> Bank of England's Monetary Policy Report, May 2025: <https://tinyurl.com/4y6ke639>.

<sup>39</sup> Speech by James Benford TRUSTED AI: Ethical, safe, and effective application of artificial intelligence at the Bank of England: <https://tinyurl.com/mryjwas4>.

EU has developed a comprehensive AI framework through the EU AI Act, providing uniform rules and risk-based classification. Singapore adopted a multi-stakeholder approach for responsible AI in fintech, ensuring ethical compliance. The UK and US are relying on guidance frameworks, letting sector regulators adjust rules as needed.

Despite these diverse approaches, a shared objective emerges to ensure that AI enhances the provision of financial services in a safe and inclusive manner. These global developments provide important context and benchmarks for India's trajectory in governing AI in the finance sector.

### **India: RBI's FREE-AI Framework for Responsible AI<sup>40</sup>**

India's approach to adopting AI in financial services aligns with the broader goal of leveraging technology for inclusive economic development. The country's unique digital public infrastructure lays a foundation for AI integration, aiming to democratise financial access at an unprecedented scale.

Based on detailed surveys, the RBI found that AI adoption in Indian finance is still in its early stages, with only approximately 21 per cent of surveyed banks and financial institutions implementing or developing AI solutions. Adoption is concentrated among larger banks, while smaller urban cooperative banks and many NBFCs face resource constraints, including inadequate data infrastructure, limited skilled talent, and insufficient IT budgets. Additionally, even among early adopters, the use of AI applications remains basic, often focusing on improving process efficiency, customer interactions (such as simple chatbots), lead generation, and internal decision support, rather than engaging in complex autonomous decision-making.

The RBI's FREE-AI is designed to foster innovation while ensuring robust risk management, highlighting that these two elements are complementary forces that should be pursued together. The framework also supports the India AI Mission, enhancing national AI capabilities, and aligns with the Digital Personal Data Protection Act, ensuring consistency in data governance.

The RBI's framework recognises the importance of trust in mitigating systemic risks and preserving consumer confidence. It identifies seven core guiding principles, referred to as the 'Seven Sutras', to ensure effective AI development, deployment, and governance within the financial sector. These are (i) Trust; (ii) People First; (iii) Innovation over restraint; (iv) Fairness and equity; (v) Accountability; (vi) Understandable by design; (vii) Safety, resilience and sustainability.

Guided by these principles, the RBI's FREE AI outlines six strategic pillars for effectively implementing its vision. Under the Innovation Enablement Framework, the focus is on Infrastructure, Policy, and Capacity Building. This includes developing shared data and technology infrastructure to democratise AI access (for example, data lakes or plug-and-play 'landing zones' platforms that smaller firms can leverage), crafting agile policies and

<sup>40</sup> Source: RBI FREE-AI Committee Report: <https://tinyurl.com/y9sev5a6>.

establishing regulatory sandboxes for safe and controlled experimentation, along with addressing the AI skill gap. The Risk Mitigation Framework focuses on Governance, Protection, and Assurance to create transparent governance structures (like board oversight and ethics committees), implement robust protective measures for privacy and security, and mandate ongoing monitoring and validation of AI systems to ensure reliability.

The pillars of the framework provide a structured approach for financial regulators and institutions to leverage the benefits of AI while managing associated risks. At the same time, this position puts India as a leader in AI governance and presents a model for emerging economies, effectively balancing innovation with social responsibility.

## Microfinance and financial inclusion

3.42 India's microfinance sector represents a key channel for advancing grassroots development in the country. With 95 per cent women borrowers and 80 per cent rural clientele, the sector addresses segments where credit access has historically been limited.

3.43 The sector operates through a diverse institutional structure. As of March 2025, NBFC-MFIs held 39 per cent market share by loan outstanding, followed by banks (32 per cent), small finance banks (16 per cent), NBFCs (12 per cent), and others (1 per cent). Microfinance operations span 685 districts across 28 states and 5 UTs, with the Eastern and Southern regions accounting for 62 per cent of the outstanding portfolio.<sup>41</sup>

3.44 Over the past decade, the microfinance sector has displayed steady growth, with active borrowers nearly doubling from 330 lakh in FY14 to 627 lakh in FY25. During this period, the gross loan portfolio of MFIs multiplied nearly seven times from ₹33,517 crore in FY14 to ₹2,38,198 crore in FY25. At the same time, MFI branch networks expanded from 11,687 branches to 37,380.<sup>42</sup>

3.45 The microfinance sector experienced a reversal in growth in FY25, with loan outstanding declining by 14 per cent on a YoY basis. The stress reportedly appears to have been driven by credit overexposure in the sector, following a rise in pent-up demand after the pandemic period.<sup>43</sup> In response, the RBI, through its circular (dated 6 June 2025),<sup>44</sup> has taken a proactive measure by reducing the minimum qualifying assets mandated for microfinance from 75 per cent to 60 per cent of total assets for NBFC-MFIs. This is expected to enable NBFC-MFIs to manage their portfolio risks more effectively.<sup>45</sup> Critically, stringent guardrails were established by self-regulatory

41 Bharat Microfinance Report 2024-25, <https://tinyurl.com/yy3bsze4>.

42 Various Sa-Dhan reports across years, <https://tinyurl.com/ytm6pk9t>.

43 Ibid note 41.

44 RBI's notification: Review of Qualifying Assets Criteria dated 6 June 2025, <https://tinyurl.com/d4tr86vw>.

45 MFIN's Press Release on RBI's circular on "Review of Qualifying Assets Criteria" dated 9 June 2025, <https://tinyurl.com/ybwcuufyn>.

organisations (SROs)<sup>46</sup> in the form of reduced loan limits and caps on overall borrower indebtedness. In response to the prompt regulatory action, stress in the MFI sector has begun to temper with a reduction in risky assets on a quarterly basis between Q1 FY26 and Q2 FY26. Other indicators, such as loan disbursements and solvency ratios, showed a steady improvement across the same period.<sup>47</sup>

3.46 Research suggests that MFIs face certain operational challenges, including the limited availability of a primary and standardised approach to assess household income. In the absence of alternative cash flow information, household income assessment may not always be fully accurate, and MFIs often rely on in-house estimation methods. However, this is likely to improve over time as more households come within the ambit of digital public infrastructure (DPI) and digital finance, which facilitates better generation and availability of cash flow information. MFIs are presently not seen to offer tailored credit with differential pricing for different categories. In some instances, lending may become more competitive when multiple MFIs serve the same borrowers, which may be symptomatic of deeper incentive structures within the MFI system. Box III.3 examines the incentive structures that may be contributing to the aggressive lending strategies employed by MFIs. They also often have little visibility over certain types of loans, such as gold loans, agricultural loans, and cooperative society credit. This can constrain their ability to calculate accurate repayment obligations of the borrower at the time of availing credit.<sup>48</sup>

3.47 While the microfinance sector has evolved significantly over the past decade, its continued growth would hinge on strengthening enabling infrastructure (such as the tools to assess creditworthiness), ensuring responsible lending practices, and continuously strengthening institutional resilience to manage cyclical volatility.

### **Box III.3: Microfinance, financialisation, and the need to re-centre household welfare in impact investing**

Microfinance has been a crucial component of India's financial inclusion strategy, particularly for low-income and rural households, as well as for women borrowers. The sector has expanded significantly over the past two decades, supported by institutional formalisation and the entry of private equity (PE) and venture capital (VC) investors. Commercial capital

<sup>46</sup> ASRO is an industry-led body that brings together market participants to enhance sector credibility, accountability, and governance. Self-regulation is intended to complement the existing regulatory and statutory framework, promoting compliance in both letter and spirit. To this end, SROs frame best practices, standards, and codes within the regulatory framework prescribed by the RBI for voluntary adoption by their members—these are not a substitute for the prescribed regulatory requirements for regulated entities. For more information, please refer - <https://tinyurl.com/3v3bdy7j>.

<sup>47</sup> Sa-Dhan. (2025). Quarterly Microfinance Report (July–September 2025), <https://tinyurl.com/ms6xn6u9>.

<sup>48</sup> Based on the findings by Dwara Research's report which derives from an extensive survey across the microfinance ecosystem, <https://tinyurl.com/bd8x6bz2>.

has enabled MFIs to scale operations, expand outreach, adopt technology, and integrate a large number of borrowers into the formal credit system. These gains to financial inclusion are substantial and merit recognition.

At the same time, the sector has experienced repeated episodes of stress, including over-lending, borrower over-indebtedness, and a rise in NPAs. These cycles indicate that rapid expansion of credit, when combined with strong financial-return expectations, can create vulnerabilities at both the institutional and household levels. They also raise a broader question about whether the growing financialisation of the sector has, in some contexts, weakened the original balance between social objectives and financial sustainability.

Microfinance was initially conceptualised as a model that aimed to improve household resilience, support income stability, and enable gradual asset accumulation. Over time, as MFIs became integrated into capital markets, their operating environment increasingly reflected the incentives associated with growth-oriented commercial investment. In such settings, portfolio expansion, yield metrics, and valuation outcomes may come to dominate strategic decisions, while social outcomes remain implicitly assumed rather than explicitly measured.

One outcome of this shift has been the use of scale-based ‘impact’ indicators, which are easier to report but are weakly connected to household welfare. These include metrics such as the number of borrowers reached, size of loan portfolios, share of women borrowers, or geographic spread. While useful for describing outreach, such indicators do not capture whether borrowers are better off in net terms. In practice, they can unintentionally reward more intensive lending, frequent top-ups, and deeper credit penetration, even in contexts where household repayment capacity is limited.

A more appropriate approach would require replacing such ‘impact-washing’ metrics with indicators that track household-level welfare and financial resilience over time. These could include measures of net asset accumulation, stability of cash flows, changes in savings balances, reduction in reliance on informal lenders, and incidence of distress borrowing during shocks. Tracking debt-to-income ratios, repayment burden perceptions, and volatility in household expenditure patterns would provide additional insight into whether microfinance is supporting long-term financial health rather than increasing net indebtedness.

Where such welfare-linked indicators are used, it becomes easier to identify circumstances in which credit expansion may be weakening household balance sheets. Existing empirical studies in India already document pockets of over-indebtedness in regions with high lender concentration and multiple borrowing.<sup>49</sup> Thus, excessive credit intensity, when not matched by robust credit appraisal and borrower capacity, can increase vulnerability and lead to repayment stress.

<sup>49</sup> LEAD at Krea University. (2020, January 6). Study on the drivers of over-indebtedness of microfinance borrowers in India: An in-depth investigation of saturated areas. IFMR-LEAD. <https://tinyurl.com/3sm4hh29>.

The alignment of investment incentives is closely related to this measurement challenge. Commercial capital has provided significant benefits in terms of institutional capacity, but PE/VC investment structures generally prioritise growth, profitability, and timely financial exits. As a result, investment performance is largely assessed through financial indicators, including portfolio growth, earnings milestones, and valuation appreciation. Social impact is stated as an objective, but its achievement is not always tied to investment outcomes in a systematic or verifiable manner.

A more consistent alignment between impact objectives and investor incentives would require linking exit decisions and valuations, at least partly, to the achievement of pre-specified social purpose metrics rather than exclusively to financial performance. For instance, investor exits could be conditioned on evidence of sustained household-level welfare gains, improved resilience indicators, or responsible credit intensity in borrower portfolios. Independent validation of such outcomes over a defined period would strengthen credibility and discourage growth strategies that prioritise scale at the cost of borrower sustainability.

This approach would also mitigate the risk that pressures to achieve time-bound exits lead to accelerated loan growth, expansion into riskier borrower segments, or a dilution of underwriting standards. Where exit readiness depends not only on financial metrics but also on demonstrable social outcomes, MFIs and investors would have stronger incentives to moderate expansion during periods of buoyant credit demand, focusing instead on portfolio quality, borrower capacity assessment, and complementary savings or insurance products.

From a policy standpoint, this realignment also has implications for the broader trajectory of financial inclusion. The experience of recent years suggests that inclusion defined primarily as access to credit may be fragile if not accompanied by improvements in household financial buffers. In some instances, easy access to frequent and repeated borrowing may displace precautionary savings and increase dependence on debt for smoothing routine expenditures. When repayment shocks occur, households may exit the formal credit system altogether, weakening the longer-term objective of inclusion.

Strengthening the resilience orientation of the sector would therefore require greater emphasis on household balance-sheet outcomes. This could include encouraging MFIs to integrate savings and risk-mitigation instruments alongside credit, improving borrower suitability assessments, and adopting data-driven mechanisms to detect emerging over-indebtedness. Impact measurement frameworks could also gradually transition from outreach-focused indicators to welfare-linked, household-level metrics, reported regularly and subject to independent review.

In summary, commercial capital has played an important role in expanding the reach and institutional capacity of India's microfinance sector. However, the incentives embedded in PE/VC investment structures have, in some contexts, encouraged financialisation and growth-driven expansion that may not always align with long-term household welfare. Re-centring the sector on its original social objectives will require replacing scale-based impact metrics with household-level welfare indicators and aligning investor exits and

performance evaluation with verified social outcomes alongside financial returns. Such an approach would strengthen the stability of financial inclusion gains and support the development of a more resilient and welfare-oriented microfinance ecosystem.

## Financial inclusion – trends and structural drivers

3.48 India has made significant strides in financial inclusion over the past decade. For instance, the number of adults possessing a bank account doubled between CY 2011 (35 per cent) and CY 2021 (89 per cent).<sup>50</sup> There has also been a sharp narrowing in the gaps in financial access (between rich and poor, male and female) over the past decade. These structural shifts have been underpinned by two converging forces: regulatory innovation through India's digital infrastructure and government-led microfinance initiatives. Together, these drivers have expanded both the scale and depth of financial inclusion nationwide. The following section examines each factor in detail.

3.49 To advance financial inclusion, the government has introduced several targeted interventions. The Pradhan Mantri Jan Dhan Yojana (PMJDY), launched in CY 2014, has opened 55.02 crore accounts as of March 2025, with 36.63 crore in rural and semi-urban areas, establishing foundational savings and transaction infrastructure for previously unbanked populations. Building on this account base, credit-focused schemes have extended formal lending to underserved segments. The Stand-Up India Scheme offers bank loans ranging from ₹10 lakh to ₹1 crore to SC, ST, and women entrepreneurs for establishing greenfield enterprises. The PM Street Vendor's Atmanirbhar Nidhi (PM SVANidhi) scheme, launched in CY 2020, provides collateral-free working capital loans to street vendors. The Pradhan Mantri Mudra Yojana (PMMY), operational since April 2015, finances micro and small enterprises in manufacturing, trading, services, and allied agricultural activities. The operational experience of PMMY and PM SVANidhi provides empirical evidence on how graduated micro-credit delivery can foster financial inclusion, as examined in Box III.4.

### Box III.4: Micro-Credit as a pathway to financial inclusion: Evidence from PMMY and PM SVANidhi

Government-led micro-credit initiatives have emerged as pivotal instruments in India's financial inclusion architecture, extending formal credit access to segments that have historically relied on informal sources of credit. PMMY and PM SVANidhi schemes exemplify this approach, targeting micro-entrepreneurs with collateral-free lending designed to seed enterprise formation, stabilise livelihoods, and foster graduation into higher credit tiers.

<sup>50</sup> World Bank Global Findex Database 2025, <https://tinyurl.com/5zw8b69n>.

PMMY, launched in April 2015 with the mandate to 'fund the unfunded', has achieved considerable scale. By October 2025, the scheme had disbursed over ₹36.18 lakh crore across 55.45 crore loan accounts. Significantly, more than 10 crore accounts belong to first-time borrowers, underscoring its catalytic role in bringing new entrepreneurs into the formal financial system rather than merely refinancing existing businesses. The scheme's tiered structure, Shishu (up to ₹50,000), Kishore (₹50,000-₹5 lakh), and Tarun (₹5 lakh-₹10 lakh), enables credit to grow in tandem with enterprise development. In October 2024, Tarun Plus (₹10 lakh-₹20 lakh) was introduced for repeat borrowers with strong repayment records, further institutionalising this graduation pathway. Over the past ten years, the share of Shishu accounts declined from 92 per cent to 63 per cent, while the Kishore and Tarun segments expanded, with average ticket sizes nearly doubling for Shishu loans and reaching above ₹7 lakh for Tarun. This compositional shift indicates a maturing borrower base that is progressively accessing larger credit facilities.

PM SVANidhi employs a similar graduated credit model for street vendors, a segment comprising individuals who were largely excluded from formal financial services. In CY 2023, the Indian School of Business (ISB) conducted an impact assessment of the PM SVANidhi scheme. Subsequently, a follow-up report was released, which covered 5,130 PM SVANidhi beneficiaries across 99 urban local bodies for the year CY 2025. The survey reveals a clear progression through loan cycles: while 51.5 per cent remain in the first cycle, 32.3 per cent have advanced to the second, and 16.1 per cent to the third, a marked shift from 2023, when almost all were first-cycle borrowers. This progression correlates with measurable business outcomes. The average annualised business income among SVANidhi borrowers increased by 20 per cent between 2023 and 2025, outperforming India's nominal GDP growth of 9-10 per cent, the MSME Gross Value-Added growth of 16.9 per cent, and the modest 5 per cent profit gains previously reported in microcredit studies. Growth varied by cycle: first-cycle borrowers recorded 17 per cent income growth compared with 23 per cent among second-cycle and 24 per cent among third-cycle borrowers. Borrowers who invested in fixed assets reported substantially faster income growth, 33 per cent compared to 16 per cent for those using loans solely for working capital, indicating that asset creation, while less common, yields disproportionately large returns.

Both schemes demonstrate strong inclusivity metrics. Under PMMY, women entrepreneurs accessed 69 per cent of all microloans, amounting to ₹13.8 lakh crore across 34.8 crore accounts. Reach among historically underserved groups is substantial: ₹3.60 lakh crore across 9 crore accounts of SCs, ₹1.33 lakh crore across 3.07 crore accounts of STs, ₹7.4 lakh crore across 15.34 crore accounts of OBCs, and ₹3.31 lakh crore across 5.98 crore accounts of minorities. For PM SVANidhi, one-third of the beneficiaries are women, 45 per cent belong to the OBCs, 17 per cent to SCs, and 2 per cent to STs.

The welfare effects of PM SVANidhi extend beyond enterprise metrics. Improved incomes have led to housing upgrades for 39 per cent of households, better food access for 55 per cent, more affordable healthcare for 44 per cent, and enhanced educational opportunities for 50 per cent. These multidimensional gains demonstrate how access to credit can foster broader household resilience. The scheme has also accelerated digital adoption, with usage

of digital payments rising from 45 per cent in 2023 to 83 per cent in 2025. Formal credit access has expanded correspondingly; 30 per cent of borrowers now hold formal loans in addition to their SVANidhi borrowings, compared to just 9 per cent prior to the scheme.<sup>51</sup>

Notably, both schemes demonstrate strong repayment performance, validating the creditworthiness of segments that have been traditionally deemed unbankable. Under the PM SVANidhi scheme, the estimated NPA rate is below 10 per cent, comparing favourably with the broader microfinance sector. The primary reasons for missed instalments are income disruption and health shocks, suggesting that complementary measures, such as affordable health insurance, could further strengthen repayment. Similarly, the NPA ratio for PMMY (as a percentage of the total loan disbursed) stood at 3.31 per cent as of June 2025.<sup>52</sup>

The evidence from both schemes substantiates a virtuous cycle central to financial inclusion: credit access, repayment discipline, enterprise growth, and rising credit demand reinforce one another, progressively integrating borrowers into the formal financial system while strengthening their economic standing. Under the PM SVANidhi scheme, 66 per cent of borrowers expressed the need for additional loans, with average requirements rising from ₹38,000 in the first cycle to ₹86,500 in the third. This demand-side pull, combined with demonstrated repayment capacity, creates the foundation for sustainable credit deepening. Banks should take note. There is money on the table, and it is a rational economic response to take it.

Together, PMMY and PM SVANidhi demonstrate that well-designed micro-credit interventions can effectively integrate underserved populations into the formal financial system, generate measurable improvements in livelihoods, and establish the credit behaviours that underpin sustained access to finance.

3.50 Regulatory innovation is deepening financial inclusion in India. The account aggregator framework, a key DPI pillar, supplies lenders with verified data like bank transactions and GST records, enabling lending to underserved and first-time credit users. DPI payment interfaces, such as UPI, provide transaction data to assess creditworthiness. Box III.5 explores how UPI has driven financial inclusion and become a flagship success story.

#### **Box III.5: Can payment infrastructure improve overall financial deepening?**

While the expansion of bank accounts is a necessary foundation, it is the effective use of those accounts that ultimately determines whether financial inclusion translates into meaningful economic opportunity. A growing body of research shows that a public, interoperable payment infrastructure can play a catalytic role in this transition by converting basic access into active financial participation.

<sup>51</sup> Centre for Analytical Finance, Indian School of Business. (2025). PM SVANidhi impact assessment report – 2025. (In collaboration with the Ministry of Housing and Urban Affairs, Government of India).

<sup>52</sup> Lok Sabha Unstarred Question No. 2323 answered on 15 December 2025, <https://tinyurl.com/3755k6kj>

In particular, Shashwat Alok et al. (2024)<sup>53</sup> demonstrate how a digital payment layer such as UPI bridges the gap between account ownership and access to formal credit by generating verifiable transaction histories and sharply reducing transaction costs. Their study shows that digital public infrastructure reshapes credit markets by enabling banks and fintechs to expand lending across the risk spectrum, with fintechs playing a distinctive role in reaching new-to-credit borrowers who were previously excluded from formal finance. Regions with affordable internet and widespread bank account penetration experienced the strongest credit expansion, underscoring the layered nature of financial inclusion and the complementary roles of incumbents and new entrants.

Importantly, the growth in credit linked to digital payments did not come at the cost of higher default rates. On the contrary, richer transaction data allowed lenders to better identify underserved but creditworthy borrowers, enabling system-wide financial deepening without a deterioration in portfolio quality. This evidence highlights the power of publicly provided, interoperable infrastructure to support inclusion at scale and to align technological change with macro-level financial development.

Survey evidence reinforces these aggregate findings. Dubey and Purnanandam (2024)<sup>54</sup> show that UPI adoption is associated with higher economic output, while Artha Global's 2025 survey of 4,800 respondents across Maharashtra and Bihar provides a granular view of how digital payments are embedded in everyday economic life. Among users, UPI has become a general-purpose payment instrument, with at least 60 per cent using it across major transaction categories such as store purchases, peer-to-peer transfers, bill payments, and online commerce. Nearly 80 per cent reported using UPI for three or more distinct use cases, with broadly similar patterns across gender and rural-urban locations. This diversification suggests that once adopted, UPI quickly becomes an integral part of routine economic activity.

At the same time, digital payments are best understood as complementing, rather than abruptly displacing, cash. Over 90 per cent of UPI users continue to use cash regularly, reflecting a hybrid payments ecosystem that mirrors international experience. Rather than a simple transition to cashlessness, the evidence points to a gradual, layered evolution in which real-time payments expand choice, convenience, and efficiency while coexisting with established modes of exchange.

Despite UPI's remarkable reach, some access frictions remain, largely reflecting broader digital divides rather than resistance to the system itself. Therefore, the next phase of inclusion involves deepening digital capabilities, awareness, and confidence so that the benefits of UPI are more evenly distributed.

Looking ahead, the long-term sustainability of UPI will depend on aligning incentives across the ecosystem to support continued investment in infrastructure, reliability, and risk management, while preserving the openness and interoperability that underpin its success.

53 Alok, Shashwat et. al., Breaking Barriers to Financial Access: Cross-Platform Digital Payments and Credit Markets (2025). Working Paper 33259, <https://tinyurl.com/4cpue8kv>.

54 Dubey, T. S. and A. Purnanandam (2024, May). Can Cashless Payments Spur Economic Growth? University of Michigan Working Paper, <https://tinyurl.com/43ntsfeK>.

The zero-cost, public-good design has been central to rapid adoption, particularly among small merchants, and has enabled digital payments to become a default option for everyday transactions.

Overall, the evidence points to UPI as a cornerstone of India's financial deepening. Its significance lies not only in scale, but in how it has integrated digital payments into routine economic life, strengthened the link between access and credit, and created a platform for inclusive growth. The next set of priorities are less about whether the model works, and more about how to consolidate and extend its gains through complementary investments in digital capability and institutional capacity as the system continues to evolve and expand to include more users.

3.51 All the above efforts are reflected in the RBI's Financial Inclusion (FI) Index,<sup>55</sup> which measures the country's progress in achieving financial inclusion. It captures data on 97 indicators related to banking, investments, insurance, postal, and pension sectors across three dimensions: access, usage, and quality. These dimensions are represented through three sub-indices, viz., FI-access, FI-usage, and FI-quality.<sup>56</sup> The composite FI-Index value rose to 67.0 in March 2025 from 64.2 in March 2024, with all sub-indices registering steady growth.

### Performance of the Insolvency and Bankruptcy Code

3.52 While financial intermediaries fulfil their role in extending credit to diverse economic agents, debtors may occasionally encounter difficulties in their endeavours. This necessitates the implementation of mechanisms to rehabilitate their financial standing or facilitate an honourable exit. It is towards this end that the IBC established a unified framework for resolving corporate distress in India, replacing the earlier fragmented regime of multiple statutes with overlapping jurisdictions. The Code enables financially distressed businesses to be reorganised through a creditor-driven resolution process within defined timelines or liquidated when continuation is not viable. Over nine years, IBC has contributed to improved credit discipline, a reduction in banking sector NPAs, and greater predictability in insolvency outcomes.

3.53 Reflecting these systemic improvements, S&P Global Ratings upgraded India's

<sup>55</sup> The FI-Index has been conceptualised as a comprehensive index incorporating details of banking, investments, insurance, postal, as well as the pension sector, in consultation with the Government and respective sectoral regulators. The index captures information on various aspects of financial inclusion in a single value ranging between 0 and 100, where 0 represents complete financial exclusion, and 100 indicates full financial inclusion. The FI-Index comprises three broad parameters (weights indicated in brackets), namely Access (35%), Usage (45%), and Quality (20%), each consisting of various dimensions that are computed based on a number of indicators.

<sup>56</sup> The 'Access' sub-index covers the availability of the supply side of financial inclusion through physical and digital infrastructure. The 'Usage' sub-index reflects the demand for financial inclusion as is reflected by the total number of credit accounts, volume and value of UPI transactions etc. Finally, the 'Quality' sub-index reflects aspects such as financial literacy, consumer protection and inequality.

insolvency regime from 'Group C' to 'Group B' on 3 December 2025.<sup>57</sup> The rating agency noted that average recovery rates have improved from 15-20 per cent under the pre-IBC regime to approximately 30 per cent, while resolution timelines have reduced from 6-8 years to about 2 years. Secured creditors, in particular, have experienced significantly higher recoveries. The Report has also acknowledged the role of judicial reinforcement of creditor rights, which have contributed to greater predictability and discipline in the resolution process.

3.54 Out of the corporate insolvency resolution process (CIRP) proceedings closed as of September 2025, 57 per cent resulted in going-concern rescue (1,300 through resolution plans, 1,342 through appeal/review/settlement, and 1,223 withdrawn under Section 12A), while 43 per cent ended in liquidation orders affecting 2,896 firms. Over time, the resolution-to-liquidation ratio has improved from 20 per cent in FY18 to 91 per cent in FY25.<sup>58</sup>

3.55 From the 1300 cases that resulted in a resolution process, creditors realised ₹3.99 lakh crore. Creditors recovered 94 per cent of the fair value of resolved businesses,<sup>59</sup> and 170 per cent of what they would have received through liquidation. While the haircut relative to fair value was approximately 6 per cent, it was 67 per cent relative to admitted claims. The data indicate that resolution, where feasible, delivers significantly better outcomes for creditors than liquidation.

3.56 A comprehensive study by IIM Bangalore documents a measurable improvement in credit discipline since IBC's enactment.<sup>60</sup> The study utilises nearly 6 crore corporate loan filings made between 2018 to 2024. As the study finds, the proportion of overdue corporate loan amounts relative to total outstanding fell from 18 per cent in 2018 to 9 per cent in 2024. Further there is a decrease in the average number of days for accounts to transition from overdue to normal category and from default to normal category during the period 2019 to 2024 (Chart III.12).

---

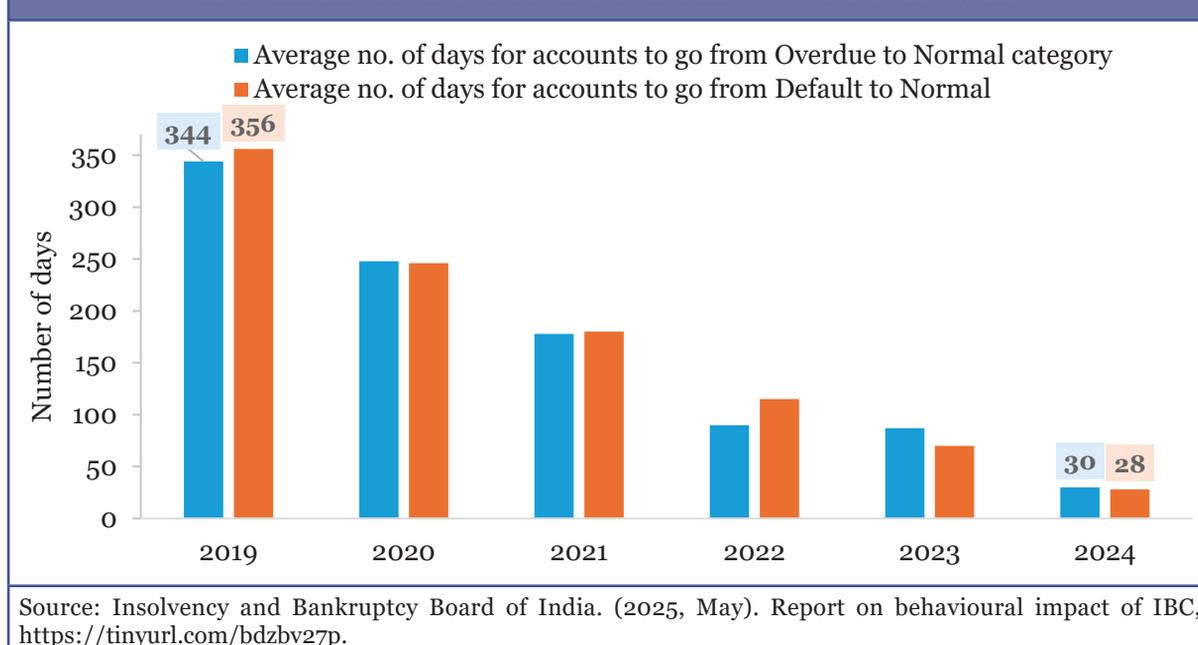
57 Rankings are grouped into Group A (most efficient), Group B (moderately effective), and Group C (least effective).

58 Insolvency and Bankruptcy Board of India. (2025, June 30). Quarterly newsletter for April–June 2025, <https://tinyurl.com/3bsvrfff>.

59 Based on 1177 cases where fair value has been estimated.

60 Insolvency and Bankruptcy Board of India. (2025, May). Report on behavioural impact of IBC, <https://tinyurl.com/bdzbv27p>.

Chart III.12: Trend of Transition Time- Overdue Accounts



3.57 The study observed that financially distressed firms (defined as those with an interest coverage ratio below 1 and leverage in the highest quartile) experienced a 3 per cent reduction in the cost of debt relative to non-distressed firms following IBC implementation, suggesting improved credit access for viable but stressed enterprises. Further, corporate governance indicators also improved. The proportion of independent directors on company boards increased by 2.84 per cent after the implementation of the IBC, with distressed firms showing an increase of 2.52 per cent.

3.58 A subsection of the study examines 51 banks between 2010 and 2024. Controlling for bank-specific characteristics, the study observes that IBC implementation is associated with a reduction in the Net NPA to Net Advances ratio of approximately 0.96 per cent.

3.59 Notwithstanding the structural shifts brought about by IBC, the bankruptcy regime still offers scope for significant improvement. Primary among the issues is the presence of a binding institutional constraint, leading to insolvency proceedings that often stretch beyond their mandated timelines. The Code mandates CIRP completion within 330 days, including extensions; actual average duration is 713 days overall and 853 days for cases closed in FY25. This represents a deviation of over 150 per cent from the statutory limit.<sup>61</sup>

<sup>61</sup> The contents of this section use data from the Standing Committee on Finance. (2025, December). Review of working of Insolvency and Bankruptcy Code and emerging issues (Twenty-eighth report). Lok Sabha Secretariat, <https://tinyurl.com/mr45a84x>.

3.60 Compounding the insolvency timelines, the National Company Law Tribunal (NCLT) holds a pendency of nearly 30,600 cases (as of March 2025) with an estimated clearance time of nearly 10 years at current disposal rates. Such extended timelines can trigger value erosion - assets deteriorate, employees depart, customers shift to competitors, and supplier relationships break down.

3.61 The institutional constraint is present at the level of the courts as well as at the level of the Resolution Professionals (RPs).<sup>62</sup> Only 30 NCLT benches handle cases across IBC and Companies Act jurisdictions, and RPs are also in short number. Of 4,527 registered RPs, only 2,198 (49 per cent) hold active Authorisation for Assignment.

3.62 In light of the extended insolvency timelines, the Pre-Packaged Insolvency Resolution Process (PPIRP) was introduced in 2021 to provide a simpler, faster, and less costly resolution. However, PPIRP has seen only 14 admissions in four years. The reasons behind the low take-up include procedural complexity that is inappropriate for the target segment, a lack of awareness among MSME promoters and lenders, trust deficits regarding debtor-led processes, and the inability of small enterprises to fund the process.

3.63 Recognising these challenges, the IBC Amendment Bill 2025<sup>63</sup> proposes a range of measures aimed at addressing procedural delays within the system. It also proposes a framework for cross-border insolvency proceedings. While the previous decade offered testament to IBC's legal framework and design, the next phase of IBC should combine process reform with a rapid scaling of capacity.

## Development in the capital markets

3.64 Capital markets help finance economic growth by channelising savings to investments. They are catalysts for wealth creation in the economy. The year FY26, so far, has been eventful for the economies and markets worldwide, including those in India. In the midst of continuous shifts in trade policies and exacerbated uncertainties, India's equity markets exhibited a phase of measured yet resilient performance, reflecting the interplay of supportive policies, macroeconomic conditions and sustained domestic investor participation. The imposition of US tariff sanctions, weaker-than-expected corporate earnings in Q1 FY26 and foreign capital outflows collectively weighed on market sentiment. However, a series of measures, including a personal income tax cut, a GST overhaul, easing of monetary policy, and receding inflation, as well as improved corporate performance in Q2 FY26, supported the market during the period.

---

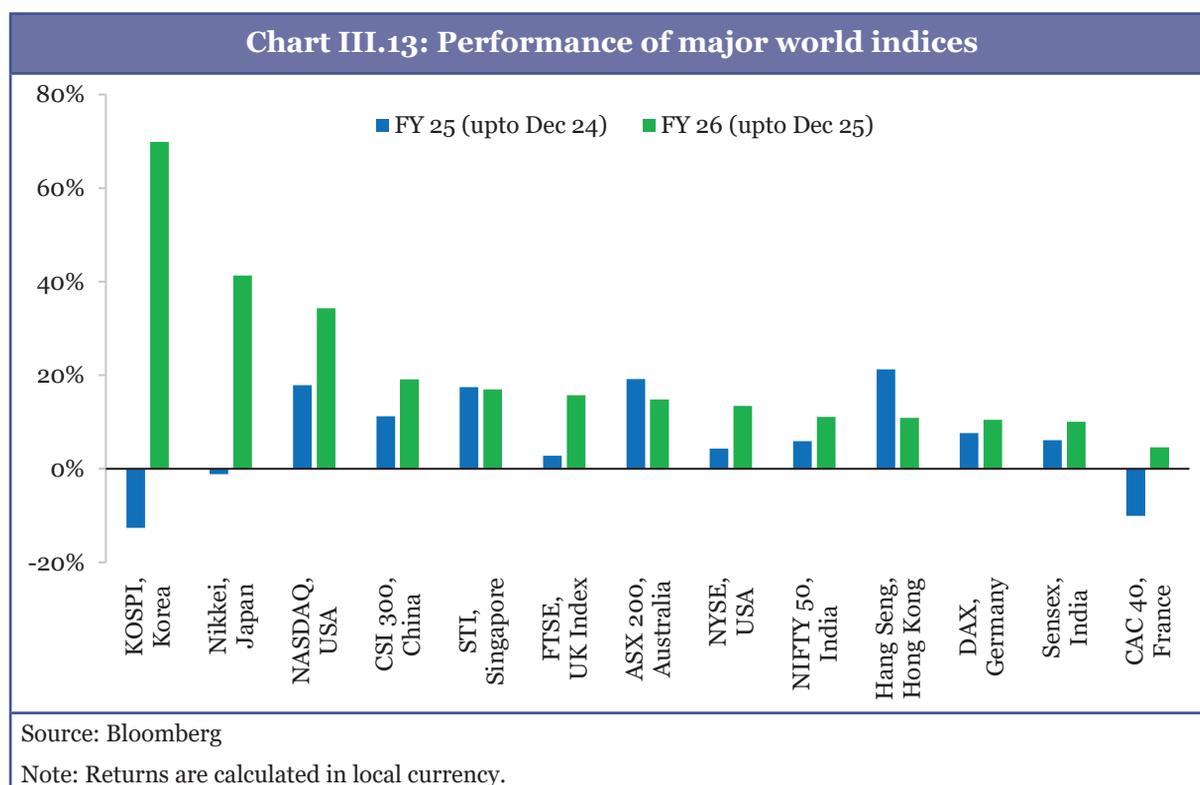
<sup>62</sup> Resolution professionals are certified individuals tasked with managing the insolvency process.

<sup>63</sup> The bill was introduced in the Lok Sabha in August 2025 and referred to a Select Committee. The Committee has since submitted its report in December 2025.

3.65 Nifty 50 and BSE Sensex registered gains of approximately 11.1 per cent and 10.1 per cent, respectively, during April-December 2025, marking a period of correction and consolidation following the robust rally observed in the preceding fiscal year.

3.66 In comparative terms, India's equity market performance was subdued relative to its global peers such as South Korea (KOSPI), the US's NASDAQ, Japan's Nikkei, China's CSI 300 and Singapore's STI. In India, sectoral trends reflected the broader macroeconomic narrative. Financial, capital goods, and consumer-oriented sectors outperformed, supported by healthy credit growth and domestic consumption, while IT and export-driven segments lagged amid muted external demand.

3.67 Reflecting the strength of India's financial ecosystem, the primary markets in FY26 (up to December 2025) remained resilient and vibrant, leading the world in initial public offers (IPOs) issuances. This strong performance was underpinned by sound macroeconomic fundamentals, robust investor participation and the continued fine-tuning of regulatory frameworks by SEBI, despite global headwinds. India's primary markets continued to attract both domestic and international investors, reinforcing the country's position as a key driver of global capital formation.



3.68 The total resource mobilisation from primary markets, encompassing both debt and equity, stands at ₹10.7 lakh crore during FY26 (till December 2025). Over the past five years, from FY22 to FY26 (till December 2025), India's primary markets have been

instrumental in channelising savings into productive investments, mobilising a total of ₹53 lakh crore through equity and debt issuances. Of this, ₹14 lakh crore was raised through equity issuances.

3.69 IPO volumes in FY26 (up to December 2025) were 20 per cent higher than FY25, and the amount mobilised was 10 per cent higher than the corresponding period of FY25. Listings on the main board, the primary market for established companies meeting stricter regulatory and size thresholds, rose from 69 to 94, with the amount raised increasing from ₹1,46,534 crore to ₹1,60,273 crore. A notable feature of IPO activity in FY26 (up to December 2025) was the prominence of Offer for Sale (OFS) components, where existing shareholders sell their stakes rather than the company issuing new shares. OFS accounted for 58 per cent of the total proceeds.

3.70 The activity in the small and medium (SME) segment also continued to exhibit a buoyant trend during FY26, reflecting sustained investor interest and growing confidence in emerging enterprises. The number of SME listings in FY 26 (up to December 2025) increased to 217 from 190 in FY25 (up to December 2024). The amount mobilised increased from ₹7,453 crore to ₹9,635 crore. Since its inception, more than 1,380 companies have been listed on the SME platforms of BSE and NSE, cumulatively raising over ₹35,000 crore, highlighting the expanding footprint of India's entrepreneurial base within the formal capital market framework. Of these, around 350 companies have migrated to the mainboard platform, underscoring the role of SME exchanges as a stepping stone for high-potential firms.

3.71 The sustained mobilisation of resources through primary markets and the widening participation of emerging enterprises through SME platforms point to the increasing breadth and sophistication of India's capital markets. As market activity scales up and new intermediaries and instruments proliferate, the quality of regulatory governance becomes central to preserving market integrity. In this context, the Securities Markets Code, 2025, represents an important step towards consolidating the legal framework and strengthening the foundations of securities market regulation.

#### **Box III.6: Reinventing Market Regulation: Securities Markets Code, 2025**

The Securities Markets Code, 2025 (SMC), was introduced in Lok Sabha on 18 December 2025, fulfilling a commitment announced in the Union Budget 2021-22.<sup>64</sup> It repeals and replaces the Securities Contracts (Regulation) Act, 1956, the SEBI Act, 1992, and the Depositories Act, 1996, thereby consolidating the fragmented laws governing India's securities markets. The Code spans subjects such as board composition, independence, conflict management, transparency, regulatory sandboxing, investor protection, governance of market

<sup>64</sup> The Bill has since been referred to a Standing Committee for examination.

infrastructure institutions (MIIs), and ease of doing business. These reforms can be categorised into three main clusters.

### (1) Mechanisms for the delivery of services

SEBI has quasi-legislative, executive, and quasi-judicial powers. The SMC makes various provisions on the manner in which these services are delivered.

**Rule-Making:** Given SEBI's wide-ranging quasi-legislative, executive, and quasi-judicial powers, the SMC seeks to make rulemaking transparent, consultative, and accountable. Regulations must undergo public consultation through the publication of drafts, solicitation of comments, and disclosure of feedback. The Governing Board, which must include up to six independent members, can alone frame regulations, ensuring that diverse, non-executive perspectives shape policy. Reviews of regulations are mandatory, except in cases of urgency.

The governance framework also extends to MIIs' bylaws, which must align with the Code's objectives, guarantee equal access, prevent market abuse, and promote transparency and interoperability. These, too, require public consultation and approval from SEBI. Even government-made rules must undergo prior publication.

**Adjudication:** Historically, SEBI's interim orders lingered for years, effectively penalising individuals longer than warranted. The SMC caps the validity of interim orders at 180 days, extendable only by reasoned decisions of designated board members, with a maximum limit of two years. Interim measures remain temporary, preventing misuse of prolonged enforcement.

**Executive Action:** The SMC establishes a unified registration and licensing framework that covers application, scrutiny, and surrender, embedding due process at every stage. Investigations and inspections need written orders, specified time limits, and extensions based on recorded reasons. Enforcers must quantify unlawful gains or investor losses to ensure accountability. No inspection or investigation may begin more than eight years after a contravention, reinforcing fairness and predictability.

### (2) Regulatory Governance

The Code places regulatory governance at the centre across three key pillars:

**Board Composition:** The SEBI board currently comprises nine members; however, under the SMC, the number of members appointed by the central government increases to 15, with at least five full-time members. The broader composition ensures diversity of expertise across law, economics, and market operations, with at least three members required to have experience in securities markets. This blend of professionals is intended to strengthen deliberations and internal accountability.

**Independence:** The Code safeguards SEBI's autonomy over rulemaking, inspections, and enforcement, free from executive interference. It preserves financial and staffing independence and codifies institutional safeguards - eligibility standards, fixed tenures, removal protections, and post-employment cooling periods that bar immediate work with

government, intermediaries, or market participants. Such measures preserve both functional and perceived independence.

**Accountability:** Transparency is reinforced through a publicly accessible electronic database of regulations, orders, and instructions. SEBI must make its regulations governing meetings of the Governing Board public and disclose the decisions of its board. The Code also requires regular research, impact assessments, and performance audits of both the regulator and the market ecosystem, with mandatory publication of results. SEBI is required to periodically review the proportionality and effectiveness of its regulations, preferably through independent external evaluations - a standard SEBI already applies to MIIs.

### **(3) Market Infrastructure Institutions**

For the first time, the Code brings MIIs, stock exchanges, clearing corporations, depositories, and others, onto a clear statutory footing, formally recognising them as entities performing vital public functions. Previously treated as regulated market utilities, MIIs are now positioned as statutory organs of governance with clearly assigned responsibilities. The Code permits SEBI to delegate regulatory powers, such as intermediary registration, to MIIs, provided they uphold procedural fairness, natural justice, and confidentiality. Decisions must be reasoned, and affected parties retain a right to be heard. MIIs may also regulate certain classes of market participants, elevating their role from operational to quasi-regulatory. Under the SMC, MIIs must be registered, not merely recognised, giving them statutory existence subject to ongoing supervisory and governance standards. Registration confers legal status and establishes accountability mechanisms, including the possibility of supersession in cases where governance fails.

### **Conclusion**

The SMC's framework extends beyond the securities market, serving as a potential model for regulatory governance across India's wider financial and administrative sectors. Its principles—transparency, consultation, proportionality, and accountability—could guide the creation of other regulators or the reform of existing ones.

By codifying SEBI's pioneering regulatory model, the SMC cements India's leadership in designing modern financial oversight architecture. If implemented in both letter and spirit, it could restore and strengthen trust among regulators, market participants, and investors. The ultimate test will be how deeply these governance standards embed themselves into everyday regulatory practice and whether they inspire similar transformation across India's regulatory landscape.

## **Broadening retail participation in capital markets**

3.72 Since the pandemic, domestic retail participation has witnessed an unprecedented surge, both direct (trading in markets through their demat accounts) and indirect channels (through mutual funds). Stable macroeconomic fundamentals, corporate earnings prospects, technological innovations enabling seamless investor onboarding

through simplified KYC processes and strong regulatory oversight have collectively contributed to this expansion, thereby financializing savings from traditional channels to formal financial assets. Findings from SEBI's Investor Survey 2025 further underscores this transformation, as nearly 63 per cent of the households surveyed are aware of at least one securities market product.<sup>65</sup>

3.73 During FY26 (till December 2025), 235 lakh of demat accounts were added, pushing the total count beyond 21.6 crore. A key milestone was the crossing of the 12-crore mark for unique investors in September 2025, with nearly a fourth of them being women. The mutual fund industry also expanded, with 5.9 crore unique investors as at the end of December 2025, of which 3.5 crore (as of November 2025) were from non-tier-I and tier-II cities, underscoring the diffusion of financial participation beyond traditional urban centres. Box III.7 examines the evolution of household financial savings over time in the country.

#### Box III.7: Evolving patterns of household financial savings in India

The composition of household financial savings in India has undergone a significant shift over the past decade, indicating a deeper reconfiguration in how households allocate incremental financial resources. This transition has been marked by a gradual but persistent movement towards market-linked instruments, particularly equities, reflecting both structural changes in the financial system and evolving household risk preferences. Equity investments, which were once ancillary to household balance sheets, have increasingly become a significant component of financial wealth, supported by broader participation and more diversified channels of access. Beyond equities, the development of debt-linked instrument markets is a logical next step towards achieving balanced, diversified portfolios and meeting long-term financial goals.

A salient feature of the shift to equities is the increasing share of individuals in aggregate equity market ownership, achieved through both direct and indirect channels. The share of individual investors increased from ~11 per cent in FY14 to 14.3 per cent in FY19, and further to 18.8 per cent by September 2025. In absolute terms, individual equity holdings expanded to around ₹84 lakh crore by September 2025, from just 8 lakh crore in FY14. While the direct share of individuals in equity markets increased only gradually, from just under 8 per cent in FY14 to approximately 9.6 per cent by September 2025, the indirect share nearly tripled over the same period, reaching 9.2 per cent. Between April 2020 to September 2025, household equity wealth is estimated to have increased by about ₹53 lakh crore, underscoring the role of sustained participation in driving long-term wealth creation in equity markets.

The evolving equity orientation is also evident in the flow of household financial savings. Between FY12 and FY25, gross financial savings increased substantially, accompanied by a notable reallocation across instruments. The share of equity and mutual funds in annual

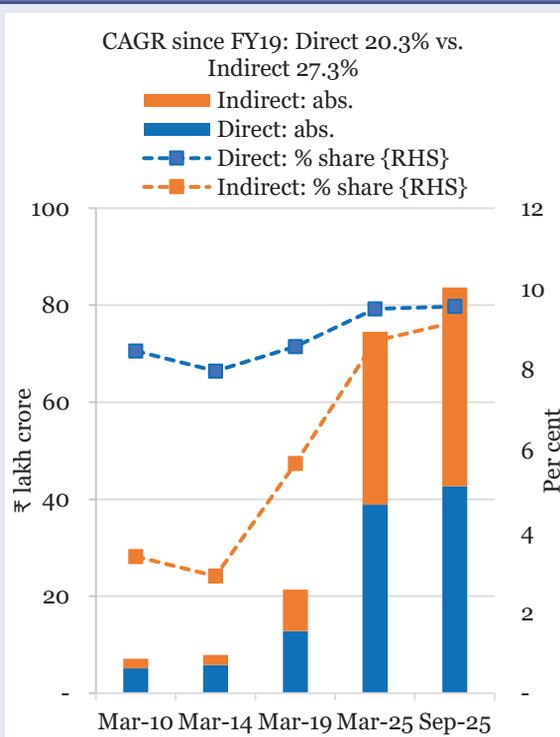
<sup>65</sup> SEBI's Investor Survey 2025, <https://tinyurl.com/mrw33mrn>.

household financial savings increased from ~2 per cent in FY12 to over 15.2 per cent in FY25. This shift has coincided with a steady rise in SIP contributions, with average monthly SIP flows increasing seven times from under ₹4,000 crore in FY17 to over Rs 28,000 crore in FY26 (April-November).

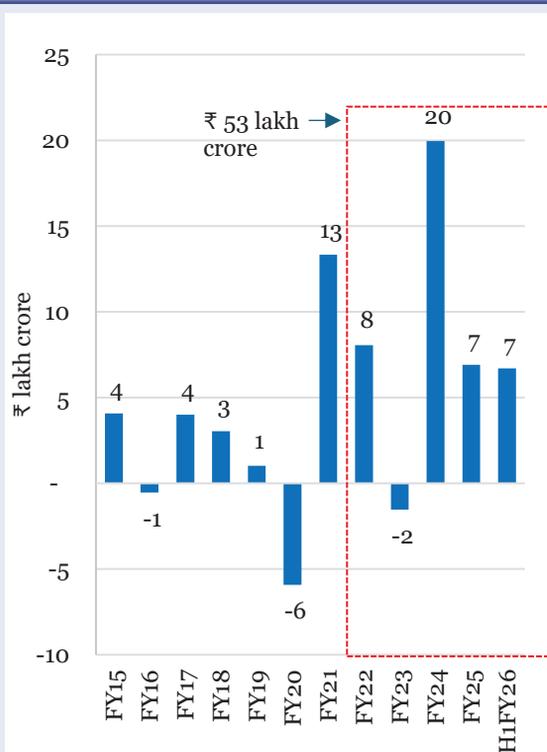
The growing prevalence of systematic investments reflects a shift towards long-term and sustained household engagement with savings being channelled in a disciplined manner across market cycles. In contrast, the share of deposits declined from over 58 per cent in FY12 to around 35 per cent in FY25, after having fallen to as low as 31.9 per cent in FY22. This pattern suggests portfolio diversification rather than displacement, with households adding equity exposure to their existing savings rather than substituting entirely away from traditional instruments.

From a stock perspective, the rebalancing is equally evident in household balance sheets. According to RBI data, the share of equity and investment funds in total household financial assets increased from 15.7 per cent in March 2019 to 23 per cent by March 2025. Assets managed through mutual funds rose steadily relative to the size of the economy, increasing from <10 per cent of GDP in the early 2010s to ~23 per cent by FY26 (as of November 2025), amounting to over ₹80 lakh crore.

**Chart III.14: Ownership trends of individual investors**

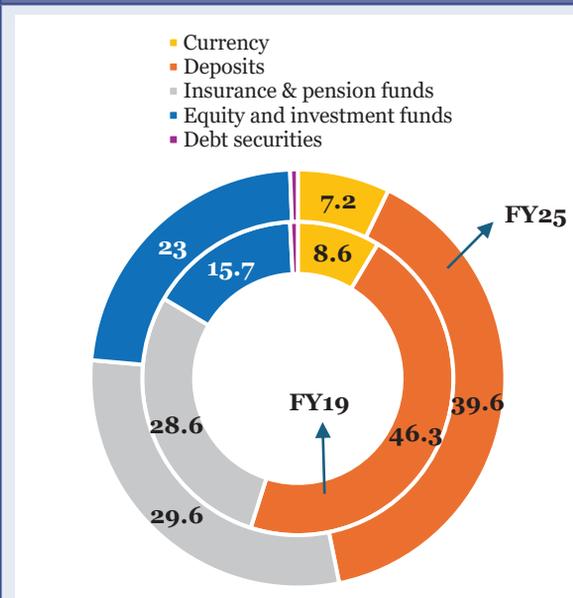


**Chart III.15: Household wealth accretion in Indian equities\***

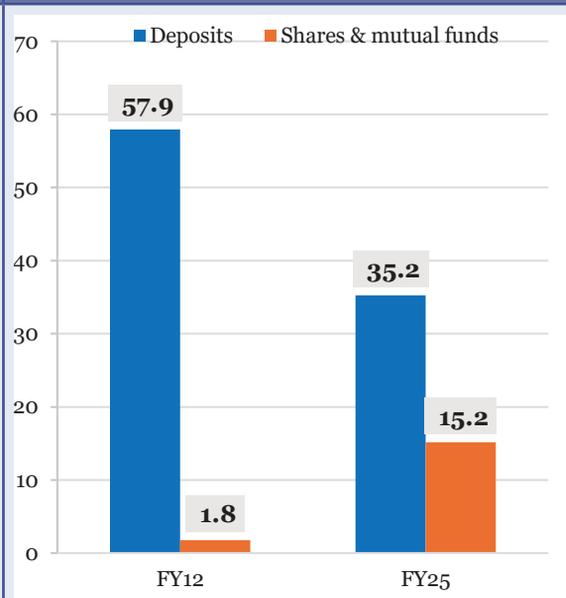


Source: NSE EPR. Notes: 1) Direct is defined as the direct equity holdings, while indirect is the equity holdings through mutual funds by individuals. 2)\* NSE-listed companies considered for the analysis.

**Chart III.16: Composition of financial assets in FY19 vs FY25**



**Chart III.17: Composition of annual financial savings for select products (% share)**



Source: NSE EPR. Notes: 1) Direct is defined as the direct equity holdings, while indirect is the equity holdings through mutual funds by individuals. 2)\* NSE-listed companies considered for the analysis.

The post-pandemic period marked a decisive inflexion in household engagement with equity markets. The unique investor base expanded sharply in the initial years following the pandemic, rising from around 3.1 crore in FY20 to over 11 crore by FY25. Although net additions to the investor base have moderated in the current fiscal, net inflows of domestic investors into equity markets have remained resilient. Over the past five years, cumulative inflows by domestic investors into the equity markets have been substantially higher than from foreign investors. This shift highlights the increasing ability of domestic savings to support equity markets, stabilise the market, and mitigate the volatility associated with external capital flows.

A well-diversified portfolio should include adequate exposure across a broad range of asset classes. In this context, participation in debt, specifically market-based debt instruments, has not kept pace with the significant reorientation of household savings towards equities. The household ownership share of deposits has decreased, while that of pension and insurance assets has remained almost unchanged over the period from FY19 to FY24.

Retail engagement with corporate bonds and debt-oriented investment products remains limited, resulting in debt securities comprising a small portion of household financial assets. This limited participation of households in market-based debt instruments is mirrored in the overall shallow depth of India's corporate bond market. India's corporate bond market remains underdeveloped, accounting for around 16-17 per cent of GDP, compared with the equity market capitalisation of over 130 per cent of GDP. This is substantially lower than in major peer economies, such as the United States and China, where corporate bond markets constitute approximately 40 per cent and 36 per cent of GDP, as of 2024, respectively.

Developing a deep debt capital market requires market participants—issuers, investors, arrangers, and rating agencies—to act as market-builders. Key imperatives include enhancing transparency, pricing risk honestly beyond the siloes of AAA-rated bonds, and ensuring financial innovation remains standardised. Mechanisms such as partial guarantees and blended finance can help mid-tier companies access bond markets, unlocking capital for this segment and driving India's future growth. Equally, a shift from passive buy-and-hold strategies to active trading is essential for building secondary market liquidity. A well-functioning debt market would reduce capital costs, mobilise savings efficiently, and offer households reliable income-generating products. India's households have embraced equities; extending that confidence to debt markets is the next frontier for building truly resilient portfolios and a mature financial system.

3.74 Responding to the steady expansion of India's capital market, SEBI has undertaken various steps throughout the current financial year in order to strengthen the regulatory framework, facilitate ease of doing business and investing, enhance investor protection and empowerment, and foster market development. These measures have been discussed in detail in Box III.8.

#### **Box III.8: SEBI's recent initiatives: Advancing regulatory excellence, market growth, and investor protection**

SEBI undertook a comprehensive suite of initiatives aimed at reinforcing regulatory integrity, streamlining market operations, and enhancing investor protection. Collectively, these measures underscore SEBI's commitment to fostering a transparent, resilient, and inclusive capital market ecosystem in India, while strengthening market confidence through improved verification, disclosure, accessibility, and risk surveillance across key segments of the securities market.

##### **Investor protection and empowerment**

To provide a verified and secure payment channel for financial transactions in the securities market, SEBI has mandated a new UPI address structure for all SEBI-registered intermediaries that collect funds from investors, effective 1 October 2025. Complementing this, the 'SEBI Check' was introduced to enable verification and enhance the safety and accessibility of investor payments. To combat financial fraud and scams, SEBI launched a joint media campaign titled 'SEBI vs SCAM' in collaboration with Market Infrastructure Institutions in July 2025, focusing on identifying red flags, raising awareness about verification protocols, trusted redressal mechanisms, and good digital practices. In parallel, a nationwide training initiative for block-level Panchayat representatives was launched in collaboration with the Ministry of Panchayati Raj (MoPR) to promote financial literacy and investor education at the grassroots level. Furthermore, SEBI mandated that all digital platforms of regulated entities comply with the provisions of the Rights of Persons with Disabilities Act, 2016, and corresponding rules, enabling the full and effective participation of persons with disabilities in the securities market.

### **Strengthening the bond market and expanding access**

SEBI introduced a new framework for ESG Debt Securities (other than green debt securities), outlining regulatory requirements for issuers of social, sustainability, and sustainability-linked bonds. To improve awareness and traction in municipal debt, outreach programmes on Municipal Bonds and Municipal Finance were organised, providing a common platform for stakeholders to discuss issuer concerns, investor requirements, and the extant regulatory framework, while also recommending measures to deepen the market. In support of municipal bond development, credit rating agencies were advised to extend the EL-based rating scale for rating municipal bonds issued to finance infrastructure assets, in addition to the standardised rating scale. Additionally, to facilitate ease of doing business and improve transparency and data dissemination to investors and credit rating agencies for the issuance of securitised debt instruments (SDI), SEBI aligned the guidelines for the issue and listing of SDIs with the RBI guidelines on Securitisation of Standard Assets.

### **Strengthening the regulatory framework and improving operational efficiency**

To facilitate SEBI-registered stock brokers in undertaking securities market-related activities in GIFT-IFSC under a Separate Business Unit, the requirement of obtaining specific SEBI approval was removed. Listed entities were mandated to follow industry standards on the ‘minimum information’ to be provided to the audit committee and shareholders for the approval of related-party transactions, thereby strengthening governance and review processes. SEBI also streamlined requirements pertaining to the minimum contribution from sponsors and sponsor groups in the public issue of units for the conversion of a private listed Infrastructure Investment Trust (InvIT) into a public InvIT. Further, registered intermediaries were permitted to use the ‘e-KYC Setu System’ of the National Payments Corporation of India as an alternative to Aadhaar-based e-KYC authentication.

### **Fostering market development and improving product depth**

To provide investors with independent verification of the risk and return claims of investment advisers, research analysts, and algorithmic trading providers, SEBI introduced a Past Risk and Return Verification Agency for risk-return performance verification; its operationalisation is in process. In the derivatives space, electricity derivatives, starting with monthly futures trading at NSE, were launched on 18 July 2025. SEBI and the Central Electricity Regulatory Commission adopted a robust, consultative, and data-driven approach to contract design and risk management norms, ensuring these derivatives function as hedging instruments rather than vehicles for undue speculation.

### **Measures to strengthen equity derivatives markets**

To curb expiry-day volatility and promote uniformity, exchanges were directed to select either Tuesday or Thursday as the expiry day for equity derivatives. SEBI also introduced revisions to improve trading convenience and strengthen monitoring, including a new methodology for calculating open interest as future equivalent open interest at a portfolio level using delta adjustments, recalibrating the market-wide position limit for single stocks, defining new eligibility criteria for derivatives on non-benchmark indices, and recalibrating

entity-level position limits based on the revised market-wide position limit definition. In addition to end-of-day monitoring, exchanges were directed to monitor position limits for equity index derivative contracts on an intraday basis.

## Debt market

3.75 A well-developed corporate bond market is indispensable to India's financial system and its path toward becoming a Viksit Bharat by 2047. Such a market channels institutional and household savings into productive sectors, strengthens efficient price discovery through a robust yield curve and supports the development of critical risk management instruments such as credit derivatives and securitisation. For the financial sector specifically, a deep corporate bond market reduces systemic concentration risk and dependence on bank-dominated financing, thereby strengthening overall financial stability. By diversifying funding sources, the corporate bond market enables banks to redirect resources toward priority sectors, including rural credit, infrastructure, and MSMEs, advancing financial inclusion while lowering systemic fragility. Additionally, a vibrant bond market helps to lower borrowing costs through competitive pricing and improved liquidity.

3.76 India's corporate bond market has demonstrated impressive growth, with outstanding issuances increasing from ₹17.5 trillion in FY15 to ₹53.6 trillion in FY25, growing with an annual rate of approximately 12 per cent. In FY25, the highest-ever fresh issuances were recorded, totalling ₹9.9 trillion. As of March 2025, the corporate bond market accounts for 15-16 per cent of the country's GDP and corporate bond fundraising now complements bank credit, reflecting growing investor confidence and a gradual shift towards market-based financing.

3.77 In FY26, the debt market accounted for over 63 per cent of total resource mobilisation from the primary market in April-December 2025. Government and SEBI initiatives to deepen the bond market contributed to the value of corporate bond issuances reaching ₹6.8 lakh crore by the end of December 2025. Private placements, accounting for more than 99 per cent of total resources mobilised through the bond market, remained the preferred mode.

3.78 Despite the recent progress, a significant potential remains untapped in the country compared to global peers: South Korea's corporate bond market is 79 per cent of its GDP, in Malaysia, it is 54 per cent of its GDP, and in China, 38 per cent. Furthermore, India's debt market is skewed towards highly rated borrowers (AAA or AA-rated), which accounts for 85-90 per cent of bond issuances. In contrast, the US presents a more liquid and mature corporate debt market catering to various segments. The US has less than five per cent of its bond issuances from AAA-rated categories, with

over 60 per cent of its issuances in the A- and BBB-rated categories. In India, with the dominance of private placements, public offerings remain limited, deterring access for small firms. The secondary market remains shallow, with India's annual bond turnover ratio in secondary markets at 0.3, lower than that of Indonesia (1.17) and China (1.16).<sup>66</sup>

3.79 The major issuers in the corporate debt market include Public Sector Undertakings, Public Financial Institutions, and banks. As of 31 December 2025, the market comprised 6,351 issuers with a total of 29,638 instruments outstanding. The principal investor base consists of banks, insurance companies, pension funds, mutual funds, and NBFCs. Out of approximately 30,000 ISINs,<sup>67</sup> only 400-500 ISINs are traded on a daily basis. New issuances are traded for a month or so, and then they are held until maturity, essentially becoming a type of investment. The daily average secondary market volume ranges from ₹7,000 crores to ₹10,000 crores. Only a small group of institutional investors participate in the primary markets, which limits the supply of bonds available for trading in the secondary market.

3.80 Institutional investors are shown to exhibit structural preferences influenced by return profiles, risk assessments, regulatory incentives, and prevailing market liquidity conditions. As a result, they tend to favour equities and government securities over corporate bonds. This trend may be contributing to the constraining of the corporate bond market's growth and development.<sup>68</sup>

3.81 As noted by the Niti Aayog Report, limitations also stem from regulatory overlaps between SEBI, RBI, and the Ministry of Corporate Affairs (MCA); extensive disclosure requirements that deter lower-rated issuers; restricted investment mandates for institutional investors, limiting their allocation to high-grade securities; and an underdeveloped risk management infrastructure. Additionally, weak debt recovery mechanisms, high transaction costs, and tax asymmetries reduce investor appetite and limit the flow of long-term capital.

3.82 The regulatory authorities have undertaken substantial reforms for the development of the bond market. SEBI introduced the Request for Quote platform, facilitating retail access, strengthening governance standards for credit rating agencies, and simplifying issuance norms. The RBI has enhanced settlement architecture through tri-party repos and credit default swap guidelines. The Government's promotion of InvIT and Real Estate Investment Trusts demonstrates a sustained commitment to long-term capital mobilisation.

66 NITI Aayog. (2025, December). Deepening the corporate bond market in India (Report), <https://tinyurl.com/27dha24u>.

67 International Securities Identification Numbers

68 Gupta, S., Kujur, K., & Arora, O. (2025). Bridging the gap: Unlocking retail participation in India's bond market (SSRN Scholarly Paper No. 5332702). Social Science Research Network.

3.83 However, coordinated and phased reforms are the need of the hour. These include streamlining inter-agency alignment through joint circulars that clarify responsibilities across the regulators, as well as establishing single-window contact systems for issuers. Strengthening investor confidence in corporate debt also requires enhancing the effectiveness of the insolvency framework so as to accelerate recovery timelines. Long-term structural development should prioritise upgrading market infrastructure through unified trading platforms and enhanced market-making capabilities, while expanding the investor base through targeted incentives, including simplified tax structures for bonds and regulatory flexibility for pension funds and insurance companies to invest in mid-rated securities.

3.84 A vibrant corporate bond market can help lower the cost of capital for Indian firms through competitive pricing, improved liquidity, and efficient price discovery. As the market deepens, towards a potential ₹100-120 trillion by 2030,<sup>69</sup> intermediation costs should decline, particularly for the mid-market segment, where much of India's manufacturing capacity and job creation will emerge. Realising this vision demands sustained, coordinated policy focus, technological innovation, and regulatory harmonisation.

3.85 However, financial deepening alone may not be sufficient to durably lower India's cost of capital. Box III.9 explores the structural drivers of capital costs, highlighting that the path to cheaper capital extends not only through financial markets but also through productivity and export competitiveness - themes central to India's development trajectory.

#### **Box III.9: What explains the persistently high cost of capital? - an exploration**

India's relatively high cost of capital is widely recognised as a constraint on private investment and long-run growth. For instance, over the past three decades, between 1995 and 2025, India's weighted average long-term interest rates<sup>70</sup> averaged 7.61 per cent, far above the average long-term rates seen in Canada (3.13), Italy (2.94) and Switzerland (1.04). Even so, India has maintained a favourable average long-term interest rate as compared to other emerging economies such as Indonesia (14.1), Mexico (11.05) and South Africa (9.08).

Much of the public discussion attributes this to financial-sector frictions – relatively shallow corporate bond markets, limited institutional investor depth, sovereign risk premia, and

69 NITI Aayog. (2025, December). Deepening the corporate bond market in India (Report), <https://tinyurl.com/27dha24u>.

70 Weighted long term interest rates is measured as a weighted average of central bank policy rates and 10-year government bond yields, weighted by the share of bank and market-based credit in total credit to the private non-financial sector.

regulatory restrictions on capital flows. While these factors influence the distribution of financing costs across firms and sectors, they do not fully explain the persistence of high economy-wide capital costs.

A more structural explanation for the high cost of capital in an economy links the cost of capital to the economy's savings position and external balance. In open-economy macroeconomics, investment must be financed either by domestic savings or by foreign savings; the latter is reflected in the current account deficit (CAD). Economies that run persistent CADs are, by construction, dependent on external capital inflows to support domestic investment and consumption. This dependence introduces a risk premium, which financial markets price into interest rates and equity returns.<sup>71</sup> In this sense, the cost of capital in CAD economies is not merely a financial-market outcome; it is also a price on the macroeconomic risk associated with a structural savings shortfall.

To empirically capture the structural relationship between the current account balance (CAB) and long-term interest rates, a panel data estimation is performed for 15 countries over the period from 1995 to 2025. The countries studied comprise a heterogeneous mix of developing and developed economies, which displayed floating or managed floating exchange rate regimes for the majority of the period in question. These include Australia, Brazil, Canada, France, Germany, India, Indonesia, Italy, Japan, South Korea, Mexico, Philippines, Thailand, South Africa and Switzerland.

The cost of capital is captured by a weighted average of Central bank policy rates and 10-year government bond yields, weighted by the share of bank and market-based credit in total credit to the private non-financial sector.

The pooled mean-group estimator developed by Pesaran, Shin and Smith, 1999<sup>72</sup> is employed to understand the long-run impact of these drivers on the interest rate.<sup>73</sup> The equation below captures the long-run relationship between interest rates and their drivers. The drivers of capital cost in the long run are given by the current account balance (CAB as a percentage of GDP), government debt (as a share of GDP), the extent of financial deepening measured by credit to the private sector (as a percentage of GDP), and GDP growth. Further, short-run interest rates are used to capture synchronous, cross-country monetary policy shifts which influence the trajectory of long-term interest rates. Finally, a trend term is incorporated to absorb global structural factors that may uniquely influence long-term rates (such as demographic factors, shifts in inflation expectations and rising demand for long-duration assets).

$$\Delta i_{it} = \alpha_i \text{govtdebt}_{i,t-1} + \beta_i \text{CAB}_{i,t-1} + \gamma_i \text{findpth}_{i,t-1} + \text{GDP growth}_{i,t-1} + \eta_i s_{i,t-1} + c_i \text{trend}_{i,t-1} + \mu_i + \epsilon_{i,t}$$

71 See for instance, Ben Salem, M., & Castelletti-Font, B. (2016). Which combination of fiscal and external imbalances to determine the long-run dynamics of sovereign bond yields. <https://tinyurl.com/242r9du6>.

72 Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled Mean Group Estimation of Dynamic Heterogeneous Panels. *Journal of the American Statistical Association*, 94(446), 621–634. <https://doi.org/10.1080/01621459.1999.10474156>.

73 The pooled-mean group estimation proves particularly useful for the analysis at hand, as it separates short-run country-specific effects from long-run patterns displayed across countries globally.

The results, reported in Table III.1, suggest that a one percentage point improvement in a country's CAB leads to a 2.8 basis point reduction in interest rates in the long run, while a one percentage point increase in private credit to GDP results in a 1.1 basis point decrease in rates. Thus, for the sample studied, improvements to the CAB proved nearly twice as effective in lowering the cost of capital over time as compared to financial deepening.

**Table III.1 – Impact of independent variables on long-run interest rates**

<b>Independent Variable</b>	<b>Co-efficient</b>
Current Account Balance	-2.8 bps**
Government Debt	+0.6 bps***
Financial depth	-1.08 bps***
GDP growth	0.67 bps**
Short-term interest rates	93.6 bps***
Trend	2.68 bps***

Note: '\*\*', '\*\*\*' denotes significance at the 5 per cent level and 1 per cent level, respectively.

### Policy Implications for India

The capacity to generate domestic savings at scale ultimately depends on productivity, operating margins and retained earnings in the production system. Labour productivity shapes unit labour costs, which in turn influence competitiveness and profitability. Profitability, in turn, feeds into retained earnings and corporate savings, and together with household savings, these constitute the pool of loanable funds that financial markets allocate. Where productivity and margins are thin, retained earnings are weak, corporate savings are low, and the economy becomes more reliant on external capital, raising the equilibrium cost of capital.

Rigidities in labour regulation and firm-scale dynamics have historically constrained capital deepening, learning by doing, and the movement of firms up the productivity ladder. Firms have often responded by remaining sub-scale or informalised to preserve flexibility, but this comes at the cost of productivity growth and margin durability. Alternatively, firms have sought protection from import competition to preserve their margins, but often to the detriment of their downstream competitiveness. The profitability thus generated has not been reinvested in productivity and innovation to the same extent, thereby hindering external competitiveness. The consequence is not simply slower manufacturing expansion, but an entrenched weakness in generating external surpluses, reinforcing reliance on foreign savings at the margin.

Historical experience across late-industrialising economies suggests that durable declines in capital costs tended to follow, rather than precede, periods of productivity-led expansion in manufacturing, sustained export growth and the emergence of external surpluses. In such phases, aggregate demand is supported by exports, inflationary pressures are more

contained, expectations of exchange-rate depreciation are lower, and the risk premium embedded in capital costs declines.

By contrast, growth patterns that rely disproportionately on domestic demand and credit-enabled consumption, without commensurate productivity and export gains, may raise near-term activity but do not materially strengthen surplus formation. In a structurally savings-short setting, this configuration tends to sustain a weaker currency and rollover-risk premium in domestic capital costs.

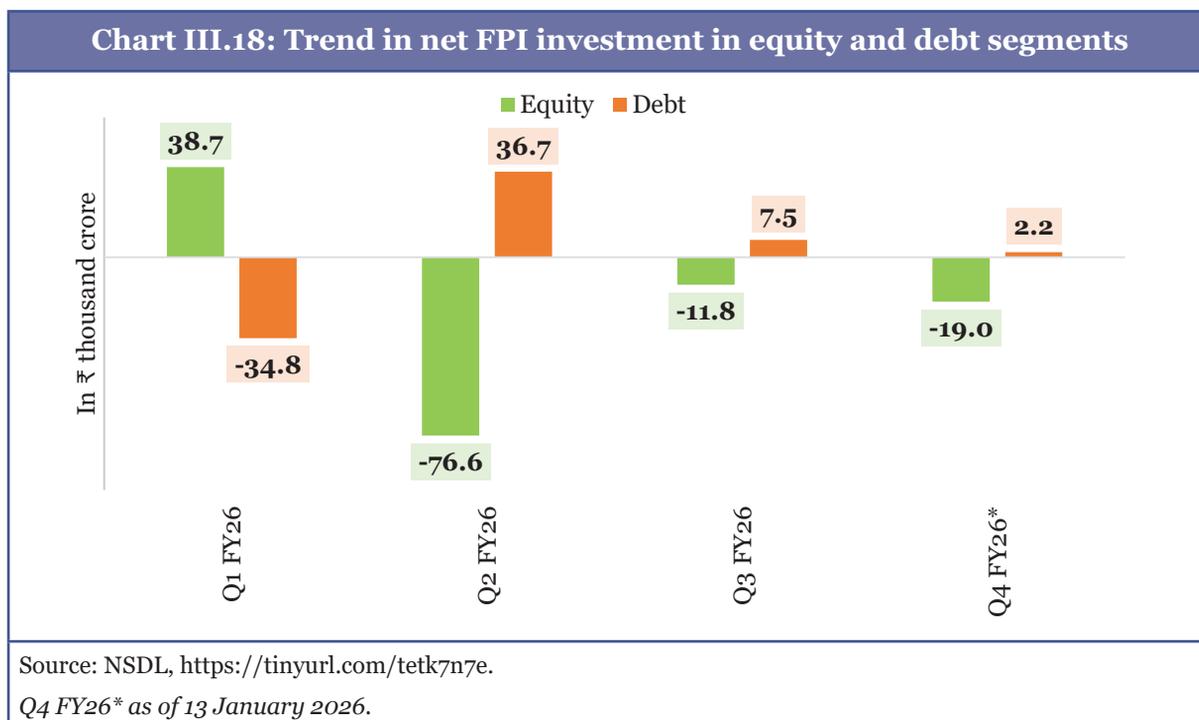
Financial-sector reforms remain important. Deeper bond markets, broader institutional participation, credible benchmarks and improved risk pricing can reduce intermediation costs and improve capital allocation. However, such reforms are most effective in environments where domestic savings are increasing and the external position is improving. Greater reliance on foreign capital can bridge temporary gaps but, when persistent, tends to elevate risk premia and narrow policy space—outcomes that are already reflected in the pricing of capital in CAD economies.

The strategic implication is that reducing India's cost of capital requires attention not only to financial intermediation but also to the drivers of production, exports, and surplus generation. Policies that support firm-level scale and deregulation, improve logistics, infrastructure, and trade facilitation, deepen technological capabilities and R&D, and enable sustained participation in global value chains can strengthen productivity and margins in manufacturing. As firms retain more earnings, corporate savings rise. As exports expand and trade and current account surpluses emerge and stabilise, dependence on foreign savings diminishes, expectations of depreciation moderate, and the external-balance component of the risk premium embedded in capital costs falls over time.

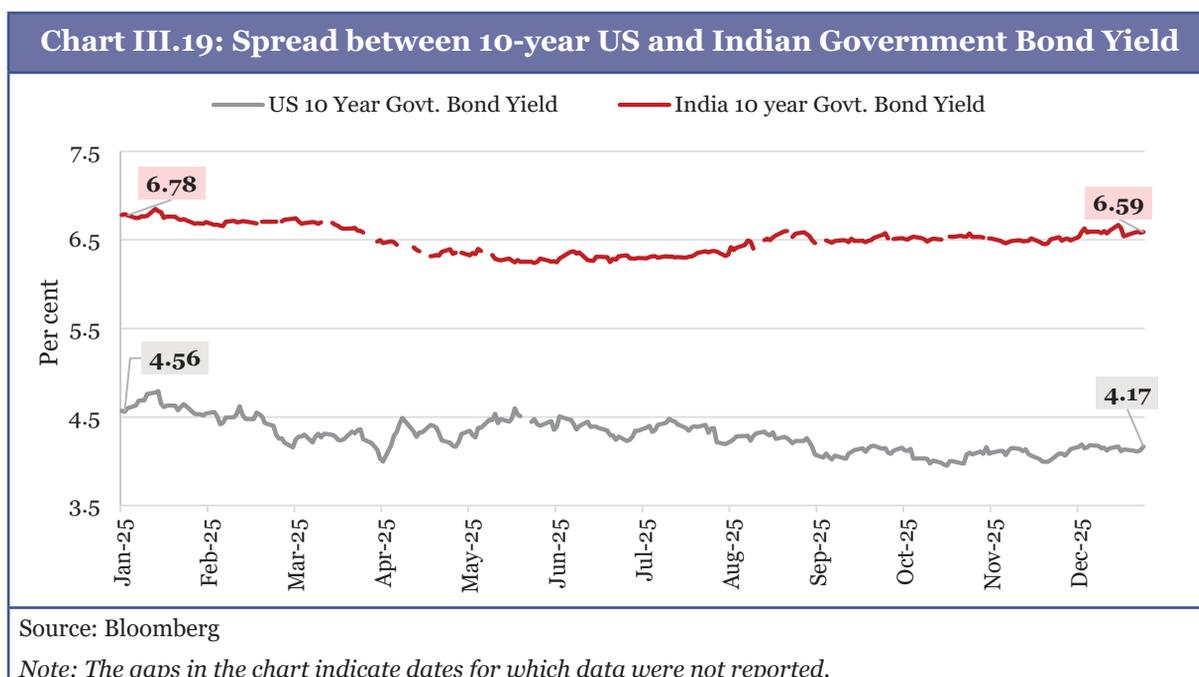
The durable route to a lower cost of capital is therefore inseparable from a growth pattern anchored in higher productivity, enhanced manufacturing competitiveness, sustained export growth, and the gradual transition from structural savings deficit to structural savings strength. Financial deepening can support and accelerate this transition, but it cannot substitute for it. Indeed, these are the recurring messages that run throughout this Economic Survey.

## Foreign Portfolio Investment

3.86 India's Foreign Portfolio Investment (FPI) trends in FY26 exhibit volatility. During Q1 FY26, FPIs were net buyers of Indian equities and net sellers of debt instruments. In contrast, in Q2 FY26 and Q3 FY26, they transitioned from being net buyers of equities to net sellers, while being net buyers of debt instruments. As of 13 January 2026, FPIs are net sellers of Indian equities with outflows amounting to ₹16.5 thousand crore.



3.87 Overall, FPIs were net sellers of Indian securities from April to December 2025. The relative underperformance of Indian equities compared to other major markets, alongside trade and policy uncertainties, the depreciation of the Indian rupee, and a broad-based global risk-off sentiment amid elevated U.S. bond yields, weighed on FPI flows. These factors dampened sentiment towards Indian equities, particularly export-oriented sectors such as IT and healthcare, resulting in continued FPI outflows in FY26 (April-December).

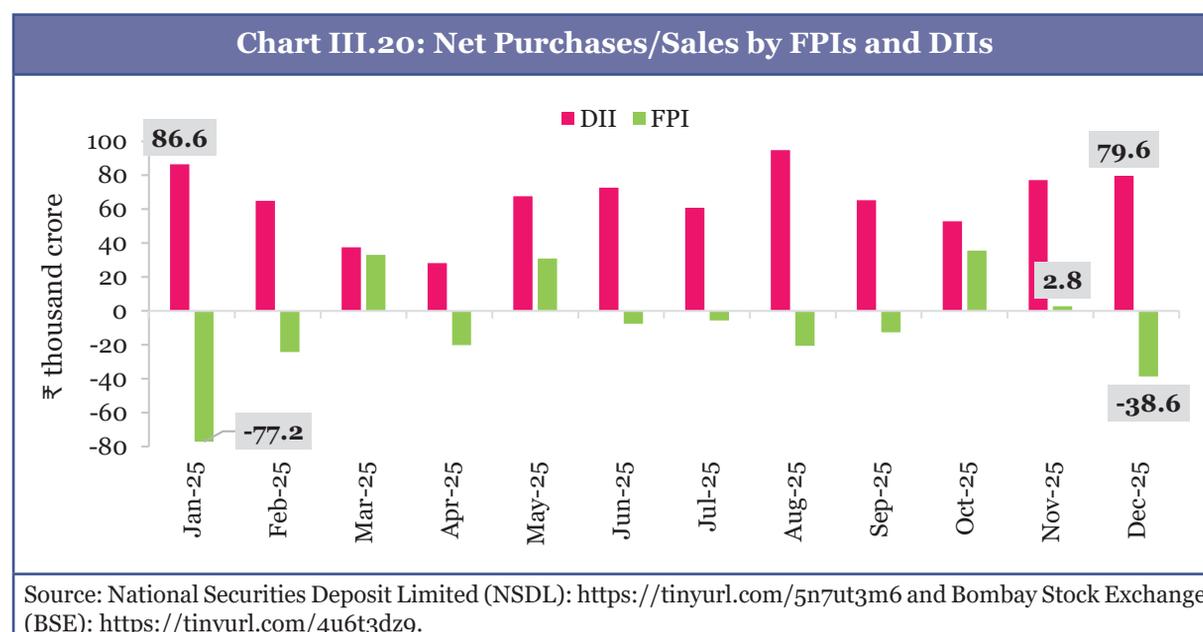


3.88 In late May 2025, the spread between 10-year Indian and US government bond yields narrowed to 165 basis points amid a stronger US dollar and falling Indian yields, reducing the relative attractiveness of Indian debt. However, by the end of 2025, as Indian yields rose and the dollar weakened, the spread widened to 250 basis points, improving the appeal of Indian bonds. Supported by SEBI's relaxation of FPI investment norms and ongoing India-US trade discussions, the outlook for FPI inflows into India's debt market remains positive.

3.89 As of 31 December 2025, the asset base under custody of FPIs stood at ₹81.4 lakh crore, marking a 10.4 per cent increase over March 31, 2025, driven largely by valuation gains in equities and steady accumulation in debt holdings.<sup>74</sup> Within NSE-listed equities, however, the share of FPI ownership declined to 16.9 per cent (for Q2 FY26), in line with global risk aversion and sectoral reallocations.

### Domestic Institutional Investors: Counterbalancing FPIs

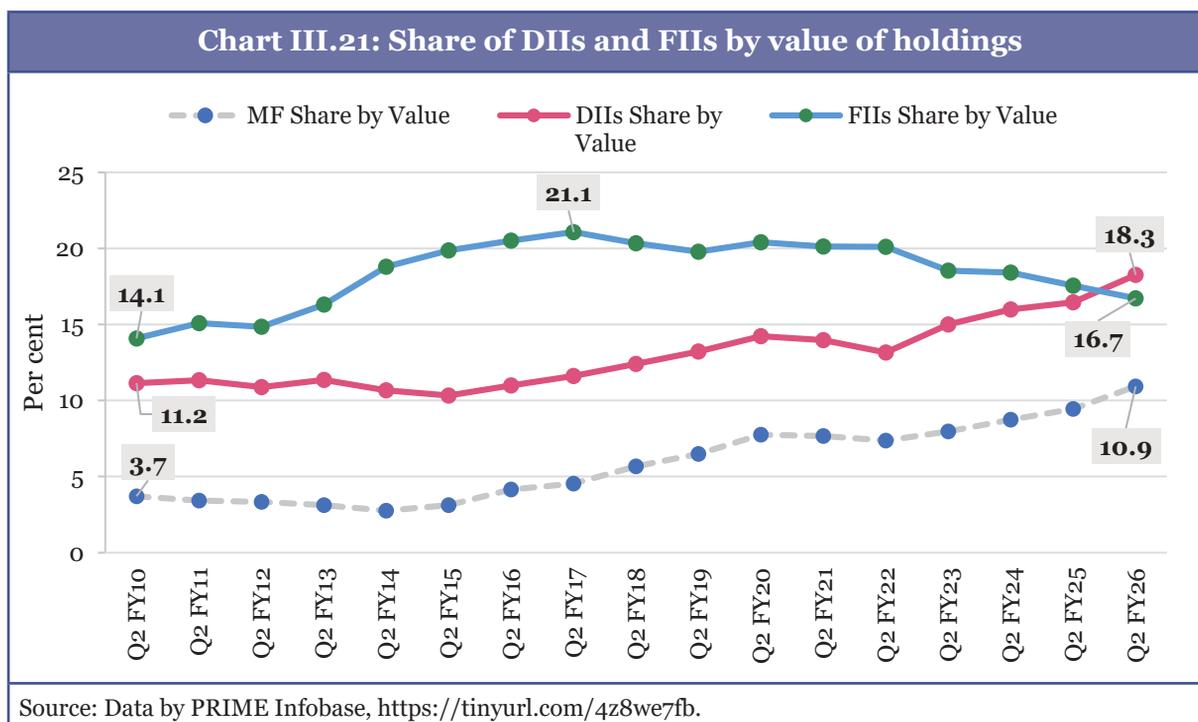
3.90 In the midst of volatile foreign capital flows, domestic institutional investors (DIIs), particularly mutual funds and insurance companies, have counterbalanced the volatility of foreign investment outflows and have provided much-needed support to the markets. With continued buying, as of 30 September 2025, DII ownership within NSE-listed equities stands at 18.7 per cent.<sup>75</sup>



<sup>74</sup> NSDL: FPI AUC category-wise data, <https://tinyurl.com/mpmtv65v>.

<sup>75</sup> National Stock Exchange of India Limited. (2025, September). India ownership tracker: Q2 FY26 (Vol. 7, Issue 2): Who owns India Inc.? DMFs extend record run, FPIs at 15-year lows (Report), <https://tinyurl.com/mt9t6586>.

3.91 The DIIs have consistently maintained their position as net buyers in Indian equities, effectively countering FPI selling and reinforcing the strength of the domestic market. The increasing significance of DIIs as large net buyers is further reflected in their rising shareholdings. The share of DIIs<sup>76</sup> (by value of holdings) surpassed that of foreign institutional investors (FII)<sup>77</sup> for the first time in Q4 FY25 and has now reached an all-time high in Q2 FY26. In Q2 FY26, the share of DIIs (by value of holdings) stands at 18.3 per cent while that of the FIIs stands at 16.7 per cent, a 13-year low.<sup>78</sup>



3.92 Domestic MFs have significantly contributed to the trend of the share of DIIs surpassing that of FIIs. In Q2 FY26, the share of MFs (by value of holdings) reached an all-time high of 10.9 per cent. Therefore, even though FIIs remain important participants in the Indian capital market, DIIs, along with retail investors and high-net-worth individuals, have been playing a strong counterbalancing role to the decisions made by FIIs regarding market participation. The combined share (by value of holdings) of DIIs, retail investors, and high-net-worth individuals reached an all-time high of 27.8 per cent in Q2 FY26.

<sup>76</sup> Domestic Institutional Investors include domestic MFs, Insurance Companies, Banks, Financial Institutions, Pension Funds, Non-Banking Financial Companies (NBFCs), Domestic Sovereign Wealth Funds (SWFs), Asset Reconstruction Companies (ARCs), etc.

<sup>77</sup> Foreign Institutional Investors include Foreign Portfolio Investors (FPIs), Foreign Direct Investment (FDI), Foreign SWFs and ownership through Depository Receipts (DRs) held by custodians.

<sup>78</sup> Data from PRIME Infobase is available at <https://tinyurl.com/4z8we7fb>.

## GIFT City

3.93 The present era is characterised by intensified competition to attract global capital, with both developed as well as developing countries vying for productive capital to fuel their growth. While financial centres were an innovation of the era of globalisation, their relevance is exalted in the presence of intensified competition to attract global capital. In this context, the achievements and progress made by India's maiden International Financial Service Centre (IFSC) at GIFT City (Gandhinagar) provides a glimpse into India's advancements toward creating an enabling ecosystem for attracting and channelling global capital.

3.94 The International Financial Services Centres Authority (IFSCA), established in April 2020 under the IFSCA Act 2019, serves as GIFT City's unified regulator with a mandate to develop and regulate financial products, services, and institutions within the IFSCs. By consolidating regulatory powers previously dispersed across RBI, SEBI, Insurance Regulatory Development Authority of India (IRDAI), and Pension Fund Regulatory and Development Authority (PFRDA) for IFSC operations, IFSCA enables a cohesive regulatory approach aligned with international standards.

3.95 Prior to GIFT City's establishment, many Indian companies raised funds or managed offshore investments through jurisdictions such as Singapore, Mauritius, and the Cayman Islands, largely due to more favourable tax and regulatory frameworks. The IFSC architecture aims to bring back financial services transactions currently conducted outside India by overseas financial institutions and overseas branches of Indian financial institutions to Indian shores, thereby attracting multinational banks, investment funds, and technology firms to generate high-value jobs, draw global capital, and reduce financial outflows to offshore centres.

3.96 GIFT City has shown a strong growth momentum, with over 1,034 domestic and international entities registered across various categories as of 30 November 2025.<sup>79</sup> Within a year, GIFT City has moved up nine places in the Global Financial Centres Index (GFCI), reaching a rank of 43 out of 120 financial centres. Within the fintech-specific ranking, GIFT City improved by ten places, reflecting progress made through a dedicated regulatory framework for fintechs, academic partnerships and innovation centres. Table III.2 presents the major financial operations in GIFT City and their achievements to date.

<sup>79</sup> Including in-principle/ provisional registrations

**Table III.2: Progress card of the major financial operations performed by GIFT City**

Financial operations in GIFT City	Achievements
 Banking and credit operations	38 IFSC Banking Units with USD 100+ billion assets; USD 142.98 billion cumulative transactions. <sup>80</sup>
 Capital markets and debt	Monthly turnover USD 88+ billion; cumulative derivatives trades USD 1,351 billion; debt listings USD 66+ billion, including USD 15+ billion ESG securities.
 Specialised financial services	33 aircraft lessors (303 aviation assets) and 34 ship lessors (28 vessels) address India's leased fleet dependency.
 Bullion trading	The India International Bullion Exchange has been operational since July 2022, with 185 qualified jewellers and a vault capacity of 151 tonnes of gold and 930 tonnes of silver.
 Fund management and Insurance	194 Fund Management Entities managing 310 schemes; USD 26.30 billion commitments; 52 insurance entities registered.

3.97 Recognising that human capital underpins financial sector growth, two Australian universities have established operational International Branch Campuses in GIFT IFSC, offering master's programs in business analytics, cybersecurity, fintech, and computing. Two UK universities have received in-principle approvals to establish similar campuses.

3.98 Two developments in 2025 underscore GIFT City's growing regional and operational significance. In June, Sri Lanka's DFCC Bank listed Sri Lankan Rupee 2.5 billion in green bonds on the NSE International Exchange—the first listing by a foreign corporation on a GIFT IFSC exchange, signalling the centre's emergence as a regional capital-raising hub. The Foreign Currency Settlement System (FCSS), launched in October 2025, enables the local settlement of foreign-currency transactions between IFSC banking units without routing them through overseas correspondent banks. The FCSS operates on a real-time or near real-time basis, substantially reducing settlement times while enhancing transaction security and cost-effectiveness. This infrastructure positions GIFT City for future innovation in cross-border payments.

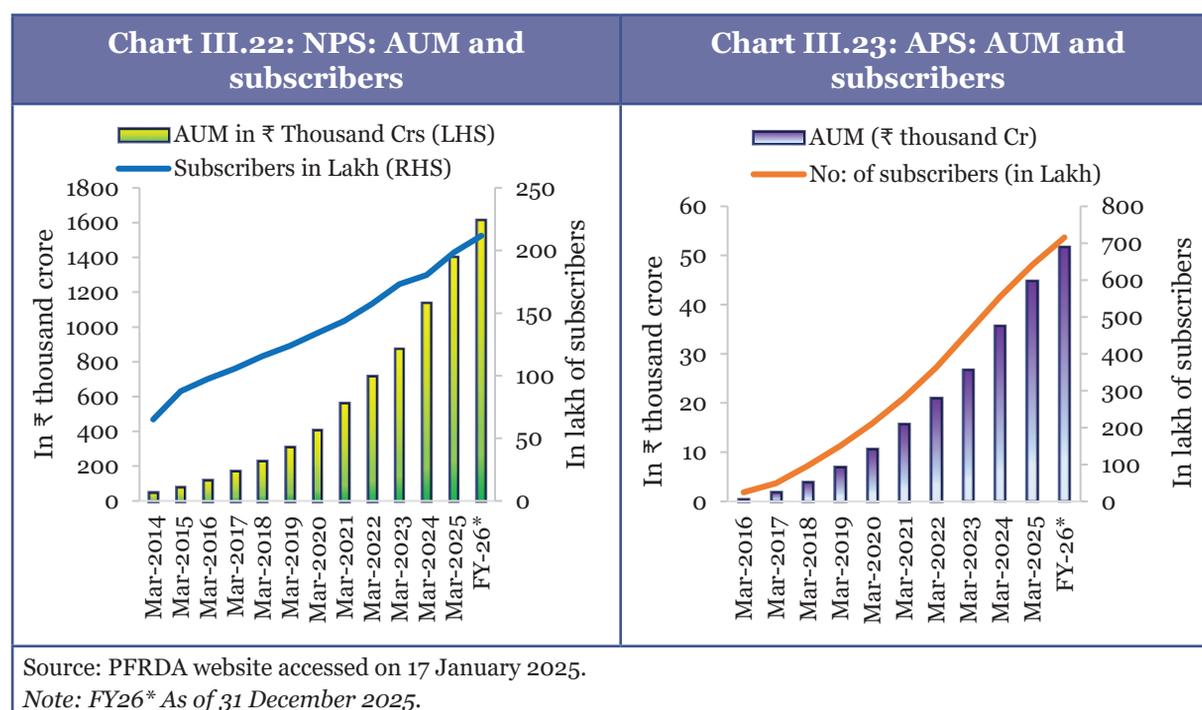
<sup>80</sup> PIB Press release Smart Finance, Smart Future: GIFT City, dated 28 November 2025, <https://tinyurl.com/bdew863h>.

## Performance of the pensions sector

3.99 Between 2021 and 2036, the proportion of the old-age population (60+) in the total population is expected to increase from 10.1 per cent to 14.9 per cent. At the same time, the proportion of the working-age population (15-59) is projected to increase marginally from 64.2 per cent to 64.9 per cent during the same period.<sup>81</sup> As today's workers approach retirement, it is essential that they be covered by a stable and secure pension scheme. In this context, the PFRDA has laid the groundwork for a vibrant pension system, offering a range of options for its users and covering a broad population bracket.

3.100 India's pension landscape features a multi-tiered system dominated by the market-linked National Pension System (NPS), the government-backed Unified Pension Scheme (UPS) launched in 2025, and other schemes like the Employees' Provident Fund (EPF) and Atal Pension Yojana (APY) for broader coverage.

3.101 The NPS architecture caters to a wide range of demographics: central and state government employees, private sector workers, corporate entities, minors under the NPS Vatsalya and individuals from the unorganised sector. As of 31 December 2025, there were 211.7 lakh subscribers to NPS and managed assets worth ₹16.1 crore.<sup>82</sup> Over the past decade (FY15 to FY25), NPS subscribers have grown at a CAGR of 9.5 per cent, and the assets under management (AUM) have rapidly increased at a CAGR of 37.3 per cent.



81 Table 17: National Commission on Population, Ministry of Health & Family Welfare, Government of India. (2020). Population projections for India and states 2011–2036: Report of the Technical Group on Population Projections (July 2020). Ministry of Health & Family Welfare, Government of India, <https://tinyurl.com/msbyswy>.

82 NPS Trust website accessed on 17 January 2025, <https://tinyurl.com/bdtzkukv>.

3.102 The APY, which envisions a social security system for all citizens, is open to all Indian citizens who hold a savings bank account. Since its inception in 2016, APY subscriptions have grown at a robust CAGR of 43.7 per cent, and AUM have shown exemplary growth at a CAGR of 64.5 per cent.

3.103 The government introduced the UPS vide notification dated 24 January 2025, as an option under the NPS for Central Government employees. It aims to blend the best features of previous systems by guaranteeing a minimum pension and allowing investment-based growth, providing stability and flexibility for retirees.

3.104 NPS Vatsalya is a contribution-based saving-cum-pension scheme for minors, which aims not only to secure the future of its young subscribers but also emphasises the importance of nurturing a culture of savings from an early age.

3.105 PFRDA has introduced several pensions and retirement schemes specifically targeting platform (gig) workers and the agricultural (agribusiness) sector, aiming to widen the social security net and ensure financial security among India's informal workforce. The NPS e-Shramik (Platform Service Partner) Model was launched on 29 October 2025. This model is designed for platform workers and seeks to integrate them into mainstream retirement savings through the NPS.<sup>83</sup>

3.106 PFRDA is partnering with Farmer-Producer Organisations (FPOs) and MSMEs to bring pension coverage to more workers in the agriculture sector, including farmers, FPO members, and participants of self-help groups. The focus is on enrolling agriculture workers under the NPS and the APY, both of which provide flexible, long-term retirement savings options, including a guaranteed pension under APY.

3.107 India's pension system has expanded steadily, yet overall coverage remains modest relative to the size of the workforce.<sup>84</sup> Additionally, persistent awareness gaps prevail, with low-income and rural households maintaining limited exposure to long-term retirement products.<sup>85</sup> Recent efforts, such as simplified onboarding, NPS Lite variants, APY outreach campaigns, and targeted products for minors, gig workers, and farmer groups, demonstrate the progress being made in closing these long-standing coverage gaps.

---

83 PFRDA. (2025, October 29). Inclusion of Platform Service Partner under the National Pension System (NPS) – “NPS e-shramik (Platform Service Partner) Model” (Circular No. PFRDA/2025/19/PDES/02), <https://tinyurl.com/5efwx6fp>.

84 Centre for Policy Research. (2022, January 17). The Pension Fund Regulatory & Development Authority, <https://tinyurl.com/ysta5v5w>.

85 Mohanty, D. (2025, January 17). Progress and prospects of pension in India (Speech). 17th Mint BFSI Summit & Awards, Mumbai, India. Pension Fund Regulatory and Development Authority, <https://tinyurl.com/3xhhjsse>.

3.108 The predominance of informality continues to be the central constraint on achieving broad-based pension inclusion. Moreover, households with irregular incomes face difficulty committing to locked-in, long-horizon savings, even when contributions are modest. Accessibility is improving with digital KYC, e-NPS, and integrations with payment platforms, but flexible contribution structures and intuitive product design remain essential for workers with volatile cash flows. The inclusion of pension systems through platforms and apps – now seen in the UK, Singapore, and Europe – demonstrates a viable route for increasing contribution compliance when pension deductions are embedded into existing digital work interfaces.<sup>86</sup>

3.109 Adequacy and sustainability are becoming key priorities for the pension system as it expands over time. Global benchmarks, such as the Mercer CFA Global Pension Index, consistently rank India lower in terms of adequacy and system maturity, reflecting relatively low replacement rates and modest pension assets (around 17 per cent of GDP) compared to OECD peers (at least 80 per cent).<sup>87</sup> Pension assets in India make up around 15-20 per cent of GDP, significantly less than the 60-100 per cent range seen in more advanced pension markets.

3.110 An area for further progress is regulatory coherence. Studies highlight the need for better alignment between EPFO, PFRDA, and state-level pension bodies to reduce fragmentation, enhance portability, and streamline governance.<sup>88</sup> Strengthening actuarial evaluation frameworks, diversifying long-term investment portfolios, and deepening data-sharing mechanisms across institutions will be essential as longevity increases and old-age dependency continues its structural rise.

3.111 The way forward for India's pension ecosystem lies in a calibrated expansion of both contributory and non-contributory schemes. At the contributory end, simplifying enrolment through Aadhaar-based authentication, enabling frictionless micro-contributions via digital payments, and synchronising pension outreach with broader financial inclusion drives can help deepen penetration. Engagement with state governments, cooperatives, farmer networks, and gig-platform companies can ensure last-mile reach.

3.112 The introduction of UPS and NPS Vatsalya demonstrates adaptive policymaking that responds to evolving demographic and labour-market realities while maintaining

86 Pension Fund Regulatory and Development Authority. (2025, April 3–4). International research conference on pension (IRCP 2025): Records of discussion—IRCP-2025 (Conference report), <https://tinyurl.com/2rvauxx2>.

87 Pension Fund Regulatory and Development Authority. (2025). International Research Conference on Pension (IRCP 2025) [Conference proceedings]. Pension Fund Regulatory and Development Authority, <https://tinyurl.com/ydnmdvm7>.

88 Lodha, N., & Mukherjee, D. (2024, October 24). One Nation, One Pension System. Vidhi Centre for Legal Policy, <https://tinyurl.com/ya3rc467>.

long-term fiscal prudence. Continued innovation in service delivery, data integration and consumer guidance will be crucial for the next phase. Global experiences of developed pension systems underscore the value of lifecycle planning tools, personalised dashboards, and automated advisory nudges, all of which can be integrated into India's maturing digital public infrastructure.<sup>89</sup>

3.113 Expanding interoperability across NPS, APY and other schemes will support seamless portability as workers shift sectors or migrate. Strengthening actuarial capabilities, improving risk-modelling frameworks, and promoting long-duration investment channels can enhance both resilience and returns. With sustained institutional strengthening, India is well-positioned to develop a pension system that is inclusive, future-ready, and anchored in global best practices.

### Performance of the Insurance Sector

3.114 The Indian insurance sector is undergoing a significant transformation, driven by the vision of 'Insurance for All by 2047', where every citizen possesses appropriate life, health and property insurance cover. In alignment with this objective, the IRDAI has been implementing a series of regulatory reforms to foster growth and empower policyholders.

3.115 This sector has continued to widen its reach, reinforcing its role as a key mechanism for risk transfer and a vital channel for long-term savings mobilisation across households, enterprises, and the wider economy. With AUM reaching ₹74.4 lakh crore in FY25, the sector's financial depth has strengthened. Total premium income rose to ₹11.9 lakh crore in FY25 from ₹8.3 lakh crore in FY21. The life insurance segment dominates the landscape, holding 91 per cent of the total AUM and contributing approximately 75 per cent of the premium income. Structural shifts are evident in the 'non-life' insurance segment, where health insurance, accounting for 41 per cent of the gross domestic premium, has overtaken motor insurance as the leading business line. All 26 life insurers, 26 non-life insurers, seven health insurers and two specialised insurers are active and supported by a network of over 83 lakh distributors.

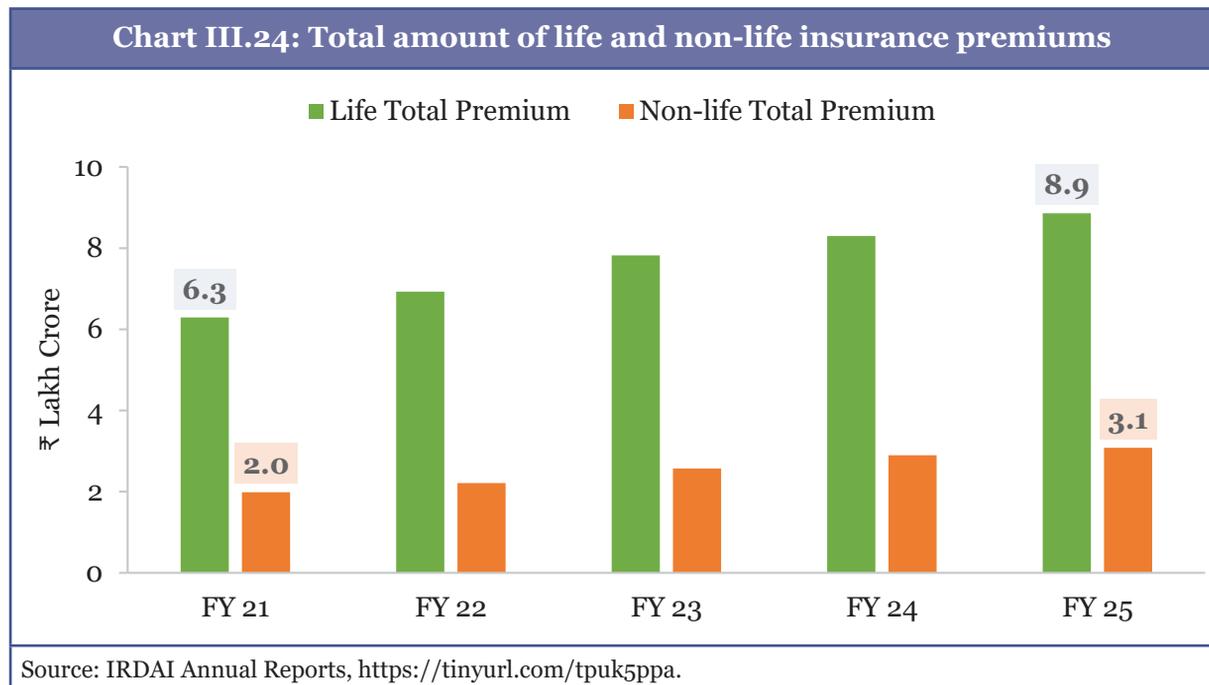
3.116 The sector demonstrated resilience in managing rising claims and liquidity demands. Life insurers paid benefits totalling ₹6.3 lakh crore in FY25. A compositional shift was observed in payouts, with surrender and withdrawal benefits rising to levels comparable to maturity payments. In the 'non-life' sector, net incurred claims escalated by over 70 per cent since FY21 to ₹1.9 lakh crore in FY25, primarily driven by the Health and Motor segments. To sustain this operational growth and absorb underwriting

<sup>89</sup> Organisation for Economic Co-operation and Development. (2024). OECD Pensions Outlook 2024: Improving asset-backed pensions for better retirement outcomes and more resilient pension systems (OECD Publishing), <https://tinyurl.com/yea29yd6>.

volatility, the equity share capital of the ‘non-life’ sector increased to over ₹43,000 crore, exceeding the Life sector’s base of ₹39,700 crore. This continuous capital infusion has ensured that both segments maintain healthy solvency margins.

3.117 Accessibility infrastructure has been bolstered through a strategic mix of physical presence of insurers and intermediary expansion. The total number of insurers’ offices stood at 22,076 as of March 2025. Complementing this physical reach, the distribution network—comprising agents, point of sales persons, and institutional partners—grew significantly from approximately 48 lakh in FY21 to nearly 83 lakh in FY25. This expansion is vital for facilitating delivery of insurance services various segments and specially in reaching the rural and socio-economically weaker sections of society.

3.118 The non-life insurance segment has recorded strong growth in recent years, broadly keeping pace with nominal GDP growth. This expansion has been driven by rising demand for health insurance, mandatory motor insurance requirements, and increasing asset ownership. Standalone health insurers have emerged as one of the fastest-growing segments, highlighting the growing need for healthcare financing solutions.



3.119 Despite the progress in Life and Non-life segments, insurance penetration remains low, resulting in a significant protection gap. Rapid escalation in healthcare costs, rising climate-related risks, and an increase in cyber-risk incidents have emerged as key challenges. A large proportion of households and MSMEs continue to remain uninsured, with insurance adoption uneven across regions and income groups. Closing

this protection gap is critical to strengthening household financial security and reducing vulnerability to financial shocks. Achieving this will require the insurance sector to grow at a substantially faster pace than nominal GDP.

3.120 The exemption in GST on life insurance and individual health insurance policies, introduced from September 2025, has provided substantial relief to policyholders and made insurance services more affordable in these two critical lines. Backed by such tailwinds, the growth is expected to pick up and add new insurance policyholders.

3.121 The enactment of ‘Sabka Bima, Sabki Suraksha Act, 2025’ will usher in the much-awaited reforms in the insurance sector. An increase in the FDI limit to 100 per cent, accompanied by other amendments, paves the way for ease of doing business, the entry of more players, and enables the much-needed expansion of the sector to address the protection gap for individuals and businesses. Increased penetration and a fast-growing insurance sector also imply the availability of long-term investable funds that support infrastructure growth. Box III.10 provides the key provisions of the Act.

#### Box III.10 Sabka Bima Sabki Raskha (Amendment of Insurance Laws)

The Sabka Bima Sabki Raksha (Amendment of Insurance Laws) Act, 2025 has amended various provisions of the Insurance Act, 1938, the Life Insurance Corporation Act, 1956, and Insurance Regulatory and Development Authority Act, 1999, with a view to enhance citizens protection, deepen insurance penetration, accelerate growth and development of the insurance sector and to enhance the ease of doing business. The Act was notified on 21 December 2025. Important provisions are as below:

- **Increased FDI limit:** The amendment has raised the FDI limit in Indian insurance companies from 74 per cent to 100 per cent. This will help in attracting stable and sustainable investment, facilitate technology transfer, enhance insurance penetration and social protection
- **Promote Ease of Doing Business:** To ensure uninterrupted service and support to policyholders and to promote ease of doing business, one-time registration of insurance intermediaries has been provided. Further, the limit for seeking IRDAI approval for transfer of shares of paid-up equity capital is has been raised from the current 1 per cent to 5 per cent for insurance companies. The requirement of Net Owned Funds for foreign reinsurers has been reduced from ₹5,000 crores to ₹1,000 crores to facilitate the entry of more reinsurers, thereby helping to build greater reinsurance capacities in the country.
- **Creation of Insurance Awareness:** The amendment provides for the creation of a Policyholders’ Education and Protection Fund, to increase citizens’ awareness towards risk protection and promote education for policyholders

- **Improved Policyholders' Protection:** For greater Policyholders' protection, IRDAI has been granted the power of disgorgement of wrongful gains made by an insurer or intermediary. The maximum penalty limit for insurers who default in complying with or acting in contravention of the Insurance Act or the IRDAI Act has been increased from ₹1 Crore to ₹10 Crore. Insurance intermediaries have also been included under this provision. This would act as a deterrent and encourage legal and regulatory compliance.
- **Alignment with Digital Personal Data Protection Act 2023:** The amendment creates a legal anchor for effective use of digital public infrastructure in the insurance sector to ensure that policyholders' information is duly secured and protected.

Furthermore, the Indian Insurance Companies (Foreign Investment) Amendment Rules, 2025, were also notified on 30 December 2025 to facilitate ease of doing business by rationalising the conditions for Indian insurance companies and insurance intermediaries.

3.122 For creating a universal social security system for all Indians, especially the under-privileged, two social security schemes in the insurance sector are in place, viz, Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) and Pradhan Mantri Suraksha Bima Yojana (PMSBY), on a pan-India basis since May 2015. The schemes are being offered by public sector insurers and other insurers that are offering the product on similar terms, with the necessary approvals and tie-ups with banks and post offices for this purpose. As of 7 January 2025, cumulative enrolment under PMSBY and PMJJBY is 56.15 crore and 26.32 crore, respectively. Further, 1.73 lakh and 10.24 lakh claims have been paid under PMSBY and PMJJBY, respectively.

### **Structural Challenges: High operating costs**

3.123 While the sector has continued to grow at a robust pace, operational cost dynamics have continued to change within the insurance industry. Escalating acquisition and administrative costs have resulted in increased operating expenses for insurers across both life and non-life insurance segments.

3.124 Despite the push for digital transformation, customer acquisition continues to depend heavily on expensive intermediary networks. Consequently, instead of technology leading to cost rationalisation, costs have steadily increased, with a significant portion of premiums being consumed by distribution overheads.

3.125 The most visible implication of the high-cost regime is the widening divergence between insurance coverage depth and breadth. While insurance density has risen steadily to USD 97 in FY25, reflecting higher spending by households already integrated into the financial system, insurance penetration has stagnated and declined to 3.7 per cent. This paradox indicates that while the sector is successful in 'deepening' revenue

from existing customers, high distribution costs are preventing a ‘widening’ of the risk pool. The rigid cost structure means premium growth fails to keep pace with nominal GDP, eroding the sector’s relative economic size. Lowering overall costs and distribution outgoes is essential to improve affordability, enabling the industry to tap into the ‘missing middle’ and reverse the decline in penetration.

3.126 The escalating cost of acquisition is not merely an operational friction; it acts as a structural constraint on the sector’s evolution, creating distortions that limit inclusion, erode consumer value, and threaten long-term stability. Rationalising this cost structure is the critical lever required to transition the industry from a ‘high-cost, low-penetration’ equilibrium to a sustainable growth path.

3.127 The high-cost model poses a risk to the core financial strength of insurers. Private life insurers, despite robust topline growth, have seen their net profit stagnate, as margins are compressed by escalating acquisition expenses. Similarly, the non-life sector faces high combined ratios, forcing a heavy reliance on investment income to subsidise operations, a strategy that exposes the sector’s bottom line to capital market volatility. Rationalising acquisition costs would allow insurers to price risk more accurately and increase value to customers, making products and prices more affordable.

3.128 The insurance sector stands at a pivotal juncture. While it has matured into one of the economy’s deepest institutional pools of long-term capital, it remains constrained by a ‘low-penetration, high-cost’ equilibrium driven by a high-cost distribution model that has inflated the cost of protection, structurally limiting the sector’s reach despite its robust solvency and balance sheet strength. The path forward necessitates decisive shifts. Insurers must prioritise the digitisation of distribution to rationalise acquisition costs and restore ‘value for money’ to the policyholder. If the industry can successfully dismantle these cost inefficiencies, it will not only resolve the penetration-density paradox but also transform from a constrained aggregator of savings into a truly inclusive and resilient pillar of the economy.

## CONCLUSION

3.129 In an era characterised by heightened global uncertainty, geopolitical flux, and rapid technological transformation, the quality of financial sector regulation has emerged as a critical determinant of economic resilience and sustained growth. India’s financial regulatory architecture demonstrates a clear recognition of this imperative, as evidenced by RBI’s landmark framework for the formulation of regulations issued in May 2025. This framework institutionalises a transparent, consultative, and impact-driven

approach to regulation-making, one that incorporates periodic reviews, stakeholder engagement through the Advisory Group on Regulation, and a dedicated Regulatory Review Cell tasked with systematically examining each regulation at least once every five to seven years. Such measures signal a paradigm shift from reactive regulation to proactive, anticipatory governance that can respond dynamically to evolving market conditions and global best practices. SEBI has demonstrated a parallel commitment to regulatory modernisation and investor protection.

3.130 India's regulatory bodies for insurance and pension - IRDAI and PFRDA - have similarly advanced reforms to deepen financial inclusion and extend protection to underserved segments. IRDAI has transitioned towards a principle-based framework that consolidates regulations, reduces compliance burdens, and provides insurers with greater flexibility to innovate. Meanwhile, the Sabka Bima Sabki Raskha (Amendment of Insurance Laws) represents its commitment to digitising the insurance ecosystem and democratising coverage. PFRDA, meanwhile, has focused on widening the social security net to encompass India's vast informal workforce - the NPS e-Shramik model, launched in October 2025, integrates platform and gig workers into mainstream retirement savings, while partnerships with FPOs and MSMEs extend pension coverage to agricultural workers and self-help group participants through the NPS and APY.

3.131 The systemic rise in regulatory quality has received international validation through the Financial Sector Assessment Program (FSAP) conducted jointly by the IMF and World Bank in 2025.<sup>90,91</sup> Both reports noted an increasingly resilient, diversified, and inclusive financial system, with total financial sector assets at nearly 187 per cent of GDP in CY 2024 and capital markets expanding from 144 per cent of GDP in CY 2017 to 175 per cent in CY 2024. The assessments found that banks and NBFCs possess adequate capital buffers even under severe stress scenarios.

3.132 In today's era, India's financial sector regulators must walk the tightrope to balance growth with stability. They must strike a balance between openness to global capital flows and the need to insulate the domestic economy from volatile external shocks. Moreover, given India's heterogeneous financial landscape, where sophisticated metropolitan markets coexist alongside underserved rural segments, regulators must exercise differentiated supervision: a shorter leash for emerging or fragile segments prone to excessive risk-taking and greater latitude for mature markets. In this context, so far, India's financial sector regulators have managed the balancing act deftly. Box III.11 discusses how the regulatory system must evolve towards proportionality, contestability, and risk-appropriate supervision without compromising stability.

90 World Bank. (2025). India financial sector assessment: Financial Sector Assessment Program (FSAP) update (June 2025), <https://tinyurl.com/y4zd79a>.

91 International Monetary Fund. (2025). India: Financial Sector Assessment Program—Financial System Stability Assessment (IMF Country Report No. 25/55), <https://tinyurl.com/5h6ecbn6>.

### Box III.11: Finance for growth: paving the way for Viksit Bharat

India's aspiration to become a Viksit Bharat by mid-century demands a fundamental rethinking of finance, not merely as funding, but as the architecture of economic transformation. Finance, in its broader institutional and behavioural sense, governs how effectively capital is mobilised, allocated, and sustained across the economy. It is the central enabler. When finance builds trust, fosters competition, and enables innovation, it becomes the catalyst of development.

A nation does not develop by spending more but by expanding its productive base—enabling firms to invest and scale, households to earn and save securely, and markets to channel capital efficiently. This requires an enabling environment: rational taxation that supports enterprise, regulators that foster competition, financial markets that deepen and diversify, and administrative systems that operate transparently and promptly. Finance for Viksit Bharat is therefore about shaping conditions that generate and deploy resources efficiently.

#### Fostering certainty and predictability

This requires tax systems that are simpler and service-oriented, dispute resolution that is time-bound and fair, and the decriminalisation of technical offences. Regulators must promote competition and innovation while safeguarding stability. Credit and capital supply must move beyond bank dominance through deeper markets and modern financial infrastructure. Administrative processes should be centred on timeliness, proportionality, and citizen service.

#### Recasting financial regulation

Finance influences growth most visibly through regulation. Historically, India has placed a premium on banking system stability. As a result, long-term financing channels. Banks remain dominant, despite not being adequately equipped to finance infrastructure, energy transition, and large manufacturing projects with long horizons. India's development aspirations require a diversified ecosystem where well-managed banks compete alongside NBFCs, fintechs, and market-based lenders. Diversification distributes risk and builds resilience, lessening vulnerability to shocks.

Diversified financial ecosystem calls for regulatory coordination, as, currently, India's financial system is supervised by domain-specific regulators. Financial innovation increasingly blurs these boundaries. Banks distribute insurance and mutual funds; NBFCs perform functions similar to those of banks; fintechs intermediate credit and payments. To avoid regulatory arbitrage, inconsistency, and enforcement blind spots, regulation should shift from entity-based to activity-based frameworks, focusing on the risk and function of transactions rather than institutional labels. When entities engage in similar activities, they should face proportionate regulatory oversight based on their risk exposure. This promotes equality of treatment, competition, and innovation while ensuring systemic stability. Finally, enhanced inter-agency coordination is crucial for effective oversight of increasingly complex and interconnected financial entities.

India's regulatory framework hitherto has rightly emphasised stability and systemic safety. The goal now must be to proportionality-calibrate regulation to risk and contestability, ensuring fair competition across entities and activities. The shift towards proportional, consultative, and accountable regulation is exemplified in the proposed Securities Markets Code, 2025 (Box III.6).

### **Deepening long-term finance**

To finance sustained growth, India must strengthen long-term capital markets. Corporate bond markets remain shallow and illiquid, dominated by top-rated issuers. Securitisation is limited, municipal bonds are underdeveloped, and pension and insurance funds remain conservative investors due to regulatory and cultural inertia. A coordinated agenda could address these barriers by:

- Rationalising tax treatment of debt instruments.
- Creating credit enhancement facilities for lower-rated issuers.
- Standardising securitisation structures and disclosures.
- Building municipal financial capacity and pooled bond mechanisms.
- Revising investment guidelines for long-term funds.
- Strengthening financial market infrastructure and insolvency systems.

Such reforms would supply the scale and maturity needed for infrastructure and climate financing while lowering the economy's cost of capital.

### **Building a balanced financial ecosystem**

The reforms taken together aim to shape a financial system that is stable yet competitive, diversified yet resilient, and innovation-friendly yet safe. Banks will remain central, but they must be seen as one part of a richer ecosystem that includes non-bank intermediaries and markets. Such a system reduces capital costs, expands financing options, facilitates structural transformation, and enhances the economy's adaptive capacity.

\*\*\*

*This page has been left blank*

## EXTERNAL SECTOR: PLAYING THE LONG GAME

*India's external sector has evolved amidst a global environment characterised by heightened trade policy uncertainty, geopolitical realignments, and a structural shift away from a hyper-globalisation phase. The reconfiguration of global trade and investment flows, increasingly influenced by considerations of national security, technological sovereignty, and strategic autonomy, has introduced both new constraints and opportunities for emerging economies. In this changing environment, India's external performance demonstrates resilience to global shocks and highlights the structural characteristics associated with a rapidly growing economy that is integrating more deeply into global markets.*

*On the trade front, India's total exports reached record levels of USD 825.3 billion in FY25 and USD 418.5 billion in H1 FY26, driven by strong growth in services exports and sustained momentum in non-petroleum, non-gems, and jewellery exports. The expansion of higher-value manufacturing exports, especially in electronics, pharmaceuticals, and electrical machinery, along with diversification of export destinations and import sources, has strengthened resilience amid rising protectionism and tariff uncertainties. The services trade surplus remains a key stabilising factor, consistently offsetting a large portion of the merchandise trade deficit, supported by strong growth in software, business services, and the expanding role of Global Capability Centres.*

*India's current account remains stable, buoyed by robust inflows from services exports and remittances. On the capital account, India has attracted significant gross investment inflows despite a subdued global environment for foreign direct investment (FDI) and volatile portfolio flows. Gross FDI inflows have remained resilient, supported by equity investments and greenfield projects, while portfolio flows have been volatile, reflecting global financial conditions. External buffers have further strengthened, with foreign exchange reserves providing comfortable import cover and robust protection against external liabilities. India's international investment position has steadily improved, and its external debt remains moderate, with a favourable maturity profile and high reserve coverage.*

### INTRODUCTION

4.1 The global economic landscape is undergoing a structural reordering, signalling the ebb of an era marked by seamless globalisation and trade liberalisation. A more

fragmented and cautious world is emerging, one where protectionist instincts are taking precedence over outreach for imports, supply chains are being recalibrated in response to geopolitical shifts, and the terms of engagement are shifting more toward bilateralism. While the full impact of recent trade policy shifts on global value chains (GVC) is still unfolding, the vulnerabilities are already visible. Accordingly, economies likely to be impacted by these sudden shifts are now turning inward, strategically seeking to fortify their domestic capacities and reduce overdependence on transnational value chains.

4.2 This pivot is not merely a cyclical adjustment in the aftermath of the COVID-19 pandemic-induced disruptions; it marks a secular shift in the way the global order is structured. The Trade Policy Uncertainty (TPU) Index and the Global Economic Policy Uncertainty (GEPU) Index peaked in April 2025, driven by three converging factors: the weakening of regional and multilateral trade agreements that had previously provided stability, countries' pursuit of sovereign interests through industrial policies, and intensifying competition for rare earth minerals. (UNCTAD, 2025).<sup>1</sup>

4.3 The global economy continues to adapt to a landscape reshaped by new policy measures. While some of the extreme effects of higher tariffs have been mitigated through subsequent agreements and adjustments, the overall environment remains volatile. The contours of global integration are being redrawn with national security, technological sovereignty, and the quest for resilience at the core.

4.4 India's external sector includes international trade, investment, capital flows, and external debt, and plays a vital role in shaping the country's economic performance and its integration with the global economy. All these developments have profound implications for a developing economy like India, as this altered milieu presents both constraints and transformative opportunities.

4.5 Against this backdrop, this chapter examines India's external sector performance within the prevailing global environment. Section I presents the emerging global trade dynamics serving as the background for further commentary in the chapter. Section II examines trends in India's trade performance across both the merchandise and services sectors. This section particularly emphasises the performance of the Production-Linked Incentive (PLI) sectors and the diversification of the country's export destinations. Section III presents India's Balance of Payments (BoP) situation, highlighting current and capital account trends, foreign exchange reserves, exchange rate movements, and India's external debt position. The last section concludes the chapter with an outlook for India's external sector, considering the evolving global and domestic economic landscape.

## GLOBAL TRADE DYNAMICS

4.6 The current global order faces three concurrent challenges: trade policy uncertainty driven by rising protectionism and retaliatory tariffs, strategic decoupling amongst

---

1 UNCTAD. (2025). Global Trade Update, September 2025, <https://tinyurl.com/42pvb8jn>.

major economies and the migration of national security tools into the domain of trade policy. This reorientation is evident across critical sectors. Semiconductor supply chains are being restructured to ensure technological autonomy and independence. Perceptions of geopolitical risk drive the diversification of critical minerals, telecom infrastructure, and pharmaceutical inputs. The use of investment screening regimes to protect sensitive technologies and restrictions on dual-use technologies exemplify this shift.

4.7 Parallel to trade uncertainty is the phenomenon of geopolitical realignment. The Russia-Ukraine conflict, the reconfiguration of energy trade routes and the expansion of BRICS exemplify this realignment. Furthermore, the emergence of ‘minilateral’ platforms, such as the Quadrilateral Security Dialogue and the Indo-Pacific Economic Framework for Prosperity, along with new connectivity corridors, including the India-Middle East-Europe Corridor, suggests that the dynamics of global relations are shifting. Supply chains are increasingly evaluated not merely in terms of cost efficiency but based on resilience and strategic autonomy. These shifts indicate the transition from unfettered integration to ‘geostrategic globalisation’, a world where countries remain interconnected but exercise greater caution regarding whom they trade with, how they source inputs, and which partners they depend upon.<sup>2</sup>

4.8 Goeconomic factors are now critical determinants in shaping key bilateral trade patterns. These factors not only exert a substantial influence on trade relations among major economies but also affect the nature of their relationships with other economies.<sup>3</sup> As shown in Chart IV.1, according to data from UNCTAD, friendshoring trends (trade growth between politically close countries) have consistently remained above the average levels seen in calendar year (CY) 2021. Notably, there has been a resurgence in friendshoring in CY 2025, following a slight decline observed in CY 2024. Nearshoring remains below its CY 2021 average; however, it improved in Q3 CY 2025, reflecting a slight increase in trade growth among geographically proximate countries.<sup>4,5</sup> In parallel, trade concentration increased in CY 2025 after declining continuously in

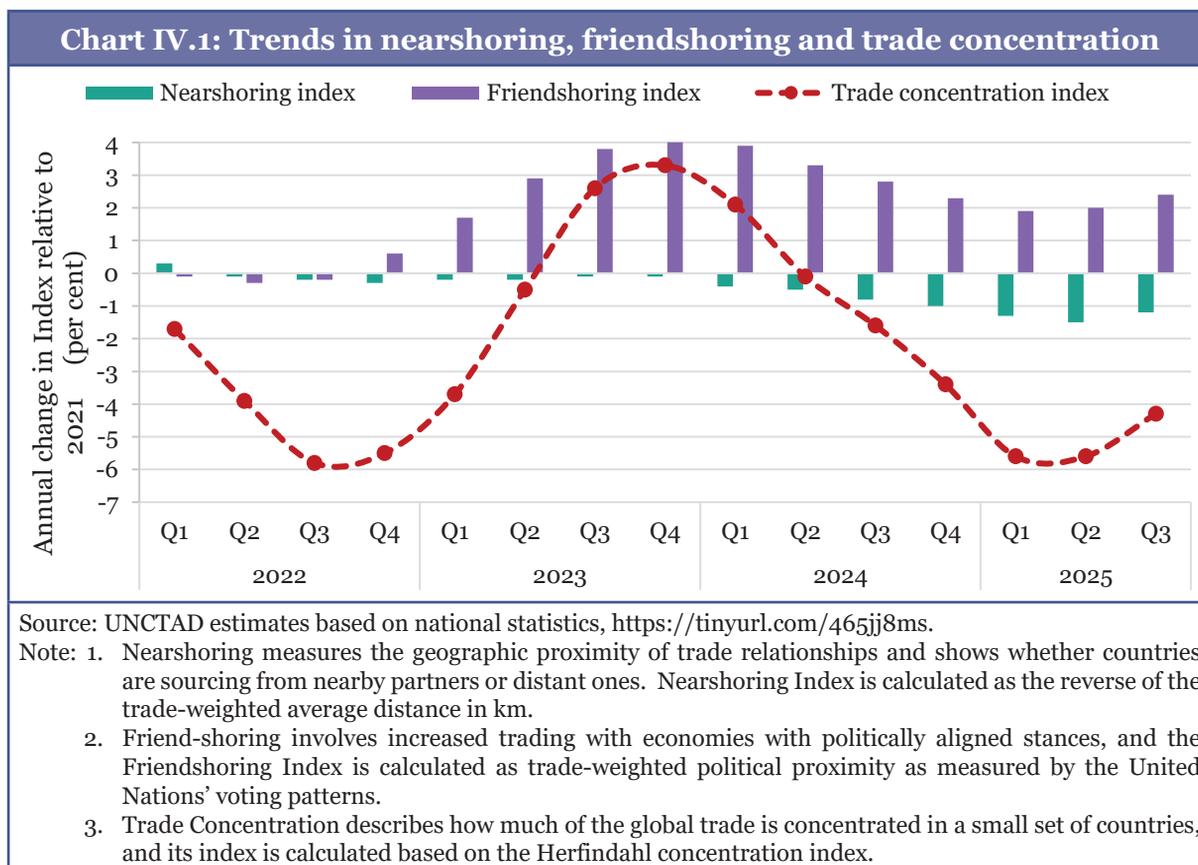
2 Schindler, S., & Rolf, S. (2025). Geostrategic globalization: US–China rivalry, corporate strategy, and the new global economy. *Globalizations*, 22(6), 897-914, <https://doi.org/10.1080/14747731.2024.2434306>.

3 UNCTAD. (2025). *Global Trade Update*, July 2025, <https://tinyurl.com/4waa26ve>.

4 Friend-shoring involves increased trading with economies with politically aligned stances, and the Friendshoring Index is calculated as trade-weighted political proximity as measured by the United Nations’ voting patterns. The political closeness between an importer and its suppliers is calculated based on foreign policy similarity. Foreign policy similarity data is obtained from the Foreign Policy Similarity FPSIM dataset (Häge, 2017), which uses alliance ties (Häge, 2011) and United Nations General Assembly voting patterns (Voeten, 2013). Foreign policy similarity is measured as the average similarity in the voting record of each country pair, corrected for the fact that non-alliance ties are more frequent than alliance ties. An increase in the average political closeness of trade indicates a shift in the importer’s import structure towards countries that share similar global views, which is interpreted as a trend towards friend-shoring: <https://tinyurl.com/85yf6ee2>.

5 Nearshoring measures the geographic proximity of trade relationships and shows whether countries are sourcing from nearby partners or distant ones. Nearshoring Index is calculated as the reverse of the trade-weighted average distance in km. The average geographical distance of the imports of a node sourcing from different suppliers is computed using the bilateral geodesic distance between the node and each of its trading partners, weighted by the value of bilateral trade. A decrease in the average geodesic distance would denote a nearshoring trend: <https://tinyurl.com/85yf6ee2>.

CY 2024, indicating accelerated trade growth among the largest economies.<sup>6,7</sup> Taken together, these trends underscore that a more comprehensive understanding of trade must therefore incorporate the interdependence of economics, security, technology, and politics, an intersection that defines the contemporary global order.



## Global trade performance in 2025

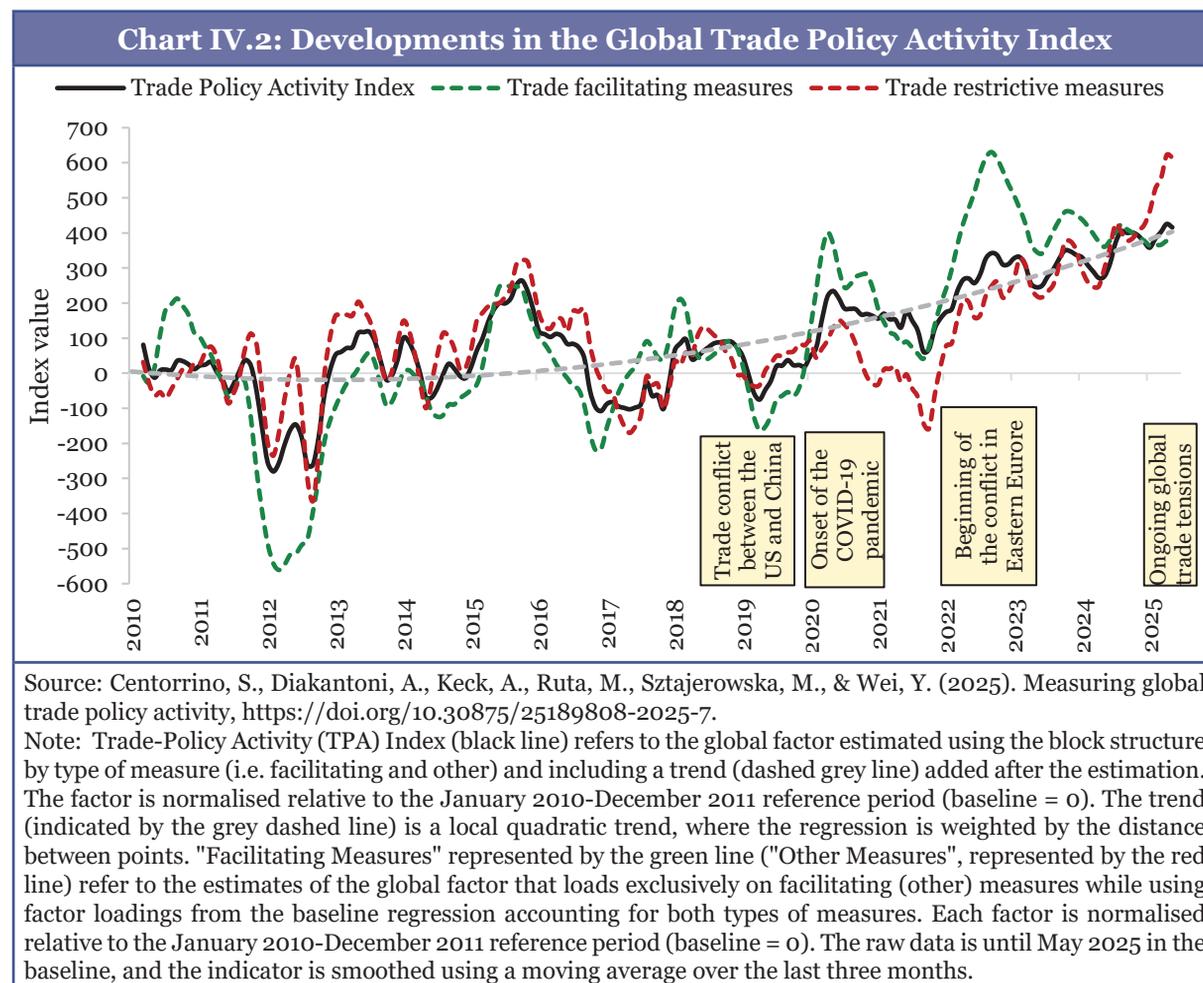
4.9 Since CY 2020, there has been a growing tendency to use trade policy for broader objectives such as environmental sustainability, industrial policy and national security. This trend is reflected in the Global Trade Policy Activity (GTPA) Index,<sup>8</sup> which remained relatively stable from CY 2010 to CY 2020, but has experienced a significant increase since then. Key factors contributing to this rise include trade tensions between the US and China in CY 2019, the onset of the COVID-19 pandemic, the ongoing conflict in Eastern Europe, which began in CY 2022, and global trade tensions in CY 2025.

6 Trade Concentration describes how much of the global trade is concentrated in a small set of countries, and its index is calculated based on the Herfindahl concentration index.

7 UNCTAD. (2025) Global Trade Update, December 2025, <https://tinyurl.com/465jj8ms>.

8 The GTPA Index, developed by economists from the WTO and the IMF, draws insights from a wide range of information on trade policy measures. Using a Dynamic Factor Model, the index captures the dynamics of global trade policy covering 197 countries and territories. The index captures fluctuations in the trade policy, including structural shifts and short-term changes associated with specific events. The underlying data are sourced from the WTO's Trade Monitoring Database and Global Trade Alert, <https://doi.org/10.30875/25189808-2025-7>.

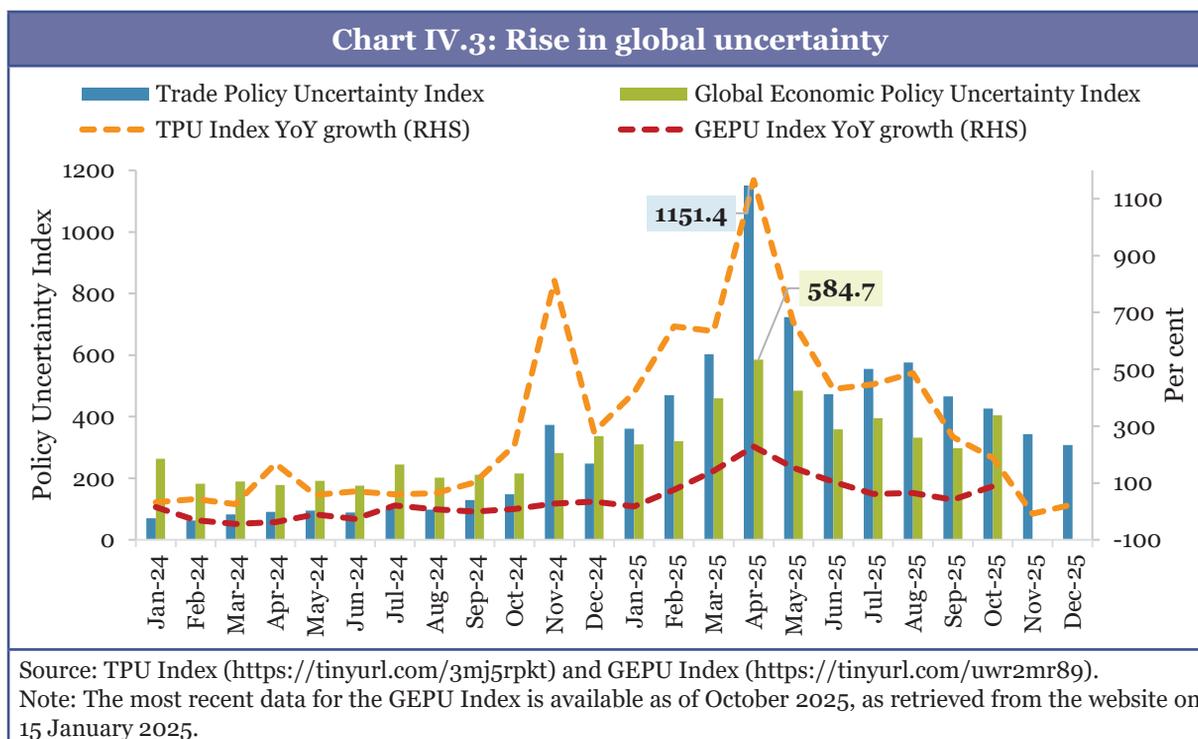
4.10 Chart IV.2 depicts the trends in the GTPA Index alongside measures that facilitate and restrict trade. During the COVID-19 pandemic and the ongoing conflict in Eastern Europe, trade facilitation measures increased in tandem with the implementation of restrictive measures. This was mainly due to countries' efforts to address shock-induced shortages of essential goods, such as medical equipment and raw materials. However, the overall rise in the GTPA Index in CY 2025, amidst global trade tensions, mainly stems from a sharper increase in the implementation of restrictive trade policies compared to trade facilitation measures.



4.11 The year CY 2025 has seen uncertainty reach unprecedented levels, as mentioned in the paragraphs above, posing considerable challenges for global trade. As shown in Chart IV.3, in April 2025, the TPU Index<sup>9</sup> registered an increase of 1165.6 per cent

9 The Trade Policy Uncertainty index (TPU) is constructed by staff in the International Finance Division of the Federal Reserve Board and measures media attention to news related to trade policy uncertainty. The index reflects automated text-search results of the electronic archives of 7 leading newspapers discussing trade policy uncertainty: Boston Globe, Chicago Tribune, Guardian, Los Angeles Times, New York Times, Wall Street Journal, and Washington Post (accessed through ProQuest Historical Newspapers and ProQuest Newsstream). The index is scaled so that 100 indicates that 1 per cent of news articles contain references to TPU.

(YoY); similarly, the GEPU Index<sup>10</sup> registered an increase of 228.2 per cent (YoY).<sup>11,12</sup> These values represent the highest levels recorded since January 1960 and January 1997, respectively, for these indices.



4.12 The sources of this uncertainty are both economic and non-economic in nature. While industrial policies and competition for critical raw materials are driving supportive trade measures, persistent concerns over trade imbalances are simultaneously prompting corrective trade measures. Additionally, some nations are employing trade policy unilaterally to pursue their various domestic goals. These unilateral actions have, in turn, prompted retaliation. As rule-based trading systems weaken, strategic ambiguity is likely to characterise the trade policymaking process, further contributing to uncertainty.<sup>13</sup>

4.13 While a series of trade agreements between the major economies has contributed to a reduction in this uncertainty, it remains elevated due to the absence of clear, transparent, and sustainable agreements among these partners.

<sup>10</sup> The Global Economic Policy Uncertainty (GEPU) Index is a GDP-weighted average of national Economic Policy Uncertainty (EPU) indices for 18 countries. The GDP for each country has been calculated based on purchasing power parity (PPP). Each monthly national EPU index value is proportional to the share of own-country newspaper articles that discuss economic policy uncertainty in that month. The 18 countries covered in the GEPU Index account for approximately 68 per cent of global output on a PPP-adjusted basis and 75 per cent of global output when calculated at market exchange rates as of 2024.

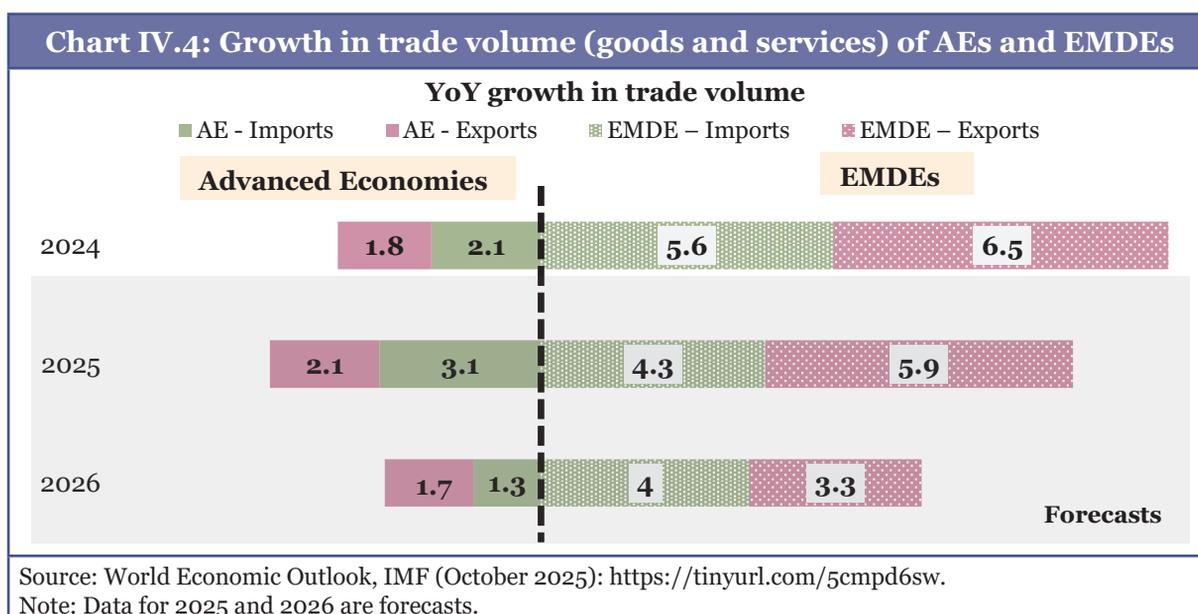
<sup>11</sup> Trade Policy Uncertainty Index, <https://tinyurl.com/3mj5rpkt>.

<sup>12</sup> Geopolitical Economic Policy Uncertainty Index, <https://tinyurl.com/uwr2mr89>.

<sup>13</sup> Ibid note 1.

4.14 The global trade environment, as discussed above, has left a discernible imprint on global trade performance. The frontloading of trade orders in anticipation of higher tariffs has led to a significant increase in trade in CY 2025; however, this positive trend is constrained by ongoing fragmentation, which is seen to limit potential gains. Furthermore, the actual effective tariff rates<sup>14</sup> have lagged behind the effective rate based on the announcements. This delay is attributed to factors such as stockpiling, pauses in tariffs, trade diversion and rerouting.<sup>15</sup>

4.15 As a result, the IMF's World Economic Outlook, October 2025, projected that global trade volume (goods & services) will grow at an average rate of 3.6 per cent during CY 2025 and then decrease to 2.3 per cent in CY 2026, which is markedly lower than the 3.5 per cent growth recorded in CY 2024. However, the trade performance of advanced economies (AEs) exhibits significant differences compared to that of emerging market and developing economies (EMDEs). Although growth forecasts for EMDEs in terms of trade volume for both imports and exports are expected to be higher compared to AEs, trade policy uncertainty is likely to have a more pronounced impact on the trade volumes of EMDEs than on those of AEs.



4.16 In this context, the following section provides an analysis of the performance of India's external sector within the backdrop of the current global environment. Despite ongoing challenges, including geopolitical realignments, trade disruptions, and tightening financial conditions, this sector has proven to be a fundamental pillar of strength for the country.

<sup>14</sup> Actual effective tariff rates are defined as the duty paid on imports at customs as a percentage of the value of imports.

<sup>15</sup> International Monetary Fund. (2025). World Economic Outlook: October 2025, <https://tinyurl.com/5cmpd6sw>.

## TRENDS IN INDIA'S TRADE PERFORMANCE

4.17 Over the past decades, India has significantly deepened its integration with global markets, underpinned by strong export performance, a resilient services trade, and a widening network of trade partnerships. Recent years have showcased the country's trade performance as a reflection of growing competitiveness, diversification, and adaptability to shifting global demand dynamics. Additionally, the consistent rise in non-petroleum merchandise exports highlights the economy's expanding capacity for trade in high-value manufacturing and knowledge-intensive sectors.

4.18 The country's steady rise as a key player in global trade is evident in its increasing share of both global merchandise exports and commercial services exports. Between CY 2005 and CY 2024, India's share of global merchandise exports has nearly doubled, rising from 1 per cent to 1.8 per cent; similarly, its share in global commercial services exports has more than doubled, rising from 2 per cent to 4.3 per cent.<sup>16</sup>

4.19 The country has not only increased its share in global trade but has also diversified its partnerships and the range of products it trades. According to UNCTAD's Trade and Development Report 2025, India ranks third among countries in the Global South in terms of the diversity index of trade partnerships,<sup>17</sup> following China and the UAE. India's index score of 3.2 exceeds that of all countries in the Global North, underscoring its resilience in the face of tariff uncertainties and other emerging challenges. In terms of the merchandise trade diversity indicator,<sup>18</sup> India ranks fourth in the Global South, following Thailand, China and Turkey, with an index score of 0.88. While this score exceeds that of several Global North nations, such as South Korea, it still falls short compared to the scores of the US and the EU, indicating significant opportunities for improvement in this area.<sup>19</sup>

4.20 India's total exports (merchandise and services) have demonstrated consistent and significant growth in recent years, particularly following a robust recovery after the pandemic. Chart IV.5 shows that in FY25, the total exports amounted to USD 825.3 billion, registering a 6.1 per cent (YoY) growth, the highest levels of exports ever recorded. This performance is primarily attributed to the growth of services exports,

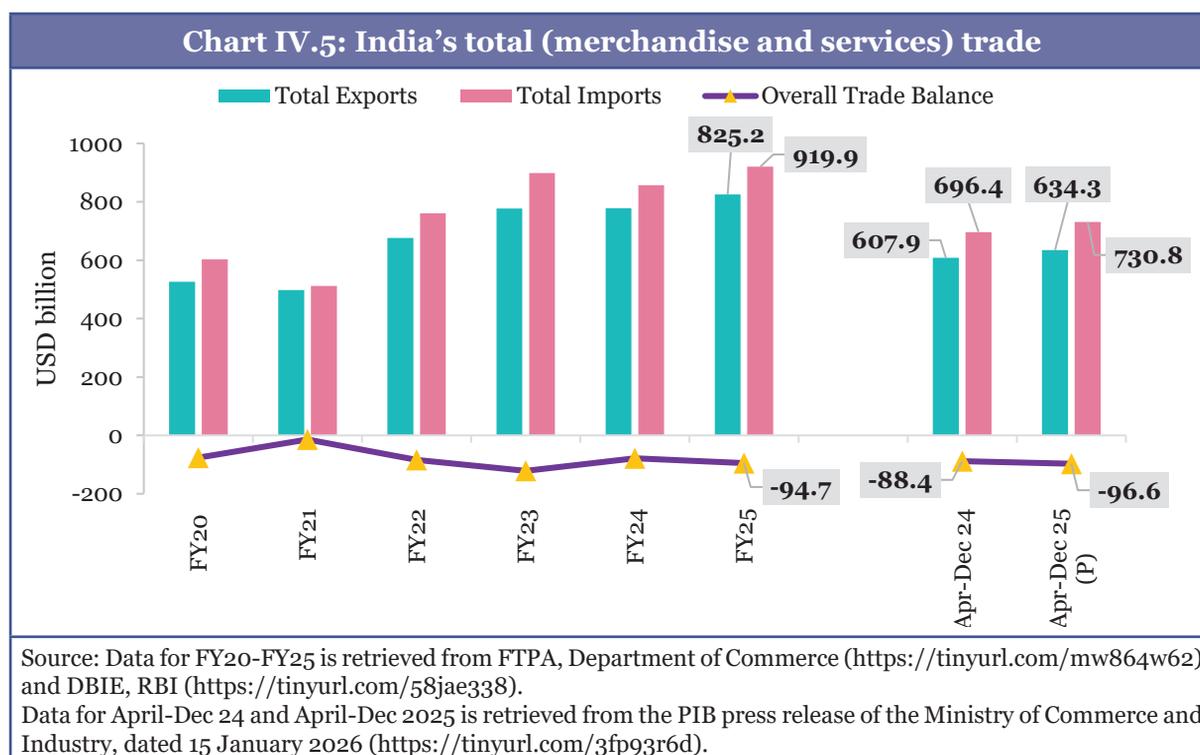
<sup>16</sup> WTO's World Trade Statistics, <https://tinyurl.com/3sxabdnr>.

<sup>17</sup> Composite diversity index of merchandise trade partnerships captures the heterogeneity of an economy's trading relationships. A higher index value indicates wider and more homogeneously distributed trade flows across partners, reflecting greater diversification.

<sup>18</sup> The merchandise trade diversity indicator is calculated based on the Shannon entropy index, which measures the diversification of merchandise trade partnerships and products. The index was computed for the 63 largest economies in terms of aggregated exports and imports: 45 correspond to the global South, and 18 to the global North (the European Union is treated as a single economy). Economies with a wider range and homogeneously distributed export values across product categories have higher scores, indicating higher product-level trade diversity.

<sup>19</sup> UNCTAD. (2025). Trade and Development Report, 2025, <https://tinyurl.com/mkkmkajhv>.

which experienced a 13.6 per cent (YoY) increase. At the same time, the country's total imports also increased by 7.4 per cent (YoY) and stood at USD 919.9 billion. The surplus in services trade cushioned the merchandise trade deficit, and consequently, in FY25, the total trade deficit amounted to USD 94.7 billion. This trade pattern reflects the impact of stronger import demand amid an expanding economy and resilient consumption.



4.21 This strong momentum has been carried forward into FY26 as both Q1 (Apr-June 2025), Q2 (July-Sept 2025) and Q3 (Oct-Dec 2025) recorded their highest-ever export levels for their respective quarters, despite ongoing global uncertainties. Furthermore, during April-December 2025, exports totalled USD 634.3 billion, a 4.3 per cent (YoY) increase, whereas imports increased by 4.9 per cent (YoY) to USD 730.8 billion. During the same period, the trade deficit increased to USD 96.6 billion compared to USD 88.4 billion in the corresponding period of the previous year.

## Merchandise trade

4.22 The merchandise trade performance exhibits the economy's ability to hold ground amid a volatile global environment. It reaffirms its position as a reliable trading partner and an emerging force in global trade. Chart IV.6 depicts the trends in the country's merchandise trade in recent years. In FY25, India's merchandise exports totalled USD 437.7 billion, maintaining similar levels to those observed in FY24. While aggregate merchandise export growth may appear subdued, it is imperative to acknowledge

that non-petroleum, non-gems and jewellery exports, accounting for 78.7 per cent of aggregate merchandise exports, exhibited a robust growth rate of 7.5 per cent (YoY) during the same period. Further, the non-petroleum exports reached a historic high of USD 374.3 billion. This underscores the inherent strength of the export sector, which volatility in the exports of gems and jewellery and petroleum may obscure. Consequently, the perceived stagnation in total merchandise exports can largely be attributed to the disproportionate influence of petroleum and gems and jewellery, which often masks the more favourable trends present within the broader export sector.

4.23 In FY25, the export composition was predominantly concentrated in petroleum products, telecom instruments, drug formulations and biologicals. Collectively, these sectors account for approximately a quarter of the total exports. The exports of petroleum products declined by 24.7 per cent (YoY), amid softer crude oil prices, which decreased by 15.4 per cent (YoY).<sup>20</sup> Exports of telecom instruments witnessed a significant growth of 51.2 per cent (YoY) while those of drug formulations and biologicals experienced a growth of 11.2 per cent (YoY). These trends are a testament to the country's increasing strength in electronic manufacturing and reaffirm its position as a global pharmaceutical hub. Among the other principal commodities, steady gains were observed in exports of electric machinery and equipment, ready-made garments made from cotton, and motor vehicles/cars.

4.24 On the import side, merchandise imports increased by 6.3 per cent (YoY) in FY25, amounting to USD 721.2 billion. This increase was primarily driven by a rise in non-petroleum, non-gems and jewellery imports, which increased to USD 446.5 billion from USD 421 billion in FY24. This trend is attributed to a higher demand for critical intermediate inputs and capital goods, indicating a resilient domestic demand.

4.25 In FY25, India's import composition continues to be dominated by petroleum crude, gold and petroleum products, with these sectors accounting for over one-third of total imports. Imports of petroleum crude increased marginally by 2.7 per cent (YoY) amid softer crude oil prices, reflecting stable energy demand, while gold imports increased by 27.4 per cent (YoY). The increase in gold imports may be attributed to a rise in gold prices, increasing by 38.2 per cent (YoY) and driven by strong domestic consumption.<sup>21</sup> Additionally, imports of electronic components, telecom instruments and computer hardware also experienced significant growth.

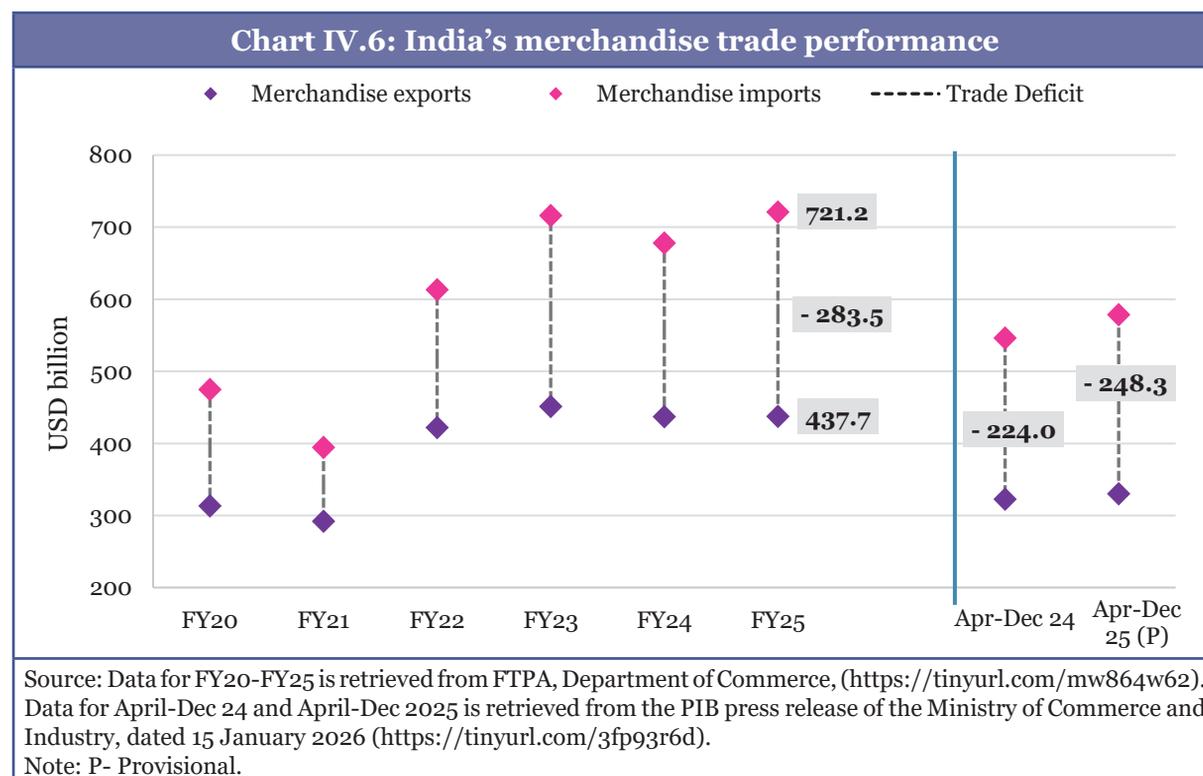
4.26 This trend suggests that as India's exports of finished products rise, there is a concomitant increase in the import of their intermediate products, implying a continuous

---

<sup>20</sup> World Bank. (n.d.). Commodity price data (The Pink Sheet), accessed on 4 November 2025, <https://tinyurl.com/ywzwwfpc2>.

<sup>21</sup> Ibid note 20.

improvement in the country's manufacturing abilities. A rise in merchandise imports in conjunction with stable merchandise exports resulted in a widening of the merchandise trade deficit, which reached USD 283.5 billion, marking a 17.6 per cent (YoY) increase in FY25.



4.27 The merchandise trade performance in FY26 so far reflects a continuation of the trends prevailing in FY25. During April-December 2025, merchandise exports have registered a growth of 2.4 per cent (YoY), while non-petroleum, non-gems and jewellery exports increased by 6.0 per cent (YoY), signalling sustained strength in India's core export basket. This increase in exports is driven by electronics goods, which grew by 35.1 per cent (YoY). The exports of mica, coal, and other ores and minerals, including processed minerals, grew by 14.7 per cent (YoY), whereas marine product exports grew by 15.5 per cent (YoY).

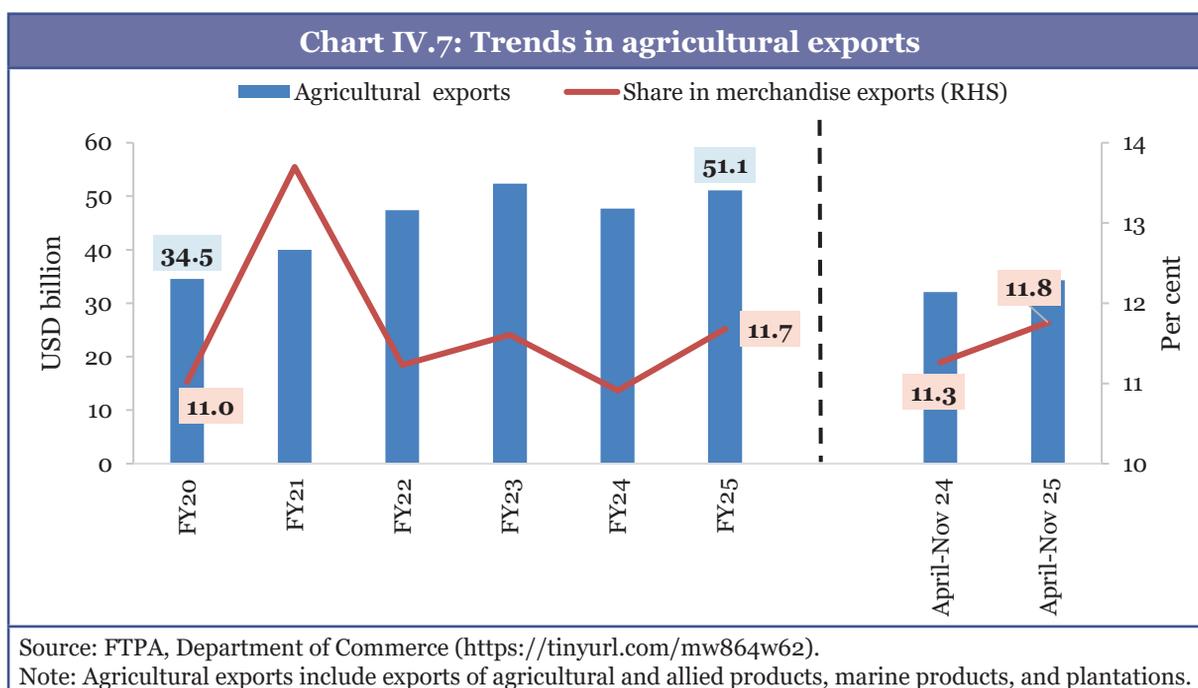
4.28 On the imports side, merchandise imports amounted to USD 578.6 billion, registering a 5.9 per cent (YoY) increase. Furthermore, non-petroleum and non-gems and jewellery imports witnessed a higher growth of 9.5 per cent (YoY) in the same period, reflecting resilient domestic demand for both consumption and production. This increase is attributed to an increase in imports of electronic goods (17.1 per cent YoY) and machinery, electrical and non-electrical (14.2 per cent YoY), which support the country's manufacturing and technology sectors. Furthermore, a substantial increase in imports of chemical material and products (44.4 per cent) suggests steady industrial demand in the economy. As a result, the merchandise trade deficit widened to USD

248.3 billion in April-December 2025 from USD 224.0 billion in the corresponding period of the previous year.

### Performance of agricultural exports

4.29 During FY20-FY25, India's merchandise exports grew with a compounded average growth rate (CAGR) of 6.9 per cent. In comparison, agricultural exports increased from USD 34.5 billion in FY20 to USD 51.1 billion in FY25, registering a CAGR of 8.2 per cent. During the same period, the share of agricultural exports in the country's merchandise exports has varied between 11 per cent and 14 per cent. However, between FY23 and FY25, the country's agriculture exports have stagnated. Whereas, global export of agricultural products rose from USD 2.3 trillion in CY 2022 to USD 2.4 trillion in CY 2024.<sup>22</sup>

4.30 India is the world's second-largest agricultural producer by value.<sup>23</sup> However, according to the WTO's World Trade Statistics, the country's share in global agricultural exports has increased only modestly from 1.1 per cent in 2000 to 2.2 per cent in 2024.<sup>24</sup> This disparity between production value and export performance highlights the significant untapped potential for expanding trade in agricultural products.



4.31 The country has the potential to reach USD 100 billion of combined exports of agriculture, marine products and food and beverage in the next four years.<sup>25</sup> Agricultural

<sup>22</sup> WTO Stats, <https://tinyurl.com/47knvh6m>.

<sup>23</sup> FAOSTAT, <https://tinyurl.com/48dunxfn>.

<sup>24</sup> Table 13: Top 10 exporters and importers of agricultural products, WTO World Trade Statistics, 2024, <https://tinyurl.com/52cm3675>.

<sup>25</sup> PIB Press release of the Ministry of Commerce and Industry, dated 10 January 2025, <https://tinyurl.com/yc2x3ppj>.

exports are influenced by a range of supply-side factors, including food security, processing facilities, infrastructure bottlenecks, and various regulations. However, given the volatility in domestic prices and production of certain commodities, trade policy has often been employed to achieve short-term domestic objectives, such as managing inflation through product-specific interventions, including ad hoc export bans or the imposition of minimum export prices. Frequent policy changes can significantly disrupt export supply chains, create market uncertainty and cause foreign buyers to switch to other sources. Export markets once lost are not easily recovered.

4.32 Although these measures may temporarily stabilise domestic prices, they risk longer-term reputational costs, particularly as India is widely regarded as a source of high-quality agricultural products. Therefore, measures such as subsidised distribution of essential food items via the public distribution system, managing buffer stocks and intervening in the market via an open market sale scheme, using the Essential Commodities Act, 1955 to prevent hoarding and speculation, and deploying the price stabilisation fund to convert buffer stock for retail sale are the policy options available to ensure availability of agricultural products at fair prices for the domestic market. It is possible to stabilise domestic availability and prices while enabling farmers to tap global markets for better incomes.

4.33 By maintaining a delicate balance between fulfilling domestic demand and harnessing its export potential, India's remarkable achievements in agricultural production can translate into export-led growth, enabling the country to achieve its goal of USD 100 billion in agricultural exports. Exports also make farmers more productive and competitive by fostering knowledge accumulation and market feedback.

4.34 As an aspirational economy, India will see its imports rise steadily. That is the global experience over centuries. India must explore all opportunities to increase its export earnings to pay for the import needs of a growing economy. Agricultural exports are a low-hanging fruit with immense export potential. Importantly, they carry international leverage for India. Policies, therefore, must be aligned with this imperative.

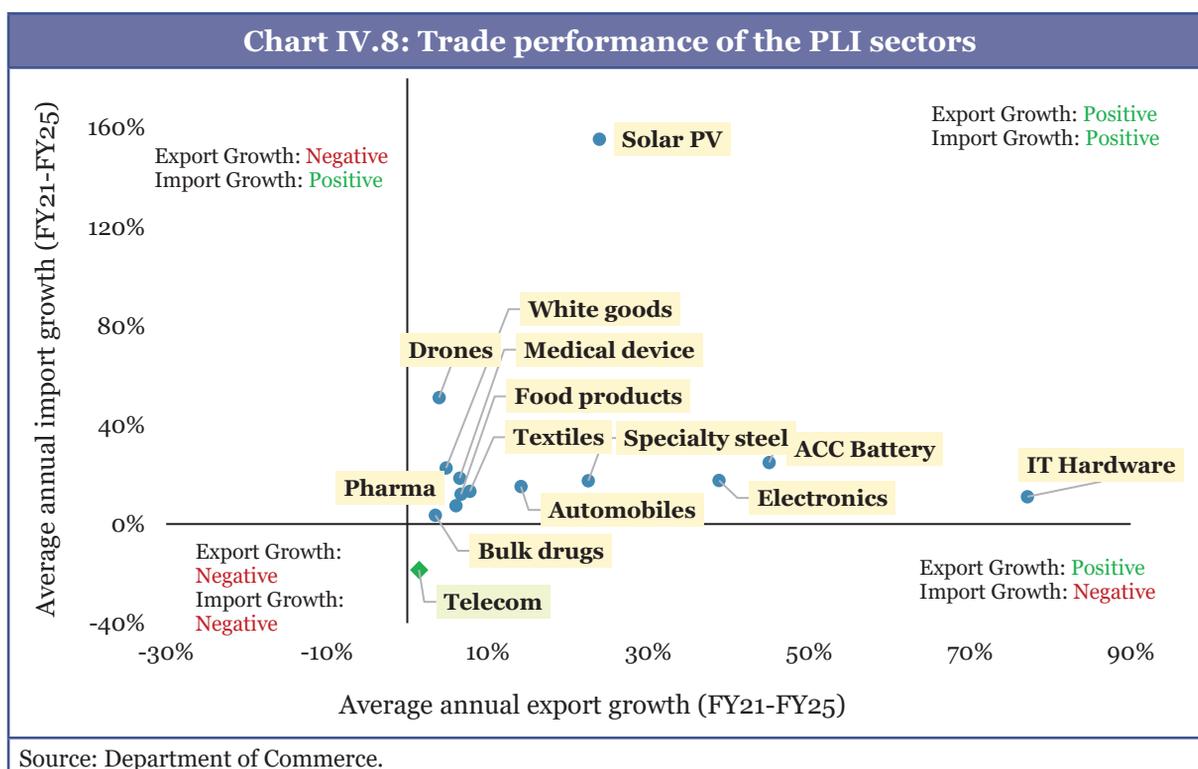
### **Trade Performance of Production-Linked Incentive Scheme Sectors**

4.35 The PLI scheme was introduced in April 2020 to enhance domestic manufacturing and promote exports. Initially, it encompassed sectors such as mobile manufacturing, specific electronic components, active pharmaceutical ingredients, and medical devices. However, as the scheme evolved, it expanded to encompass a total of 14 sectors, reflecting a strategic approach to enhancing India's manufacturing capabilities.

4.36 A notable outcome of the PLI initiative has been the remarkable trade performance of these sectors. During the period FY21-FY25, the average annual growth rate (AAGR)

of exports from this sector stands at 10.6 per cent, while imports have experienced an AAGR of 12.6 per cent.

4.37 However, there exists a variation in the trade performance within these sectors. A few sectors recorded high export growth (with their AAGR exceeding 20 per cent, on average, during FY21-FY25). These include IT hardware (77.2 per cent), ACC batteries (45.0 per cent), electronics (38.8 per cent), solar PV (23.9 per cent), and speciality steel (22.5 per cent). This export expansion has generally been accompanied by an increase (AAGR) in imports that has been moderate in electronics (17.6 per cent), IT hardware (11 per cent) and speciality steel (17.5 per cent), but substantially higher in solar PV (155.4 per cent) and ACC batteries (24.9 per cent). These trends indicate a scaling up of production capacity and the integration of value chains, suggesting that domestic manufacturing is not only maturing but is also beginning to leverage imported intermediate goods to facilitate higher-value exports.

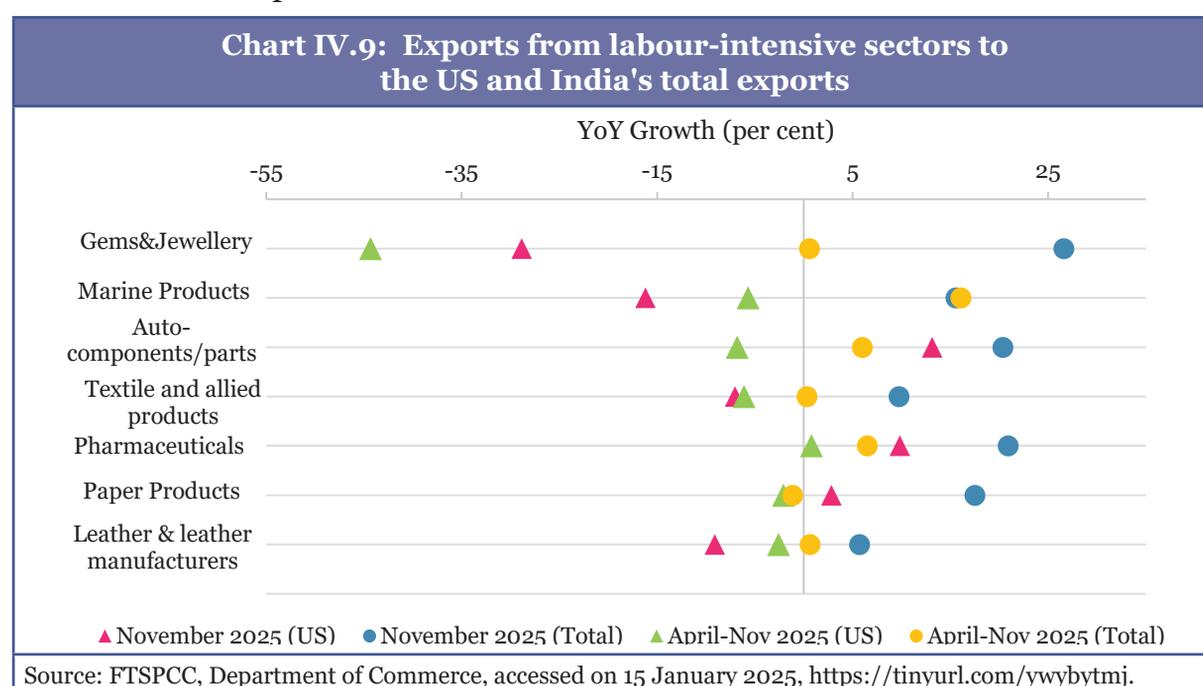


4.38 In contrast, certain sectors demonstrated moderate export growth (with their AAGR below 20 per cent), which include automobiles (14.1 per cent), textiles (7.8 per cent), food products (6.7 per cent), pharma (6.0 per cent), medical devices (6.5 per cent), white goods (4.8 per cent), bulk drugs/ Active Pharmaceutical Ingredients (APIs) (3.5 per cent), and drones (3.9 per cent). Most of these sectors have also experienced positive import growth (AAGR), for instance, automobiles (15.1 per cent), textiles (13.2 per cent), food products (12.1 per cent), and pharma (7.4 per cent), suggesting a steady expansion of domestic activity alongside continued reliance on imported inputs and technology.

4.39 In particular, the telecom sector has achieved notable success, with exports rising by 1.5 per cent (AAGR) while imports have concurrently declined by 18.5 per cent (AAGR). This trend indicates an early accomplishment in import substitution, aligning with the PLI framework's overarching objective of enhancing market penetration abroad. Collectively, these developments illustrate the success of the PLI scheme in boosting the country's export growth.

### Diversification of India's export destinations and import sources

4.40 India is currently subject to an effective export tariff rate of 50 per cent on goods exported to the US, and this rate is among the highest imposed on any country.<sup>26</sup> There has been progress in the negotiations of the trade deal between the two countries.<sup>27</sup> While there has been some specific impact of the tariffs, Chart IV.9 illustrates the resilience of India's overall exports in some labour-intensive and small-scale sectors, primarily attributed to diversification towards alternative destinations. This is evident in the chart, which shows a YoY decline in exports to the US during the period April–November 2025 (indicated by the green triangle). In contrast, India's exports to the world have shown positive growth (YoY) (indicated by the yellow dots). These trends of diversification are presented in Table IV.1.



<sup>26</sup> US President's Executive Order: Further modifying the reciprocal tariff rates dated July 31, 2025 (<https://tinyurl.com/29aphjt9>) and US President's Executive Order: Addressing threats to the United States by the government of the Russian Federation dated August 06, 2025 (<https://tinyurl.com/ykzcr8tw>).

<sup>27</sup> Currently, six rounds of negotiations have already been held between India and the US. Both nations have expressed a commitment to continue their dialogue with the aim of reaching an early conclusion of a mutually beneficial trade deal. Further, the recent US decision to exempt over 200 agricultural and food products from elevated tariffs marks a constructive shift in India–US trade dynamics. The move restores price competitiveness for key Indian exports, including spices, tea, coffee, nuts, and processed foods, helping offset earlier tariff pressures that had constrained market access. Source: As per information from Department of Commerce and PIB Press release of the Ministry of Commerce and Industry dated 26 September, 2025: <https://tinyurl.com/5dh99ez>.

**Table IV.1. Alternative destinations for India's exports**

Sector	India's exports to the US and the World during April-November FY26 over April-November FY25	Alternative destinations for India's exports
(All figures in parentheses represent YoY growth rates of exports for April-November FY26 compared to April-November FY25.)		
<b>Gems and jewellery<sup>28</sup></b> 	<ul style="list-style-type: none"> <li>• US (-44.3)</li> <li>• World (0.6)</li> </ul> <p>(The US's share in India's total exports of gems and jewellery decreased to 18.7 per cent from 33.7 per cent during the same period.)</p>	<ul style="list-style-type: none"> <li>• For gems and jewellery: UAE (34.9) and Hong Kong (23.4)</li> </ul> <p>(The share of UAE and Hong Kong in India's total exports of gems and jewellery increased to 53.6 per cent from 41.4 per cent during the period.)</p> <ul style="list-style-type: none"> <li>• For gold and precious metal jewellery: Bahrain (125.5) and Saudi Arabia (107.9), and France (44.4) and the UK (27.9).</li> <li>• For pearls, precious and semi-precious stones: Canada (179.5) and Mexico (7510.5), and China (166.1)</li> </ul> <p>(Exports from this sector are continuing to benefit from the India-UAE CEPA, and it is anticipated that exports to the UK will increase significantly in the coming years due to the recently signed India-UK FTA. This development is likely to have a positive influence on other markets, both existing and potential.)<sup>29,30</sup></p>
<b>Marine products</b> 	<ul style="list-style-type: none"> <li>• US (-5.7)</li> <li>• World (16.1)</li> </ul>	<ul style="list-style-type: none"> <li>• Asian countries: Vietnam (99.8), Malaysia (59.2), China (20.4).</li> <li>• Other countries: Belgium (90.4), Russia (45.6), Denmark (4830.2), Germany (51.9), Poland (252.7) and Sri Lanka (220.1).</li> </ul>

<sup>28</sup> Gems and Jewellery include pearls, precious and semi-precious stones and gold and other precious metal jewellery, excluding exports of gold, silver and other precious and base metals.

<sup>29</sup> The Gem & Jewellery Export Promotion Council. (2025). Gem & jewellery trade trends quarterly (Q2) FY2025-2026 (Jul '25 - Sep '25), <https://tinyurl.com/56eeyc2f>.

<sup>30</sup> Patra, M. D. (2025, November 15). One door closes; another opens. Basis Point Insight, <https://tinyurl.com/y32f6ebk>.

<p><b>Auto components/ parts</b></p> 	<ul style="list-style-type: none"> <li>• US (-6.8)</li> <li>• World (6.0)</li> </ul>	<ul style="list-style-type: none"> <li>• UAE (84.5), Germany (33.5), Belgium (77.7), Slovenia (96.9), Myanmar (189.9), Brazil (24.7), Nepal (49.4) and Bangladesh (20.4).</li> </ul> <p>(UAE's share in India's exports of auto components has increased to 5.3 per cent from 3 per cent during the period.)</p>
<p><b>Textiles and allied products exports<sup>31</sup></b></p> 	<ul style="list-style-type: none"> <li>• US (-6.1)</li> <li>• World (0.3)</li> </ul>	<ul style="list-style-type: none"> <li>• For cotton fabrics, made-ups, etc: Nigeria (72), Senegal (29.7), Sudan (1114.4), Colombia (46.7), Sweden (47.2), Uganda (221.5) and UAE (9.5).</li> <li>• For manmade yarn, fabrics and made-ups: UAE (14.3), Germany (26.3), Netherlands (34.1), Spain (25.1), Italy (20.1) and Senegal (161.9).</li> <li>• For ready-made garments of cotton, including accessories: UAE (22.1), Poland (24.9), Spain (15.3), Japan (28), France (14.1) and Hong Kong (68.7).</li> <li>• For silk carpets: UAE (103.1)</li> </ul> <p>(The US's share in India's exports of silk carpets declined significantly from 42.4 per cent to 21.5 per cent over the period; conversely, the UAE's share increased from 37.6 per cent to 58.7 per cent during the same period.)</p>

<sup>31</sup> Textiles and allied products include raw wool, raw jute, raw cotton including waste, raw silk, silk waste, coir and coir manufactures, natural silk yarn, fabrics and made-ups, silk carpets, woollen yarn fabrics and made-ups, cotton yarn, jute yarn, readymade garments of silk, other jute manufactures, jute hessian, floor coverings made of jute, handloom products, readymade garments of wool, manmade staple fibre, other textile yarn and fabrics, readymade garments of manmade fibres, manmade yarn, fabrics and made-ups, handmade carpets (excluding silk), readymade garments of other textile materials, cotton fabrics and made ups and readymade garments of cotton including accessories.

<p><b>Pharmaceutical products<sup>32</sup></b></p> 	<ul style="list-style-type: none"> <li>• US (0.8)</li> <li>• World (6.5)</li> </ul> <p>(Although India primarily exports generic drugs to the US, there was a decrease in pharmaceutical exports to the US by -23.7 per cent YoY in October 2025. This decline in exports in October 2025 can be attributed to uncertainty regarding tariffs on generic drugs, which led Indian exporters to pre-emptively reduce their reliance on the US market. However, the trend reversed in November 2025, with pharmaceuticals exports to the US increasing by 9.8 per cent YoY.)</p>	<ul style="list-style-type: none"> <li>• For AYUSH and herbal products: Vietnam (88.8) and Nigeria (89.4), Italy (7.6), Russia (16.6)</li> <li>• For bulk drugs and drug intermediaries: Netherlands (22.2), Brazil (15.5) and France (20.7).</li> <li>• For drug formulations and biologicals: Nigeria (58.0), Mexico (53.12) and the Republic of Tanzania (50.6).</li> <li>• For surgicals: Sri Lanka (114.9), Spain (28.6), Nigeria (154.6) and Saudi Arabia (70.2).</li> <li>• For surgicals: Sri Lanka (114.9), Spain (28.6), Nigeria (154.6) and Saudi Arabia (70.2).</li> </ul>
<p><b>Paper products<sup>33</sup></b></p> 	<ul style="list-style-type: none"> <li>• US (-2.1)</li> <li>• World (-1.2)</li> </ul> <p>(The diversification to other countries has not been sufficient to offset the overall drop in exports to the U.S, as it accounts for a significant share of India's exports of paper products.)</p>	<ul style="list-style-type: none"> <li>• For books, publications and printing: Kenya (280.7), Republic of Tanzania (111.2), Malawi (450.0), Ethiopia (340.5)</li> <li>• For paper, paperboard and products: Bangladesh (19.5), Russia (59.8) and Oman (43.5).</li> <li>• For plywood and allied products: Vietnam (147.8), Poland (75.0), Spain (19) and the UK (9.2).</li> </ul>
<p><b>Leather Products<sup>34</sup></b></p> 	<ul style="list-style-type: none"> <li>• US (-2.6)</li> <li>• World (0.6)</li> </ul>	<ul style="list-style-type: none"> <li>• For leather footwear: Austria (88.8), the Netherlands (20.8), the UAE (31.4) and Germany (4.5).</li> <li>• For leather garments: France (40.7), UK (28.5), Colombia (100), Austria (114.9) and Russia (36.9).</li> <li>• For leather goods: Spain (16.8), the Netherlands (12.7), Chile (51.8), Belgium (26.1) and Norway (117.5).</li> </ul>

32 Pharmaceutical products include AYUSH and herbal products, surgicals, bulk drugs, drug intermediaries, drug formulations and biologicals.

33 Paper products include paper, paperboard and products, pulp and waste paper, other wood products, plywood and allied products, newsprint and books, publications and printing.

34 Leather products include finished leather, leather goods, leather garments, leather footwear, leather footwear components, and saddlery and harness.

4.41 A notable increase in the diversity of countries from which India imports crude oil has been observed. In FY26 (April-November), crude oil imports from Libya, Egypt, Brazil, the US and Brunei increased significantly compared to the same period in FY25, while those from Russia, Saudi Arabia, Iraq and Venezuela declined.

4.42 Although imports from other countries account for a significant portion of India's crude oil imports, the shares of the US, Egypt, UAE, Nigeria and Libya have increased. Between April-November 2025, the share of imports from the US increased to 8.1 per cent from 4.6 per cent in the same period in FY25, while UAE's share increased to 11.1 per cent from 9.4 per cent, Egypt's share increased to 1.4 per cent from 0.3 per cent, Nigeria's share increased to 3.3 per cent from 2.2 per cent and Libya's share increased to 0.5 per cent from 0.1 per cent.

4.43 The foregoing section discusses the country's resilient and robust merchandise trade performance. Nevertheless, these outcomes also point to a larger opportunity: sustaining export momentum will require diversification towards higher-value, more sophisticated products and new destinations.

4.44 While the export performance of the PLI sectors indicates an improvement in the country's domestic manufacturing capabilities, a broader assessment of India's export basket's composition and diversification reveals further potential for improvement. In 2023, India ranks 44th out of 145 countries on the Economic Complexity Index (ECI)<sup>35,36</sup> as measured by the Harvard Atlas of Economic Complexity.<sup>37,38</sup> Although this represents an improvement from India's 57th position in CY 2013, its ranking has remained unchanged since CY 2019. This can be attributed to India's export composition, which remains concentrated on goods such as refined petroleum, diamonds, jewellery, packaged medicines, and rice, and much of the country's export

---

35 Economic complexity is a measure of the knowledge in a society as expressed in the products it makes. The economic complexity of a country is calculated based on the diversity of exports a country produces and their ubiquity, or the number of countries able to produce them (and those countries' economic complexity). Countries that are able to sustain a diverse range of productive know-how, including sophisticated, unique know-how, are found to be able to produce a wide diversity of goods, including complex products that few other countries can make.

36 Ranking of the Export Complexity Index - A rank of countries based on how diversified and complex their export basket is. Countries that are home to a great diversity of productive know-how, particularly complex, specialised know-how, are able to produce a great diversity of sophisticated products. The complexity of a country's exports is found to highly predict current income levels, or where complexity exceeds expectations for a country's income level, the country is predicted to experience more rapid growth in the future. ECI therefore provides a useful measure of economic development.

37 Hausmann, R., Hidalgo, C. A., et al. (2011). The atlas of economic complexity: Mapping paths to prosperity, <https://tinyurl.com/mrrtuu2a>.

38 Harvard Growth Lab - Country & Product Complexity Rankings, <https://tinyurl.com/yzkaefh6>.

growth comes from products that fall into low- and mid-complexity categories.<sup>39,40</sup> The dominance of mid-tech and low-complexity goods underscores the imperative for India to pursue a significant structural shift towards high-complexity categories, including advanced machinery, precision engineering goods, electronics, chemicals, and high-value services.<sup>41</sup>

4.45 The country's underutilised productive capabilities are revealed through the gap between its relatively modest ECI ranking and its second rank globally on the Economic Complexity Outlook Index (COI),<sup>42</sup> which evaluates future potential to diversify into more sophisticated products based on existing capabilities.<sup>43</sup> Many high-complexity products are within India's current ability limits, implying that targeted industrial policies, technological improvements, and export-driven ecosystem development could yield significant benefits. Realising this potential, however, requires a strong and competitive domestic manufacturing ecosystem. To fulfil the potential indicated by the country's COI ranking, the domestic manufacturing ecosystem needs to be further scaled up, product quality to be consistently maintained at scale, and a robust innovation, research and development ecosystem established.

4.46 In this direction, the government has introduced initiatives such as the Anusandhan National Research Foundation (ANRF) and the Research, Development & Innovation Fund (RDIF), complemented by initiatives such as Make in India and the PLI schemes. Collectively, these initiatives aim to strengthen India's research ecosystem, expand its innovation capacity, and enhance its technological depth, as discussed in Chapter 8 of this Survey.

4.47 Beyond strengthening R&D and innovation, realising India's manufacturing and GVC potential also requires streamlining cross-border operating rules that materially

---

39 Bhowmick, S. (2020, September 15). Towards a more 'sophisticated' Indian economy. ORF Expert Speak, <https://tinyurl.com/bdu3u72n>.

40 Country profile: India (The atlas of economic complexity), <https://tinyurl.com/3b72z7cd>.

41 The Product Complexity Index (PCI) ranks the diversity and sophistication of the productive know-how required to produce a product. PCI is calculated based on how many other countries can produce the product and the economic complexity of those countries. In effect, PCI captures the amount and sophistication of know-how required to produce a product. Economic complexity is a measure of the knowledge in a society, as expressed in the products it produces. The most complex products (that only a few countries with a high economic complexity can produce) include sophisticated machinery, electronics and chemicals, as compared to the least complex products (that nearly all countries, including the ones with low economic complexity can produce), including raw materials and simple agricultural products. Specialised machinery is said to be complex as it requires a range of know-how in manufacturing, including the coordination of a range of highly skilled individuals' know-how.

42 The Economic Complexity Outlook Index (COI) is a measure of how many complex products are near a country's current set of productive capabilities. The COI captures the ease of diversification for a country, where a high COI reflects an abundance of nearby complex products that rely on similar capabilities or know-how as that present in current production. Complexity outlook captures the connectedness of an economy's existing capabilities to drive easy (or hard) diversification into related complex production, using the Product Space. A low complexity outlook reflects that a country has few products that are a short distance away, so will find it difficult to acquire new know-how and increase their economic complexity.

43 Ibid note 38.

affect transaction costs and investor certainty. India's manufacturing-led growth strategy and deeper participation in GVC underscore the need for closer coordination between transfer pricing (under income-tax law) and customs valuation (under customs law) in respect of related-party imports. While transfer pricing provisions are designed to prevent over-pricing of imports and customs valuation rules address under-invoicing, both frameworks are anchored in the arm's length principle. They are aligned with internationally accepted standards, including those of the Organisation for Economic Co-operation and Development and the World Customs Organisation.

4.48 Currently, identical import transactions are often examined separately by income tax and customs authorities, resulting in duplication of compliance, higher transaction costs, and the risk of inconsistent outcomes for the industry. Given the conceptual similarities in valuation methods under the two regimes, there is a clear opportunity to move towards a collaborative convergence approach.

4.49 A structured framework enabling aligned methodologies, converged documentation by taxpayers, and coordinated administrative review can ensure greater certainty and predictability of tax outcomes for businesses while safeguarding revenue interests. Such convergence would reduce compliance burden, minimise disputes, enhance transparency in cross-border trade, and improve ease of doing business, thereby strengthening India's attractiveness as a global manufacturing and investment destination.

4.50 The global economic landscape is becoming increasingly unpredictable, driven by tariff increases, supply chain adjustments, and higher regulatory hurdles. For Indian industries, the current wave of U.S. tariff implementations and stricter non-tariff barriers presents a significant challenge, particularly for export-oriented sectors. The experience of India's pharmaceutical industry during the shift to the WTO's Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) is one of the most important moments of structural adjustment undertaken by an Indian industry in the post-reform era. Box IV.1 presents a case study of the pharmaceutical sector as an example of how the industry can reinvent itself in the face of global challenges and progress. The lessons are particularly relevant in the present times of increasing trade uncertainties and protectionist trends.

**Box IV.1: Pharmaceutical sector's transformation in the aftermath of TRIPS Agreement: Lessons for India Inc.**

The pharmaceutical sector, which had expanded under the process-patent regime of the 1970 Patent Act, faced a sudden change in its operating environment when the TRIPS-compliant product-patent regime took effect in CY 1995. This shift challenged the very foundation of India's competitive advantage, reverse engineering, and cost-efficient process innovation.<sup>44</sup>

<sup>44</sup> Chaudhuri, S. (2005). The WTO and India's pharmaceuticals industry: Patent Protection, TRIPS, and Developing Countries. Oxford University Press, USA, <https://tinyurl.com/4fs2p2d5>.

However, the manner in which the sector responded offers a compelling template for industries currently confronting rising external trade barriers, especially tariff escalations in major markets. The episode underscores how an external shock can catalyse capability creation, market repositioning, and long-term global competitiveness when firms undertake strategic upgrading.

### Nature of the TRIPS shock

The process-patent regime enabled Indian firms to legally replicate patented drugs by developing alternative production pathways, thereby creating one of the most affordable pharmaceutical ecosystems in the world. TRIPS, however, mandated a 20-year product-patent regime,<sup>45</sup> eliminating this legal flexibility. This could be characterised as a “deep institutional disruption.” Firms faced a loss of freedom to reverse-engineer patented molecules, escalating costs due to regulatory, documentation, and clinical requirements, along with higher entry barriers that favoured IP-rich multinational firms.

This shift sparked fears of sectoral contraction. However, rather than shrinking, the sector leveraged the disruption to develop deeper capabilities, expand into new markets, and strengthen its integration with GVCs.

### Industry Response

**Rewiring Internal Capabilities:** The earliest and most important response to the TRIPS shock was a clear shift toward developing internal capabilities. Indian pharmaceutical companies moved beyond simple process improvements. They began investing heavily in formulation science, transitioning R&D from reverse-engineering existing drugs to creating New Chemical Entities, cost-efficient Novel Drug Delivery Systems, and complex generics that meet global regulatory standards.<sup>46</sup> Industry-wide R&D spending grew from ₹ 1250 million in FY94 to nearly ₹209.8 billion by FY19.<sup>47,48,49</sup>

This expanded scientific and technological foundation fostered innovation-led competitiveness. By strengthening internal capabilities early on, Indian firms positioned

45 Agreement on Trade-Related Aspects of Intellectual Property Rights. In agreement on trade-related aspects of intellectual property rights (pp. 319–322): Article 27 of the TRIPS agreement mandated patents to be granted for any invention, including product & process, in all fields of technology, that involved an inventive step and was capable of industrial use. This protection was to be granted for a minimum of 20 years as per Article 33 of the same agreement: <https://tinyurl.com/4bv2c7ac>. Owing to these provisions, which India signed up for following its entry into the WTO and consequently the TRIPS agreement, Article 5 of the Patents Act, 1970, which allowed patents for the process of manufacture, was amended in 2005 to permit only product patents. This curtailed the pharmaceutical industry from producing generic medicines for patented drugs, without giving them royalties: <https://tinyurl.com/34w6fn2m>.

46 Rai, R. K. (2008). Battling with TRIPS: Emerging Firm Strategies of Indian Pharmaceutical Industry Post-TRIPS. In *Journal of Intellectual Property Rights*: Vol. Vol 13 (pp. 301-317), <https://tinyurl.com/mrm6xvhn>.

47 Kiran, R., & Mishra, S. (2011). Research and Development, Exports and Patenting in the Indian Pharmaceutical Industry: a Post TRIPS Analysis. In Thapar University & MM University, *Eurasian Journal of Business and Economics* (Vol. 4, Issue 7, pp. 53–67) [Journal-article], <https://tinyurl.com/3r3jbfhx>.

48 Jain, S. & Indian Pharmaceutical Alliance. (2023). Thrust on Innovation & R&D fundamental for Indian Pharma’s Growth, <https://tinyurl.com/2r8zeade>.

49 In 2018-19, the overall expenditure on pharma R&D in India was approximately USD 3 billion. Based on INR’s financial year’s annual average exchange rate of 69.923, it translates to ₹209.8 billion.

themselves to enter and grow in regulated export markets. This is a strategic lesson for modern sectors now facing tariff-driven external shocks: competitiveness must be developed before it is demanded.

**Market Diversification as a Structural Hedge:** A second primary strategic response was rapid market diversification. As TRIPS-era constraints narrowed domestic opportunities, Indian pharmaceutical firms pivoted outward, targeting regulated markets such as the US and Europe by filing large-scale Drug Master Files (DMFs)<sup>50</sup> for APIs and Abbreviated New Drug Applications<sup>51</sup> for generics. India's global share of DMF filings rose sharply from 14.5 per cent in CY 2000 to 48.7 per cent by CY 2007, with 331 active DMF filings by India in 2019.<sup>52</sup> These filings helped the pharmaceutical industry penetrate these markets despite the restrictions of the TRIPS agreement. This demonstrated a core structural insight: over-reliance on a single market magnifies vulnerability, while multi-market exposure insulates firms from tariff shocks.

**Collaborative and Risk-Sharing Innovation Models:** Indian companies adopted innovation models suited to a patent-heavy environment. Out-licensing, which enabled firms to develop molecules during early stages and then partner with multinationals, generated milestone-based revenue while lowering R&D risk. In parallel, India's emergence as a global hub for Contract Research and Manufacturing Services (CRAMS) is attributed to the country's strong scientific talent and production costs that are 30-40 per cent lower than those of other nations. As a result, India entered the global CRAMS market, valued at USD 532.10 million in CY 2005, and is expected to grow to USD 90.4 billion by CY 2030.<sup>53-54</sup> These collaborative models embedded Indian firms deeper within global pharmaceutical value chains.

**Strategic M&A for Global Integration:** Recognising the need for distribution access and regulatory footholds, Indian firms undertook targeted acquisitions abroad. These moves enabled a local presence in developed markets, improved compliance, and accelerated the adoption of technology. M&A became a channel to bypass tariff or regulatory frictions and integrate vertically into global markets.

**From Disruption to Leadership:** By the early 2010s, India had become the world's largest supplier of affordable generics, responsible for nearly 20 per cent of global supply.<sup>55</sup>

<sup>50</sup> Research, C. F. D. E. A. (2017, November 16). Drug Master Files: Guidelines. U.S. Food and Drug Administration: A Drug Master File is a submission of detailed information of facilities, processes or articles used in manufacturing, processing, packaging and storing of one or more human drugs. This is confidential information usually produced on request of the holder or authority. During the TRIPS crisis, the Indian Pharmaceutical Industry submitted these filings as supportive documents for New Drug Application or Abbreviated New Drug Application to the Food & Drug Administration (FDA) for approval of their pharmaceutical drugs, <https://tinyurl.com/yup7u3fs>.

<sup>51</sup> Research, C. F. D. E. A. (2025, October 3). Abbreviated New Drug Application (ANDA). U.S. Food and Drug Administration: An abbreviated new drug application (ANDA) contains data submitted to the FDA for review and potential approval of a generic drug product, <https://tinyurl.com/hetvt89m>.

<sup>52</sup> Ibid note 47.

<sup>53</sup> Rai, R. K. (2008). Battling with TRIPS: Emerging Firm Strategies of Indian Pharmaceutical Industry Post-TRIPS. In *Journal of Intellectual Property Rights*: Vol. Vol 13 (pp. 301-317), <https://tinyurl.com/mrm6xvhn>.

<sup>54</sup> Department of Pharmaceuticals, Ministry of Chemicals & Fertilisers, & Biovantis Healthcare Private Limited. (2023). Study on CRO Sector in India, <https://tinyurl.com/3j3rc3c8>.

<sup>55</sup> Waning, B., Diedrichsen, E., & Moon, S. (2010). A lifeline to treatment: the role of Indian generic manufacturers in supplying antiretroviral medicines to developing countries. *Journal of the International AIDS Society*, 13, 35, <https://doi.org/10.1186/1758-2652-13-35>.

Export markets diversified, regulatory credibility deepened, and the innovation pipeline expanded. What began as an existential threat evolved into a catalyst for global leadership. This strategic realignment translated into a substantial expansion of India's pharmaceutical exports. Between FY01 and FY25, pharmaceutical exports increased from USD 1.9 billion to USD 30.5 billion in FY25, representing a nearly 16-fold rise driven by market diversification, regulatory alignment, and enhancements in capability.<sup>56,57</sup>

**Lessons for India Inc. in today's tariff environment:** Regulatory capacity, diversified markets, and upgraded capabilities transformed a vulnerable sector into a global powerhouse. Rather than being diminished by TRIPS, the sector repositioned itself at the higher end of the pharmaceutical value chain. This sector's rebound from the TRIPS crisis is a clear demonstration of how external shocks can be turned into opportunities through strategic action. In the current situation of an unpredictable global tariff regime, India Inc. can draw inspiration from the pharmaceutical sector to capitalise on this situation to its advantage. India Inc. must focus on capability building through strong R&D, Market diversification to reduce dependence on a single market and build resilience, and partnership-driven models such as co-development, licensing, and contract manufacturing to help reduce risk. Additionally, strategic consolidation is necessary to expand in capital- and compliance-heavy environments.

4.51 To sustain the momentum in India's trade performance amidst global uncertainty, the country is actively pursuing a diversified trade strategy. This includes the recently concluded India-UK Comprehensive Economic and Trade Agreement (CETA) and the India-Oman Comprehensive Economic and Partnership Agreement (CEPA), as well as engagements in free-trade agreement (FTA) negotiations with the US, Chile, and Peru. The negotiations of an FTA with New Zealand were concluded in December 2025.<sup>58</sup> Furthermore, the India-Oman CEPA, signed on 18 December 2025, provides the country with market access for goods and services in the Middle East and Africa. The agreement facilitates duty-free access for 99.38 per cent of India's exports, with the immediate elimination of tariffs on 97.96 per cent of tariff lines. This includes comprehensive tariff elimination for all major labour-intensive sectors in India. Additionally, India has offered tariff liberalisation on 94.81 per cent of its imports from Oman. The service sector is also poised to benefit significantly, as the agreement establishes an enhanced mobility framework for Indian professionals. Oman has made substantial commitments across a wide range of sectors, including computer-related services, business and professional services, audio-visual services, research and development, education, and health services.<sup>59</sup>

<sup>56</sup> Kallummal, M., & Bugalya, K. (2012, August). Trends in India's trade in pharmaceutical sector: Some insights (CWS/WP/200/2). Centre for WTO Studies, Indian Institute of Foreign Trade, <https://tinyurl.com/kpyvr6mu>.

<sup>57</sup> PIB Press release of the Ministry of Commerce and Industry dated 17 December 2025: <https://tinyurl.com/5c7kek2h> and PIB Press release of the Department of Chemicals and Petrochemicals dated 28 December 2001: <https://tinyurl.com/ywpwh7pj>. In 2000-01, pharmaceutical exports were valued at ₹872989 lakhs. Based on INR's financial year annual average exchange rate of 45.684, it translates to USD 1.9 billion.

<sup>58</sup> PIB Press release of the Ministry of Commerce dated 22 December 2025, <https://tinyurl.com/2bpnr5dm>.

<sup>59</sup> PIB Press release dated 18 December 2025, <https://tinyurl.com/3kjp7e5r>.

4.52 An expanding network of FTAs supports India's trade strategy by offering reliable market access amid global uncertainty. These agreements enable export-focused firms to boost production and become more integrated into GVC. Furthermore, by exposing firms to international competition, FTAs improve export competitiveness, encouraging firms to prioritise productivity and reliability over reliance on access-based benefits. In this context, enhancements in export competitiveness increasingly depend on state-level implementation, as states play a vital role in providing the infrastructure, regulatory certainty, and administrative coordination that export-focused firms need.

4.53 To enable the exporters to leverage the benefits of FTAs and preferential trade agreements, the tariff explorer service on the Trade Connect ePlatform provides information on tariff concessions available to eligible exports from the country. Furthermore, the Export Promotion Mission (EPM) establishes a comprehensive, flexible, and digitally driven framework for enhancing export initiatives. This approach signifies a strategic transition from numerous fragmented schemes to a unified, outcome-oriented mechanism capable of promptly responding to global trade challenges and the evolving needs of exporters.<sup>60</sup> The government has also implemented the Credit Guarantee Scheme for Exporters to provide additional financial assistance to Indian exporters during periods of uncertainty, thereby ensuring liquidity, promoting business continuity, and creating opportunities to expand into new markets.<sup>61</sup>

4.54 The EPM's effectiveness is further reinforced by complementary steps announced by the Reserve Bank of India that aim at mitigating debt-servicing stress and promoting the continuity of viable export-oriented businesses. These include a moratorium/deferment on payments of all instalments (principal and/or interest) for eligible borrowers to be extended by the regulated entities (RE), an extension of tenor for export credit by an eligible RE for a period of up to 450 days for pre-shipment and post-shipment export credit disbursed till 31 March 2026. To maintain liquidity, REs may recalculate their drawing power by reducing margins or reassessing working capital limits. Under the Foreign Exchange Management (Export of Goods and Services) (Second Amendment) Regulations, 2025, the period for realisation and repatriation of export proceeds has been extended from nine months to 15 months, and the shipment period against advance payments has been increased from one year to three years.<sup>62</sup>

4.55 Together, these regulatory and fiscal measures provide an integrated framework of support to exporters, maintaining liquidity, protecting credit discipline and aligning with the EPM's goal of an enhanced export ecosystem.

<sup>60</sup> PIB press release of the Ministry of Commerce and Industry, dated 12 November 2025, <https://tinyurl.com/6s89xv6p>.

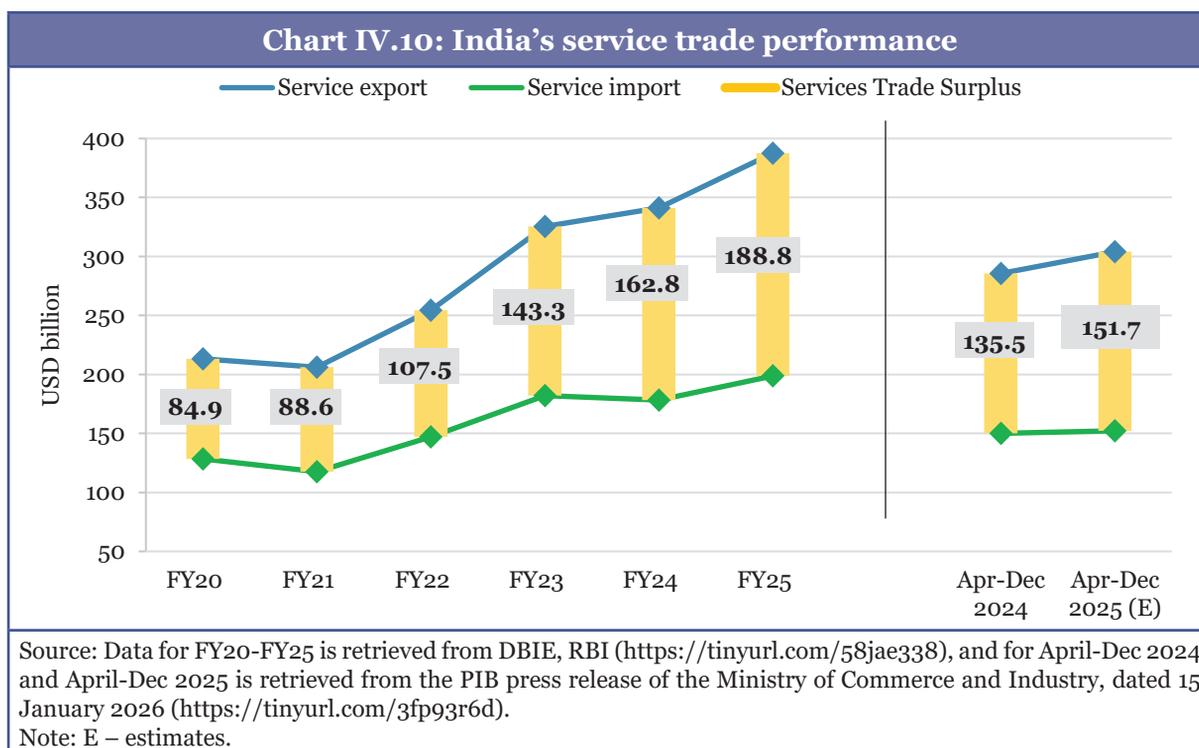
<sup>61</sup> PIB press release of the Ministry of Finance, dated 01 January 2025, <https://tinyurl.com/4dave8bd>.

<sup>62</sup> Reserve Bank of India (Trade Relief Measures) Directions, 2025, dated 14 November 2025, <https://tinyurl.com/2rx5cb7b>.

## Services trade

4.56 India's services trade plays a crucial role in enhancing the country's overall trade performance. This sector has shown resilience amid global economic volatility, as evidenced by its consistent growth in exports.

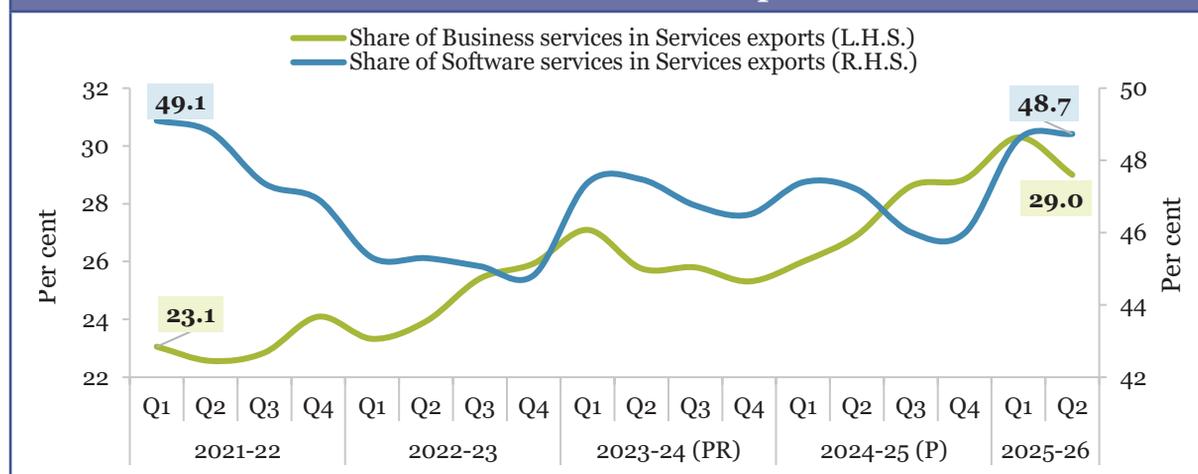
4.57 In FY25, services exports reached an all-time high of USD 387.5 billion, registering a robust 13.6 per cent (YoY) growth and reinforcing India's position as a global hub for technology, business, and professional services. At the same time, services imports registered a growth of 11.4 per cent (YoY) and amounted to USD 198.7 billion. The growth in imports is indicative of growing cross-border demand for business and financial services. As a result, in FY25, the services trade surplus increased to USD 188.8 billion, reaching the highest level ever recorded. Effectively, the surplus in services trade covered two-thirds of the merchandise trade deficit.



4.58 Services trade remains strong in FY26, with exports increasing by 6.5 per cent to USD 304.0 billion and imports increasing by 1.5 per cent to USD 152.2 billion in April-December 2025. The services trade surplus amounted to USD 151.7 billion, accounting for 61.1 per cent of the merchandise deficit, highlighting the resilience of the software, BPM, consulting, and fintech sectors. Software services exports have historically been the largest part of the country's overall service exports, with business services exports increasing recently (Chart IV.11). This growth is due to the country's success as a global hub for Global Capability Centres (GCCs), which grew at a 7 per cent CAGR from FY20 to FY25. Key drivers include talent availability and diversity. According to Stanford's

AI Index Report 2025, the country is second globally in AI skill penetration with a score of 2.5, just behind the US at 2.6.<sup>63,64</sup> Its strong physical and digital infrastructure, combined with labour arbitrage, SEZ-based GCCs benefiting from tax holidays, and a vibrant startup ecosystem, bolster its cost competitiveness and efficiency.<sup>65</sup> Chapter 9 of the Economic Survey discusses the rising role of GCCs in the economy.

**Chart IV.11: Share of business and software service exports in India's total service exports**



Source: DBIE, RBI (<https://tinyurl.com/58jae338>).

Note: PR – partially revised, P – provisional.

4.59 The RBI's survey on computer software and information technology-enabled services (ITES) shows that software services exports have increased by 7.3 per cent (YoY) in FY25, following an increase of 2.3 per cent (YoY) in FY24. In FY25, computer services exports account for over two-thirds of India's total software service exports, while BPO services remain the most significant component of ITES exports. Furthermore, while the US remains the largest destination for software exports from India, its share has decreased from 54.1 per cent to 52.9 per cent between FY24 and FY25. Concomitantly, Europe's share has increased from 30.8 per cent to 32.8 per cent during the same period.<sup>66,67</sup>

63 Stanford University. (2025). Artificial Intelligence Index Report 2025, <https://tinyurl.com/4sstmw7y>.

64 Maslej, N., et al. (2025). The AI Index 2025 annual report. AI Index Steering Committee, Institute for Human-Centred AI, Stanford University, <https://doi.org/10.48550/arXiv.2504.07139>.

65 Confederation of Indian Industries. (2025). Global Capability Centres: Suggestions for a national framework on GCCs - Unlocking potential as the preferred destination for GCCs, <https://tinyurl.com/4kz4azv4>.

66 RBI's Survey on Computer Software and Information Technology Enabled Services Exports: 2024-25, <https://tinyurl.com/38s59zu4>.

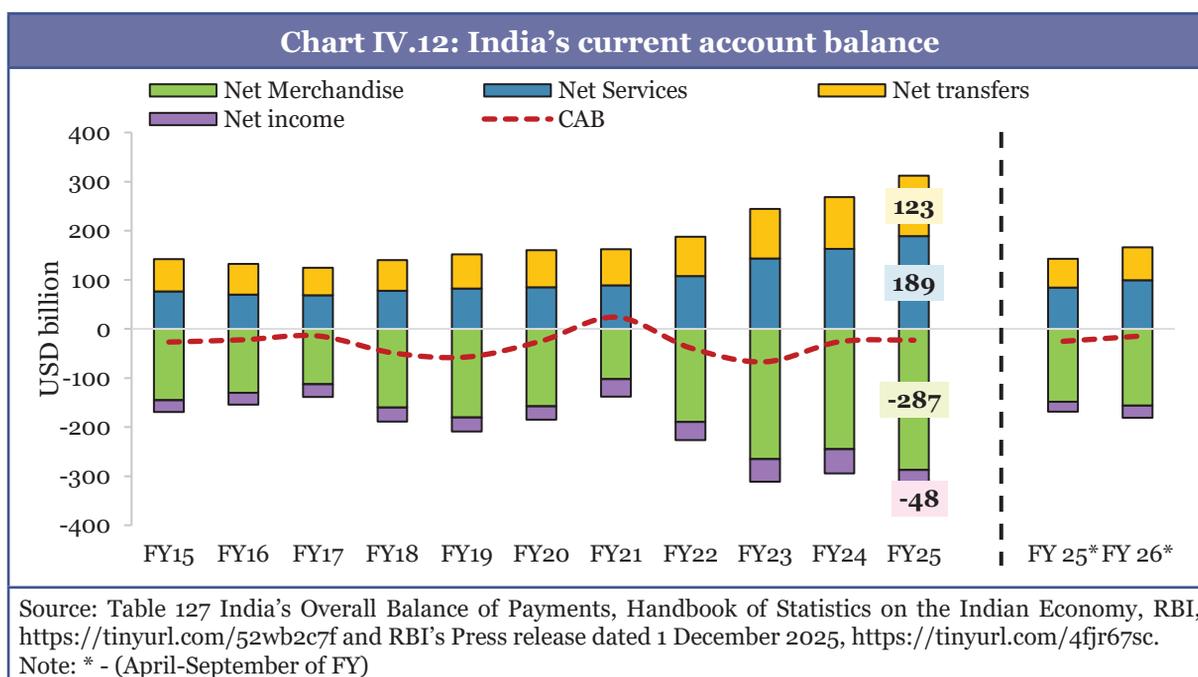
67 RBI's Survey on Computer Software and Information Technology Enabled Services Exports: 2023-24, <https://tinyurl.com/ynaww7mb>.

## INDIA'S BALANCE OF PAYMENTS

4.60 The Balance of Payments (BoP) statement provides a consolidated record of India's transactions with the rest of the world, capturing developments in the current account and capital account and offering a comprehensive view of the economy's external sector.

### Developments in the current account

4.61 India's current account structure reflects a merchandise trade deficit offset by strong net inflows of invisibles, led by rising surpluses in services and private transfers (Chart IV.12). The services surplus has expanded steadily, driven by India's growing role in global IT, business, and professional services. Remittance inflows have also increased consistently, providing a stable, counter-cyclical buffer. These components have collectively kept the current account deficit (CAD) within manageable levels. In H1 FY26, the CAD moderated to USD 15 billion (0.8 per cent of GDP) from USD 25.3 billion (1.3 per cent of GDP) in H1 FY25.

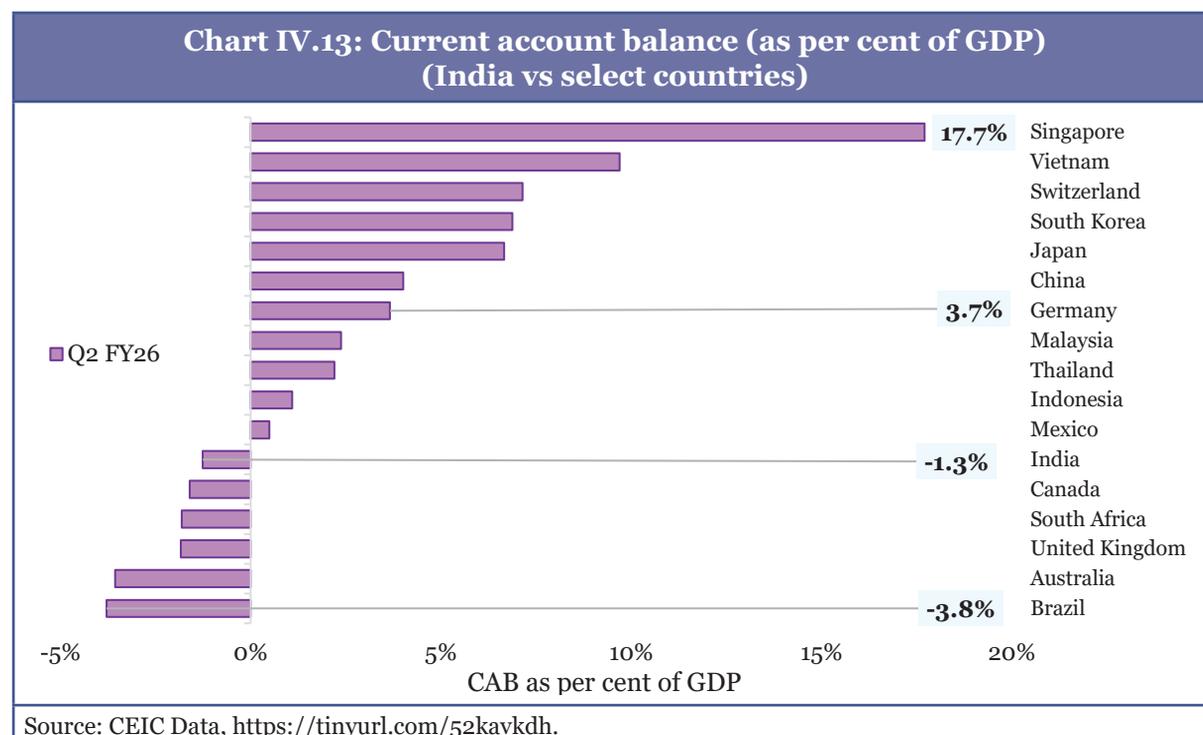


4.62 Countries with sizeable current account surpluses tend to be export-driven, while deficits are common in import-heavy economies. Major surplus economies such as Singapore and Germany run substantial trade surpluses in high-value manufacturing and related sectors.<sup>68,69</sup> Comparing India's CAD with that of other countries in Q2 FY26, India's modest deficit of about 1.3 per cent of GDP places it among economies with modest and sustainable deficits. It is better positioned than its high-deficit peers, such

<sup>68</sup> Singapore Department of Statistics, <https://tinyurl.com/3cbc4rn2>.

<sup>69</sup> Deutsche Bundesbank Euro system, <https://tinyurl.com/ypp47v2a>.

as New Zealand (-7.7 per cent), Brazil (-3.8 per cent), Australia (-3.6 per cent), the UK (-1.8 per cent), and Canada (-1.6 per cent).



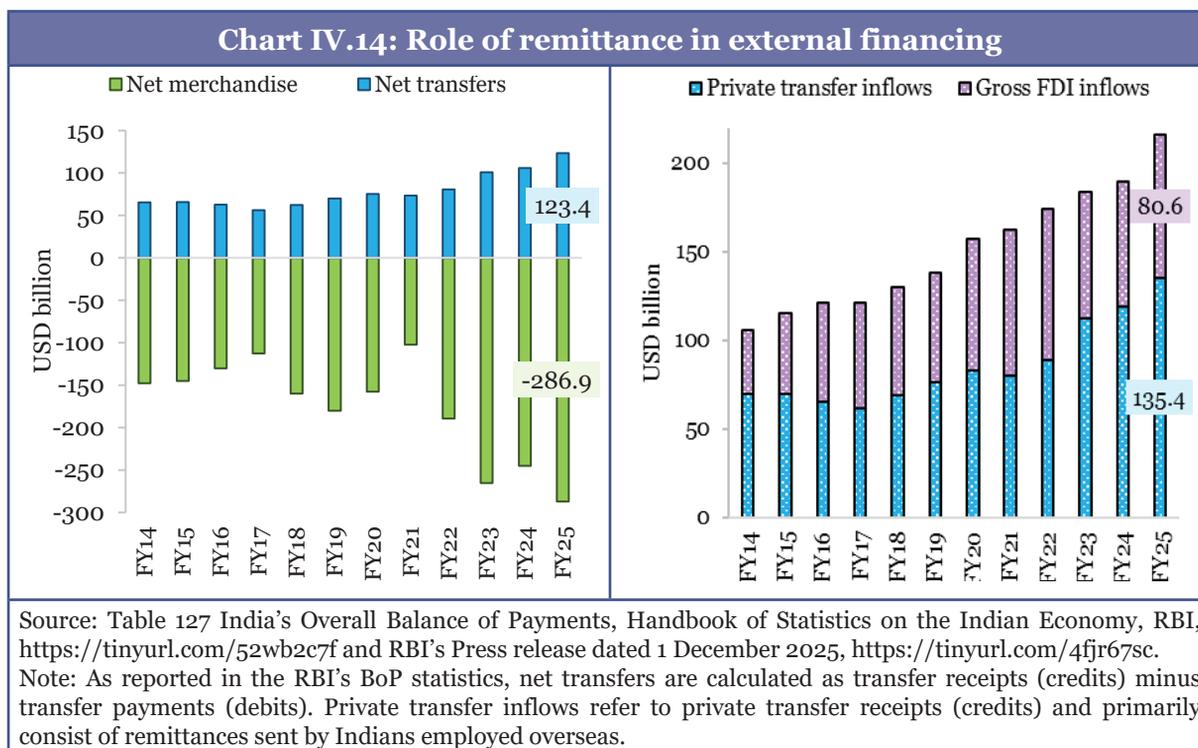
## Remittances

4.63 Private transfer receipts, mainly representing remittances by Indians employed overseas, remained a key source of external-sector strength in FY26. Remittances increased to USD 73 billion in H1 FY26, up from USD 64.7 billion in the same period the previous year.<sup>70</sup>

4.64 This near-term performance is consistent with India's longer-term position as the world's largest recipient of remittances. The latest available data indicate that remittance inflows increased steadily from USD 55.6 billion in FY11 to USD 135.4 billion (provisional) in FY25, accounting for approximately 3.5 per cent of GDP in FY25 (provisional). Correspondingly, net transfers<sup>71</sup> have financed a substantial portion of the merchandise trade deficit during this period. Furthermore, in most years, remittances (private transfer receipts) have surpassed gross FDI inflows, highlighting their importance as a dependable source of external funding (Chart IV.14).

<sup>70</sup> Remittances are proxied by private transfer inflows, which denote total private transfer credits in the BoP statistics.

<sup>71</sup> Defined as the difference between total (private and official) transfer receipts and transfer payments



4.65 Against this backdrop of sustained and rising remittance inflows, the RBI's sixth round of the Survey on Remittances for FY24 reveals notable shifts in remittance composition, geography and mode of remittance. While Gulf Cooperation Council countries have historically dominated India's inward remittances, AEs now contribute more, indicating a shift towards skilled and professional workers. The US is the top contributor with 27.7 per cent, followed by the UAE (19.2 per cent), the UK (10.8 per cent), and Singapore (6.6 per cent).

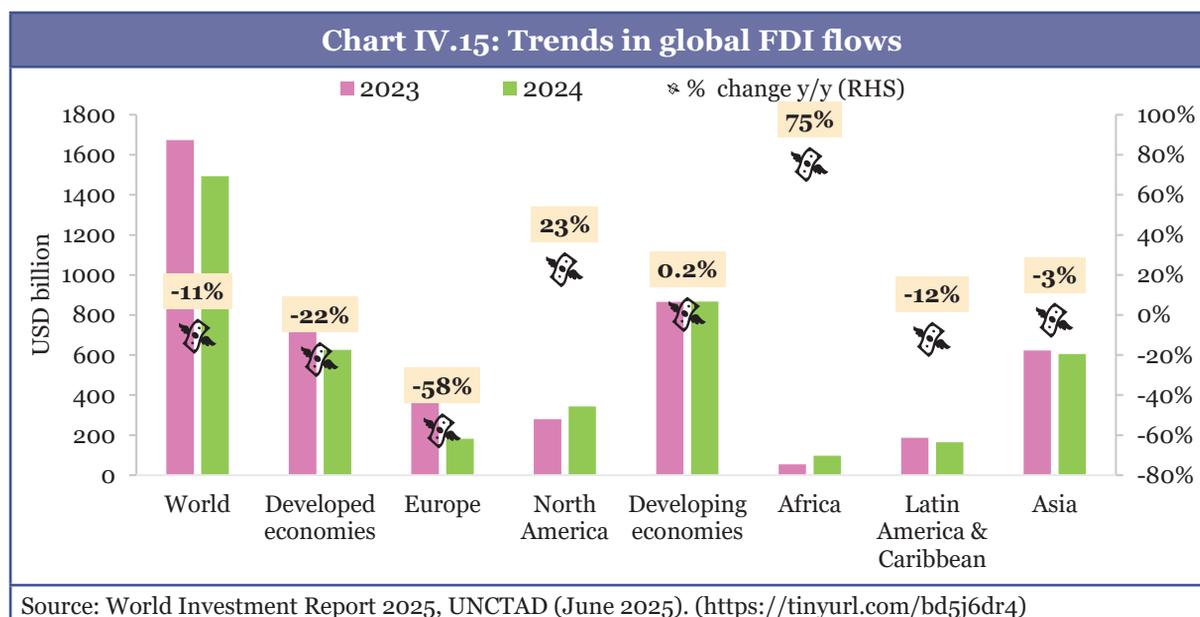
## Capital account development

4.66 The capital account records how India interacts with global financial markets through cross-border investments, external borrowings and other capital transactions and is central to understanding how the economy finances its current account needs. Developments in this account also signal the degree of confidence global investors place in India's growth outlook, as countries with stronger macro fundamentals typically attract more stable and longer-term capital. In recent years, India's capital account dynamics have been shaped by a combination of resilient FDI inflows, periodic swings in portfolio investment and shifts in external commercial borrowing in response to global interest-rate cycles.

## Global trends in foreign direct investment flows

4.67 An assessment of India's FDI flows needs to be placed in the context of broader global investment trends. The global FDI landscape has remained subdued through CY

2024 and into the first half of CY 2025, extending the weakness that has characterised international investment flows in recent years.<sup>72</sup> According to the latest UNCTAD's World Investment Report 2025, global FDI inflows declined by 11 per cent (YoY) in CY 2024, marking the second consecutive year of contraction (excluding European conduit economies).<sup>73</sup> The downturn was driven by a 58 per cent fall in FDI to Europe and a 29 per cent decline in China.



4.68 Despite tighter financing conditions and heightened geopolitical uncertainty, FDI inflows to developing economies remained broadly stable at USD 867 billion (57 per cent of global FDI) in CY 2024. Asia continued to be the largest recipient region, although it recorded a modest 3 per cent decline in inflows in CY 2024.

4.69 Preliminary data for H1 2025 shows a further 3 per cent decline in global FDI inflows compared to H1 2024. Net cross-border mergers and acquisitions, which generally reflect immediate shifts in corporate strategy, dropped sharply by 23 per cent, while the number of greenfield project announcements, an indicator of new capacity creation, decreased by 17 per cent in the same period in H1 2025 compared with H1 2024. However, the overall picture is not uniformly negative. The total value of greenfield announcements increased by 7 per cent in H1 2025, driven by significant investments in the digital and AI-related sectors. This dichotomy between the number and value of projects was due to large-scale announcements in semiconductors and

<sup>72</sup> UNCTAD Global Investment Trend Monitor, October 2025: <https://tinyurl.com/42dxk27d>.

<sup>73</sup> FDI flows are inflated by volatile flows through conduit economies. Excluding those, FDI flows fell by 11 per cent in CY 2024. Several European economies, including Ireland, Luxembourg, the Netherlands and Switzerland, where FDI statistics are significantly affected by conduit financial flows, reported large fluctuations and negative numbers in 2023 and 2024. Fewer negative numbers in 2024 exerted a net positive effect on global flows of about USD 230 billion.

data centres in developed countries,<sup>74</sup> underscoring the increasing concentration of global capital in technology-intensive sectors.<sup>75</sup>

4.70 International project finance, which is central to infrastructure investment in developing economies, also experienced a contraction, with its total value declining by 8 per cent in H1 2025, continuing the downward trajectory observed in CY 2023 and CY 2024. This weakness was more pronounced in renewable energy and power, reflecting the impact of higher global interest rates that have raised the cost of capital for long-gestation projects.

4.71 FDI inflows to developed countries (excluding European conduit economies) declined by 7 per cent in the H1 of 2025. The number of greenfield project announcements in these nations fell by 20 per cent over the same period, primarily driven by decreases in manufacturing sectors reliant on supply chains. The US remained a notable exception, supported by substantial commitments in the AI and semiconductor sectors. Taken together, these trends indicate a shift in global investment flows away from capital-intensive, long-gestation infrastructure projects towards shorter-cycle, technology-driven investments.

## Trends in investment flows into India

4.72 Cross-border financial flows, which include flows in securities (e.g., stocks and bonds) and in FDI, are an important mechanism of India's integration with global capital markets. India has consistently attracted sizeable gross investment inflows, amounting to 18.5 per cent of GDP in FY25 and 16.9 per cent in H1 FY26, even amid tightening global financial conditions.<sup>76</sup>

4.73 According to UNCTAD data, while India recorded a marginal decline of 2 per cent in FDI inflows in CY 2024, it remained the largest recipient of gross inflows in South Asia and surpassed major Asian peers such as Indonesia and Vietnam. The decline was relatively modest when viewed against the sharp contractions experienced by several large emerging markets.

4.74 This resilience is also evident in greenfield investment activity, which provides a forward-looking signal of global investor sentiment. India ranked fourth globally in CY 2024, with 1,080 announced greenfield projects, and has emerged as the largest destination for greenfield digital investments between CY 2020 and CY 2024,

---

<sup>74</sup> The number of greenfield announcements fell by 12 per cent, while the total project value dropped by 37 per cent in developing countries.

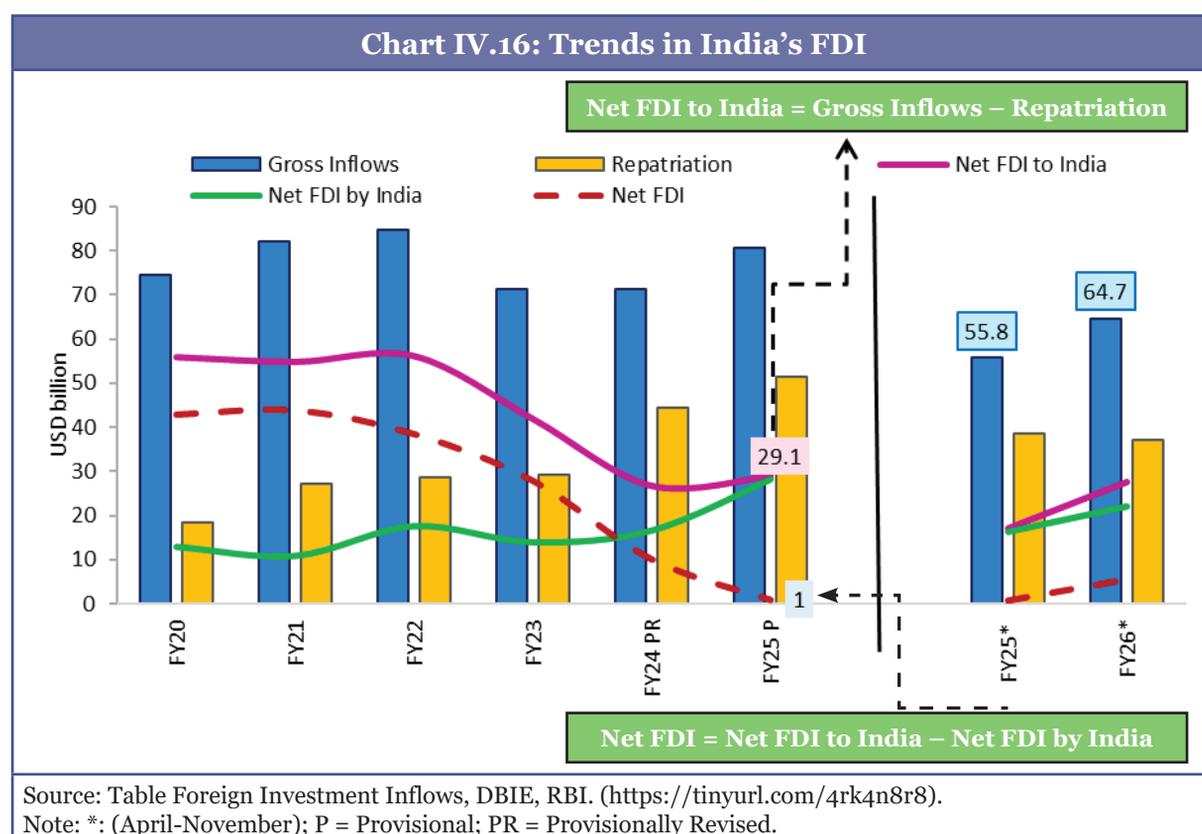
<sup>75</sup> Ibid note 72.

<sup>76</sup> Gross investment inflows refer to credit-side foreign investment flows, comprising gross FDI and FPI inflows, as reported in RBI's BoP statistics.

attracting USD 114 billion. This is well ahead of Malaysia (USD 74 billion), Singapore (USD 39 billion), Vietnam (USD 32 billion), Mexico (USD 29 billion), and China (USD 24 billion).<sup>77</sup> Notably, India attracted investments across various categories, including digital services, data centres, and IT infrastructure.

4.75 According to RBI data, in FY25, gross FDI inflows into India stood at USD 81.0 billion, representing a 13 per cent increase from USD 71.3 billion in FY24<sup>78</sup>. Of these gross FDI inflows, equity inflows accounted for USD 51 billion, and approximately 60 per cent of these flows were directed towards services, computer software and hardware, trading, non-conventional energy, construction, and the automobile sector.<sup>79</sup>

4.76 In April-November 2025, gross FDI inflows strengthened further to USD 64.7 billion, compared with USD 55.8 billion in April-November 2024. The magnitude of inflows during the first eight months of the year highlights sustained investor confidence despite a subdued global environment and reflects the underlying strength of India's digital economy, as well as the continued policy emphasis on manufacturing and infrastructure.



<sup>77</sup> UNCTAD's World Investment Report, 2025: <https://tinyurl.com/28zfatdw>

<sup>78</sup> RBI Bulletin (December 2025): <https://tinyurl.com/4b7y7zc7>

<sup>79</sup> Factsheet on FDI Inflow, DPIIT: <https://tinyurl.com/38vfrd49>

4.77 FDI outflows from India increased to USD 22.1 billion during April-November 2025. Despite this, improvements in gross inflows along with a moderation in profit repatriation by foreign investors led to a strengthening of net FDI. Net FDI increased nearly sevenfold to USD 5.6 billion during April-November 2025, up from USD 0.8 billion in the same period a year earlier.

4.78 It is important to examine the return on inward FDI, while there is a recent slowdown in net FDI, which would indicate the profitability of the investments. Box IV.2 presents evidence on India's inward FDI returns, providing a useful complement to the analysis of gross and net inflows.

#### Box IV.2: Returns on inward Foreign Direct Investment

Returns on inward FDI are estimated as FDI equity income receipts expressed as a percentage of the total inward FDI stock.<sup>80</sup> This indicator provides information on the profitability of direct investment enterprises. For example, when the rate of return on inward FDI increases, it implies that resident direct investment enterprises are more profitable and more competitive for investors.

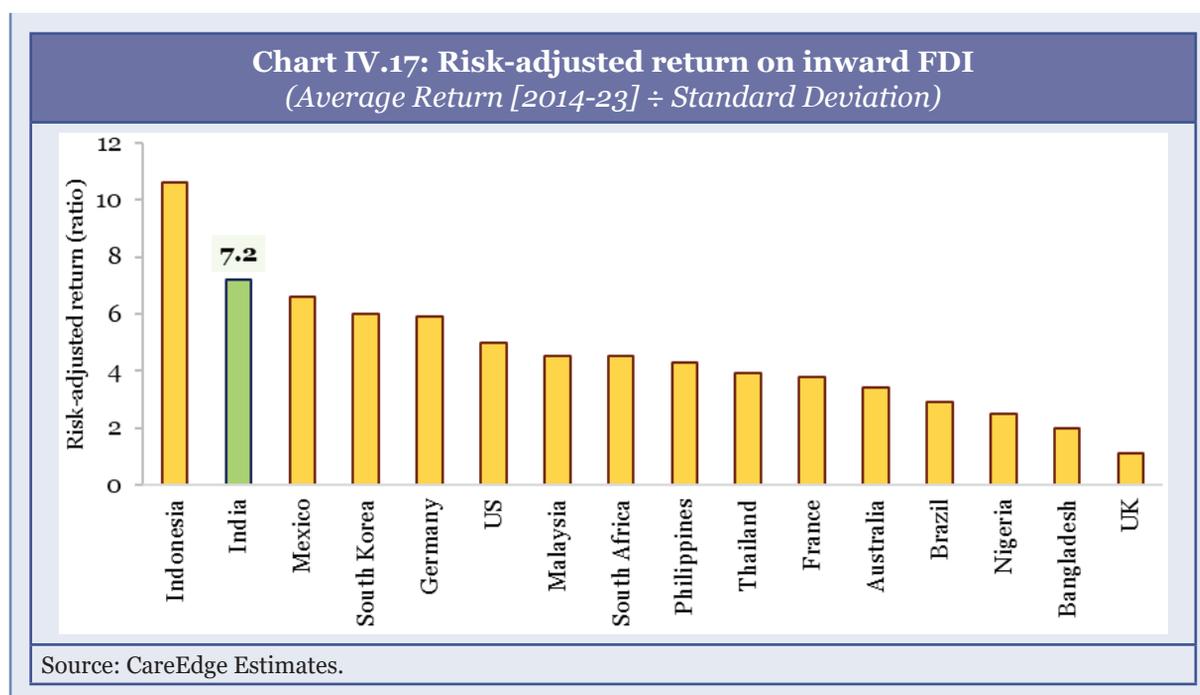
To account for the lag between investment and income generation, the inward FDI stock is measured with a two-year lag, recognising that returns typically materialise after an initial gestation period. This is particularly relevant given the multi-year gestation periods typical of investments in manufacturing, infrastructure and digital services. Accordingly, annual returns on inward FDI are computed as:

$$\text{FDI Return}_t = \frac{\text{Direct Investment Income}_t}{\text{Inward FDI Stock}_{t-2}}$$

Using this approach, CareEdge analysis<sup>81</sup> for 2014-2023 shows that India's average return on inward FDI is approximately 7.3 per cent, higher than that of some major emerging economies, such as Thailand (7 per cent), Brazil (6.1 per cent), Mexico (4.3 per cent), and South Africa (4.3 per cent). It is also higher than that of some AEs, such as France (3.6 per cent), Germany (3.0 per cent), the US (2.9 per cent), and the UK (2.2 per cent).

This analysis is further extended to compute the risk-adjusted return, defined as the ratio of the 10-year average return to its standard deviation. India ranks second only to Indonesia among the major economies examined, with a ratio above 7, compared with around 5 or lower for several large AEs. This combination of higher returns and comparatively low volatility underscores India's positioning as a destination offering reasonable yield without exposing investors to extreme earnings swings. The average FDI returns in India remain attractive.

<sup>80</sup> OECD Methodology: <https://tinyurl.com/4652bhy5> and Eurostat's Methodology: <https://tinyurl.com/y4mrx6ey>  
<sup>81</sup> CareEdge Ratings Analysis (December, 2025): <https://tinyurl.com/bddpjnta>



4.79 Net FDI, which has traditionally been driven by fluctuations in gross inflows, has also reflected the impact of repatriation and Overseas Direct Investment (ODI) by Indian firms in recent times. While these outflows mechanically reduce net FDI, they align with the growing internationalisation of Indian enterprises as they expand their business presence abroad, enabling them to compete in the global market and strengthening the Indian economy in the long term. Furthermore, the rising trend of repatriation suggests that India is not only attracting foreign capital but also delivering strong returns, which enhances its reputation as a reliable investment destination.

4.80 Going forward, the challenge is to sustain FDI inflows in an environment of heightened global volatility, which underscores the need for a multi-pronged strategy that strengthens the investment climate by addressing both structural and cyclical factors that determine capital flows. Box IV.3 discusses this challenge and suggests a way forward.

### Box IV.3: India's FDI Challenge: Turning success into sustainable growth

EMDEs, including Indonesia, Mexico, Poland, Morocco, and Vietnam, have effectively leveraged the trade and investment reorientation strategies employed by China and the US. By positioning themselves as connector countries,<sup>82</sup> these nations have reaped the benefits of FDI, driven by tariff avoidance and the intent to serve as export platforms. Connector countries serve as a base for multinational enterprises that establish production in the host

<sup>82</sup> "Connector countries" are geopolitically aligned countries or those that satisfy the criteria for political stability, regulatory quality, and other structural factors conducive to investment. They serve as conduits in trade and investment flows between geopolitical blocs.

country primarily to export goods or services to other markets, rather than mainly catering to the domestic market.<sup>83</sup>

Countries have also been attracting FDI through a mix of policies and incentives, with the latter being used to stimulate investments in strategic sectors. For example, Vietnam has been able to attract greater FDI by leveraging corporate tax rate reductions for investors, well-developed industrial zones, and a deep network of FTAs. Its geographic proximity to East Asia’s top emerging economies and business-friendly policies make it a preferable host for investments.<sup>84</sup> Vietnam has introduced a policy to accelerate investment project approvals, “Decree 19”, which establishes a special investment procedure that drastically streamlines the investment licensing process, aiming to attract high-quality capital, particularly in high-tech industries.<sup>85</sup> To attract investment into strategic sectors like artificial intelligence and semiconductors, Vietnam, Brazil, and Chile have been incentivising investment in research and development centres.<sup>86</sup>

Malaysia undertook the facilitation route to attract investments by launching a ‘Golden Pass’ scheme to attract unicorn start-ups and venture capitalists, streamlining visa, employment, and licensing procedures.<sup>87</sup> Similarly, the Philippines has enacted the ‘Create More Act’, which empowers the Investment Promotion Agency to issue special visas to foreign nationals possessing highly specialised skills or occupying executive roles. These efforts collectively contribute to the favourable investment climate in these regions.<sup>88</sup>

Another model through which many countries have successfully attracted foreign investment involves the establishment of structures headed by higher levels of government. Some examples are detailed in the table below.<sup>89</sup>:

Country	Institutional structure to attract FDI	Tools/Measures
Vietnam	Foreign Investment Agency and Special Working Group headed by the Minister for investment promotion and attracting multinational manufacturing projects  Prime Minister (PM) level meetings and monitoring of investments	Tax holidays; customs exemptions; industrial park preparedness; land access; proactively courting investments; roadshows to headquarters

83 Bloomberg. (2023, November 1). These five countries are key economic ‘connectors’ in a fragmenting world, <https://tinyurl.com/42d5myev>.

84 Dezan Shira and Associates, Doing Business in Vietnam, accessed on 09 December 2025, <https://tinyurl.com/46emvss2>.

85 Government of Vietnam, Decree No. 19/2025/ND-CP, dated 10 February 2025, <https://tinyurl.com/54rzw6k3>.

86 Ibid note 77.

87 Government of Malaysia, keynote address by the Hon’ble Rafizi Ramli, Minister of Economy at KL20 Summit 2024, <https://tinyurl.com/yr6uw3bb>.

88 2025 Investment Climate Statements: Philippines, <https://tinyurl.com/48akrxaj>.

89 Ministry of Planning and Investment of the Socialist Republic of Vietnam: <https://tinyurl.com/yaexy2hm>, Malaysia Investment Development Authority: <https://tinyurl.com/4btnp925>, Thailand Board of Investment – Investment Promotion Guide 2025: <https://tinyurl.com/epbt9n6m>, InvesTaiwan: <https://tinyurl.com/y3t2rjtt>, Australian Government – Department of Foreign Affairs and Trade: <https://tinyurl.com/32ukcazu>.

Malaysia	Malaysian Investment Development Authority, chaired by Minister/senior industrialist National Committee on Investment PM chairs National Investment Council	Investment missions; tailor-made tax incentives; more extended tax holidays up to 10 years; short-term special incentives; entry facilitation for businesses
Thailand	Board of Investment; Eastern Economic Corridor initiative (chaired by the PM) Special task force in high-tech industries Quasi-regulatory authority for the grant of incentives	Tax cuts- personal, corporate; import exemptions; largest project approvals by the Board chaired by the PM
Taiwan	InvesTaiwan initiative; focus on high-value manufacturing; Single-window service centre for investors	Low-interest loans, tax breaks and subsidies, simplified tax procedures
Australia	Global business and talent attraction taskforce Cross-agency task force PM level monitoring	Visa concessions, R&D tax incentives, and fast-tracked project approvals; permanent residency to highly skilled individuals in target sectors

A common thread running across these senior empowered structures is their authority to negotiate investment deals using incentives. India's task to attract FDI is even more complex, as it is not just competing with the world's current largest exporter for shifting GVCs to India, but also with emerging FDI destinations (as per the Table above), which have already been wooing investors with interventions at the PM level.

India has what it takes to attract FDI, given that institutions like Invest India are already in place. However, the integration of efforts, culminating in a structure led by the highest levels of the government with robust Centre-State coordination, is what would make large investors believe in our intention to host them. Furthermore, a strategic approach to identifying priority sectors, along with a mix of incentives and reforms, will help prevent the dilution of policy efforts and improve overall effectiveness.

### Challenges and way forward

Global surveys show that political stability and strong macroeconomic fundamentals are key drivers of FDI. India excels in this area but could better leverage its strengths. Despite a clear government intent and proven economic management, FDI inflows remain below their potential, especially for infrastructure needs. Proactive reforms are essential to attract more foreign investment.

This approach involves developing a targeted strategy that identifies a specific set of GVC anchors and establishes a state apparatus that collaborates directly with them as partners. The direct engagement will help resolve cross-agency issues and provide customised and time-bound solutions. Additionally, it is crucial for India not only to offer compelling incentives but also to ensure these incentives are reliably implemented. This strategy will

help mitigate execution risks for involved firms, fostering a more stable and attractive investment environment. Establishing a single, empowered centre of accountability will position India as a credible alternative production hub capable of handling large volumes, integrating with global suppliers, meeting regulatory and compliance standards, and, importantly, providing predictability over a multi-year timeframe.

Creating a task force to engage top global companies and promote India's advantages - stability, macroeconomic strength, sustained growth and market size - could boost FDI, especially in targeted sectors. Proactive diplomacy, highlighting these strengths, can help offset tariff challenges.

Efforts to improve the investment environment by simplifying processes and procedures to attract FDI will need to be kept up.<sup>90</sup> As foreign investors prioritise predictability and sustainability in policies, every policy change in the country must pass the necessity test to meet both these parameters.

Further enhancements are required on the regulatory environment front, as well as improvements in logistics and workforce development. The World Bank's Logistics Performance Index, for example, placed India at 38th position in 2023.<sup>91</sup> While on the one hand, these gaps indicate how far India is from achieving the world's best in terms of logistics, they also open doors to vast improvement opportunities that could yield substantial returns in terms of FDI.

The momentum created by improvements in the investment climate, streamlined regulations, and reduced bureaucratic procedures, thereby enhancing the ease of doing business, must be sustained and accelerated. India's credit rating upgrades can be leveraged for additional momentum, as foreign investment and sovereign ratings demonstrate a strong historical correlation globally. India's continued economic resilience, steadfast commitment to fiscal consolidation, and reform trajectory position it well for unlocking investor interest.

On bilateral initiatives, the signing of the Bilateral Investment Treaty between India and Israel, along with the binding commitment of USD 100 billion in investment under the India-European Free Trade Association (EFTA) Trade and Economic Partnership Agreement (TEPA), bodes well for India's FDI inflows, provided these agreements are effectively implemented. This along with the signing of the India-UK Comprehensive Economic and Trade Agreement, have the potential to increase FDI inflows.<sup>92</sup> While it is essential to recognise the role of trade and investment agreements as enablers, there is a pressing need for action across departments and agencies to streamline India's trade policy and secure a greater role in GVCs.

Companies harvest profits from established operations in India while hesitating to commit fresh capital amid global uncertainty. The solution lies in mobilising new investment through policy stability, aggressive investor engagement, and scaling proven state-level models nationwide.

<sup>90</sup> WTO. (2023, December 21). Statement By India on Agenda Item 18, General Council Meeting 13-15 December 2023. WT/GC/262, <https://tinyurl.com/2fbwbjh3>.

<sup>91</sup> World Bank's Logistics Performance Index, <https://tinyurl.com/bdfr8a5z>.

<sup>92</sup> PIB press release India-EFTA Trade Pact: Boosting USD 100 billion investment and 1 million jobs, dated 11 October 2025, <https://tinyurl.com/23m4ezv7>.

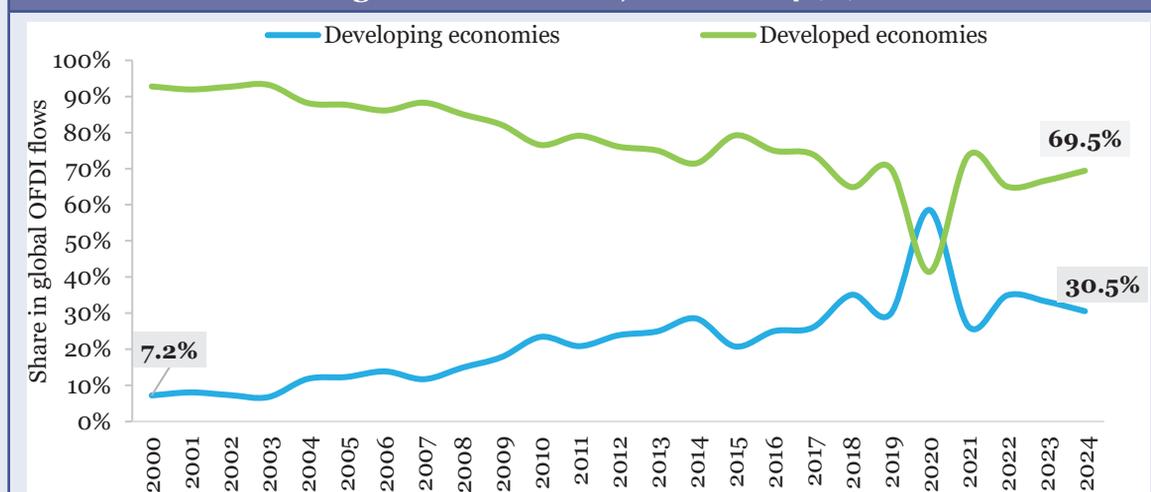
India's fundamentals, such as strong growth, expanding markets, and a demographic dividend, remain compelling magnets for investment, yet FDI strategies must become bolder and offer the best to global investors. The window for action is still open, but it will not remain so indefinitely. There is a need to move decisively to transform the FDI challenge into the next chapter of our economic growth story.

4.81 As India deepens its integration with GVCs, outward investment has emerged as an important complement to inward FDI in shaping India's external sector. The steady rise in ODI reflects the growing competitiveness of Indian firms, their efforts to secure technology, markets, and resources abroad and the enabling effect of the liberalised ODI framework introduced in 2022. These trends underscore a structural shift to an economy whose enterprises are increasingly engaging in global expansion.<sup>93</sup> Box IV.4 examines the evolving contours of India's ODI and its implications for long-term growth.

#### BOX IV.4: Impact of Outward FDI on the home country

International investment flows reflect growing economic integration, with inward FDI signalling investor confidence and outward FDI reflecting the internationalisation and competitiveness of domestic firms. In recent decades, developing economies have become increasingly prominent sources of outward FDI (OFDI), with their share in global FDI outflows rising from nearly 7 per cent in 2000 to close to 30 per cent by 2024, signifying the internationalisation of enterprises from traditionally capital-scarce regions.

**Chart IV.18: Share of developed & developing economies in global OFDI flows, 2000-2024 (%)**



Source: UNCTAD Stat database, <https://tinyurl.com/2atc2u4>.

For India, where capital formation needs remain substantial, a key policy question is whether OFDI diverts investible resources from the domestic economy or strengthens long-term

<sup>93</sup> PIB Press Release of the Ministry of Finance, dated 22 August 2022, <https://tinyurl.com/mvdjajkr>.

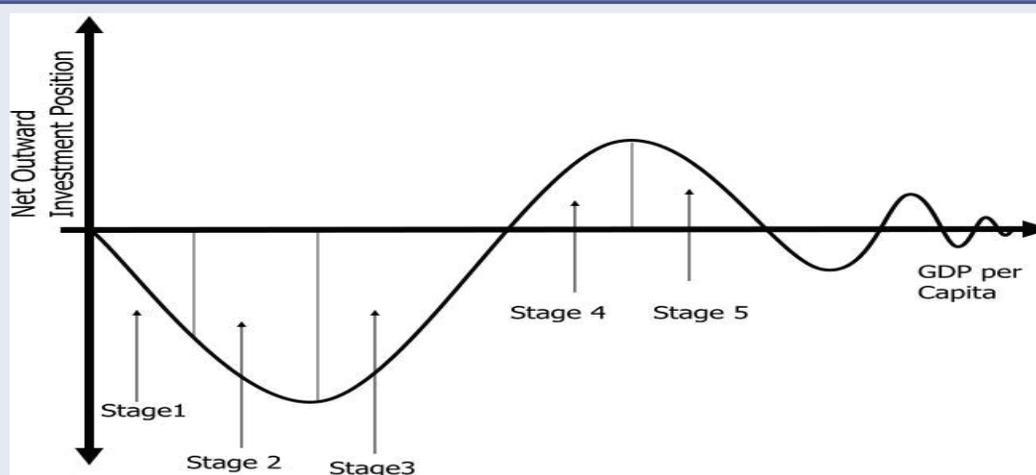
competitiveness through knowledge internalisation, capability enhancement, and greater participation in GVCs. Assessing home-country effects of OFDI, therefore, requires moving beyond concerns of capital flight towards evaluating longer-term productivity and innovation impacts.

### Channels of impact

Knoerich (2017)<sup>94</sup> outlines three principal channels through which OFDI can generate home-country gains: (i) financial returns through repatriated profits, dividends payments and intra-firm transfers that strengthen foreign exchange earnings and potentially relax financing constraints for parent firms; (ii) intangible capability gains as firm's overseas operations expose firms to new technologies, managerial know-how, regulatory & quality standards, and global customer preferences. (iii) tangible capacity gains from acquiring resources, brands, and distribution networks, which deepen domestic production networks, foster product upgrading, and facilitate entry into higher value-added segments of GVCs.

The overall effect of OFDI on the home economy depends on domestic absorptive capacity (skills, R&D, institutions, and financial depth) as well as policies that support the domestic assimilation of overseas knowledge and investment.

**Chart IV. 19: Investment Development Path**



Net Outward Investment becomes persistently positive only at later stages as domestic firms accumulate capabilities.

Note: IDP stages adapted from Dunning & Narula (1996)

The Investment Development Path (IDP) framework (Dunning, 1981<sup>95</sup>; Dunning and Narula, 1996<sup>96</sup>) posits that countries evolve from being predominantly inward FDI recipients in early development stages to net outward investors as their productive capabilities, technological depth, and institutional maturity improve. India is generally assessed to be in Stage III of

94 Knoerich, J. (2017). How does outward foreign direct investment contribute to economic development in less advanced home countries. *Oxford Development Studies*, 45(4), 443-459.

95 Dunning, J.H. (1981). "Explaining the International Direct Investment Position of Countries: Towards a Dynamic or Developmental Approach." *Weltwirtschaftliches Archive*, 117(1), 30-64.

96 Dunning, J. H., & Narula, R. (1996). The investment development path revisited. *Foreign direct investment and governments: Catalysts for economic restructuring*, 1-41.

the IDP, with outward investments increasingly concentrated in technology-intensive sectors, indicating a gradual shift from primarily market-seeking investments to asset and capability-enhancing overseas ventures [Mohanty et al. (2024)].<sup>97</sup>

This pattern aligns with cross-country evidence from BRICS and Next-11 economies, where GDP growth, trade openness, and financial development are major drivers of OFDI, while human capital and inward FDI further reinforce the process in more advanced emerging markets such as BRICS. In turn, higher OFDI is associated with improved economic dynamism, suggesting a two-way relationship between external investment and domestic performance [Mohanty, Sethi and Dash, 2024].<sup>98</sup>

Several studies find that OFDI may substitute for domestic investment in the short run but complements it in the long run, as firms reinvest earnings, upgrade domestic facilities, and strengthen supply chains (Herzer, 2010<sup>99</sup>). Overall, international evidence suggests that outcomes are heterogeneous, shaped by sectoral structure, development stage, and the nature of outward investment (market-seeking vs. efficiency or asset-seeking).

**India's experience:** Empirical evidence from India indicates that OFDI has complemented, rather than displaced, domestic investment. Sahoo and Bishnoi (2021)<sup>100</sup> use macro-panel and time-series approaches to find that outward investment by Indian firms is positively associated with domestic investment. Outward-oriented firms have tended to expand exports and enhance R&D intensity (Das, 2015<sup>101</sup>), benefiting from learning and access to global markets that mitigate concerns regarding capital outflows and support productivity gains at home.

These patterns are consistent with OFDI being used as a mechanism for learning and upgrading, rather than as a pure relocation of existing activities. In India, post-liberalisation policy reforms since the 1990s, such as the relaxation of OFDI norms, simplification of approval processes, and a more open foreign exchange regime, have enabled Indian firms to undertake strategic asset-seeking investments abroad.

### Trends in India's ODI<sup>102</sup>

India's recent outward investment trajectory reflects its progression along the Investment Development Path, with firms increasingly using overseas ventures to acquire capabilities, strategic assets and access to global production systems. Outward investment increased from USD 14.4 billion in FY24 to USD 23.6 billion in FY25, driven by greenfield projects,

97 Mohanty, S., Sethi, N., & Dash, D. P. (2024). What determines outward FDI in developing blocs? A new empirical comparative macroeconomic perspective of post-1990s. *Heliyon*, 10(23).

98 Ibid note 97.

99 Herzer, D. (2010). "Outward FDI and Economic Growth." *Journal of Economic Studies*, 37(5), 476-494.

100 Sahoo, P., & Bishnoi, A. (2021). Impact of outward foreign direct investment: Evidence from Asia. *Journal of Policy Modelling*, 43(5), 1131-1148.

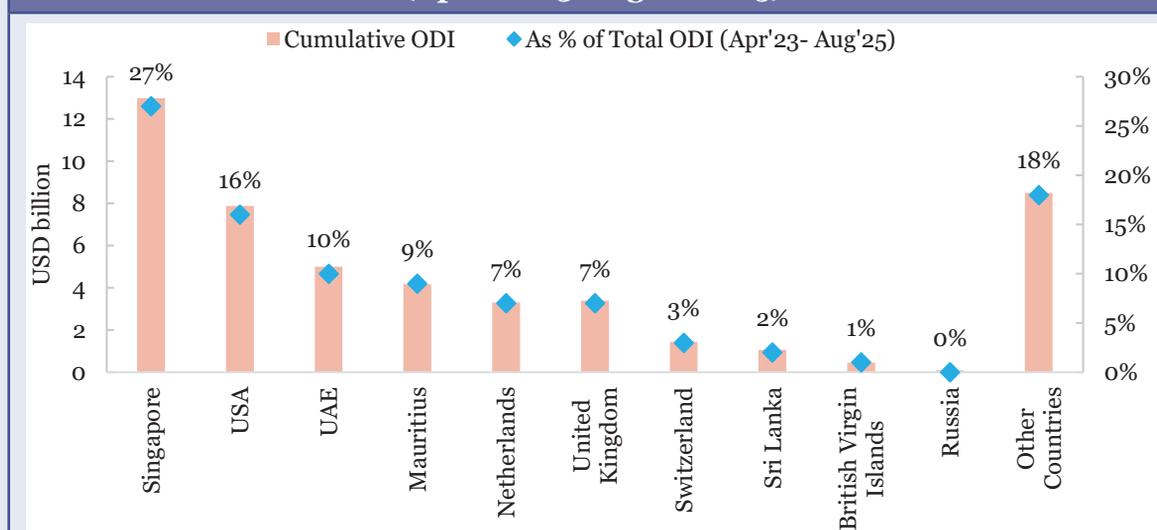
101 Das, K. C. (2015). Outward FDI by Indian manufacturing MNEs: impacts and implications (No. 148). ARTNeT working paper series.

102 OFDI refers to outward FDI as defined by international statistical standards such as UNCTAD. ODI denotes overseas direct investment by Indian residents as reported by the DEA, Ministry of Finance, and captures actual outward flows in the form of equity, loans, and guarantees.

joint ventures, and acquisitions. It increased further to USD 10.2 billion during April-August FY26, compared with USD 7.9 billion in the corresponding period last year.<sup>103</sup> The persistence of outflows despite global financial uncertainties underscores ongoing internationalisation by Indian enterprises.

Between April 2023- August 2025, nearly 82 per cent of cumulative ODI of USD 48.3 billion was directed to the top ten destination countries of Singapore (27 per cent), the United States (16 per cent), UAE (10 per cent), Mauritius (9 per cent) and the Netherlands and the United Kingdom (7 per cent each), reflecting both strategic-asset seeking in advanced markets and the use of international financial hubs.

**Chart IV.20: Geographical composition of India's ODI (April 2023-August 2025)**



Source: Overseas Direct Investment Data Fact Sheet, DEA (<https://tinyurl.com/57wur3kk>)

## Conclusion

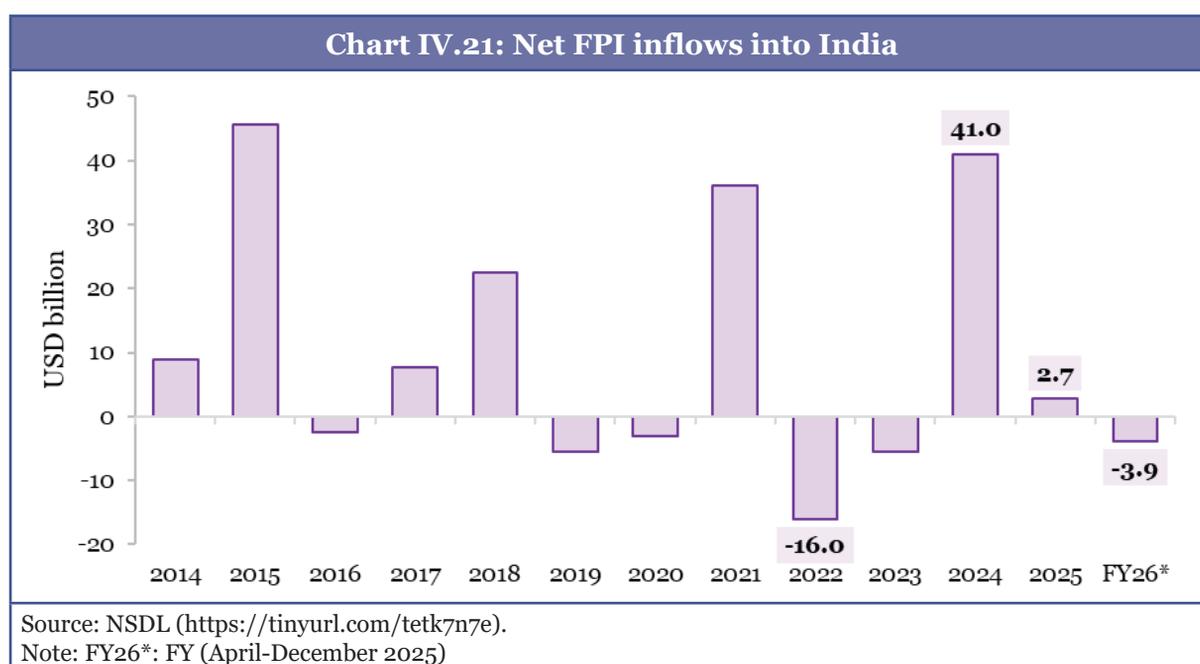
In sum, the home-country effects of OFDI are multi-dimensional and context-dependent. A common pattern across international and Indian evidence is that outward investment tends to reinforce domestic economic strength when underlying capabilities and institutions are robust. In contrast, weak absorptive capacity may result in resource diversion without adequate spillovers.

As Indian firms expand into higher-value segments, OFDI can serve as a strategic instrument for innovation, risk diversification, and global market positioning. The policy focus may therefore lie in enhancing repatriation and diffusion of knowledge, easing access to finance for globalising firms, and strengthening institutional support for international R&D collaboration.

<sup>103</sup> Overseas Direct Investment Data Fact Sheet August 2025, DEA: <https://tinyurl.com/57wur3kk>

## Foreign portfolio investments

4.82 India's FPI pattern shows recurring cycles of inflows and outflows, with significant shifts often linked to global financial changes. While India attracts substantial foreign investment, episodes of sharp outflows, such as after the global financial crisis, during the 2013 'taper tantrum', the 2018 tightening cycle, and pandemic volatility, reflect global financial-cycle sensitivities. These fluctuations underscore how FPI flows, a key external capital source, also serve as channels through which global shocks can impact domestic markets.



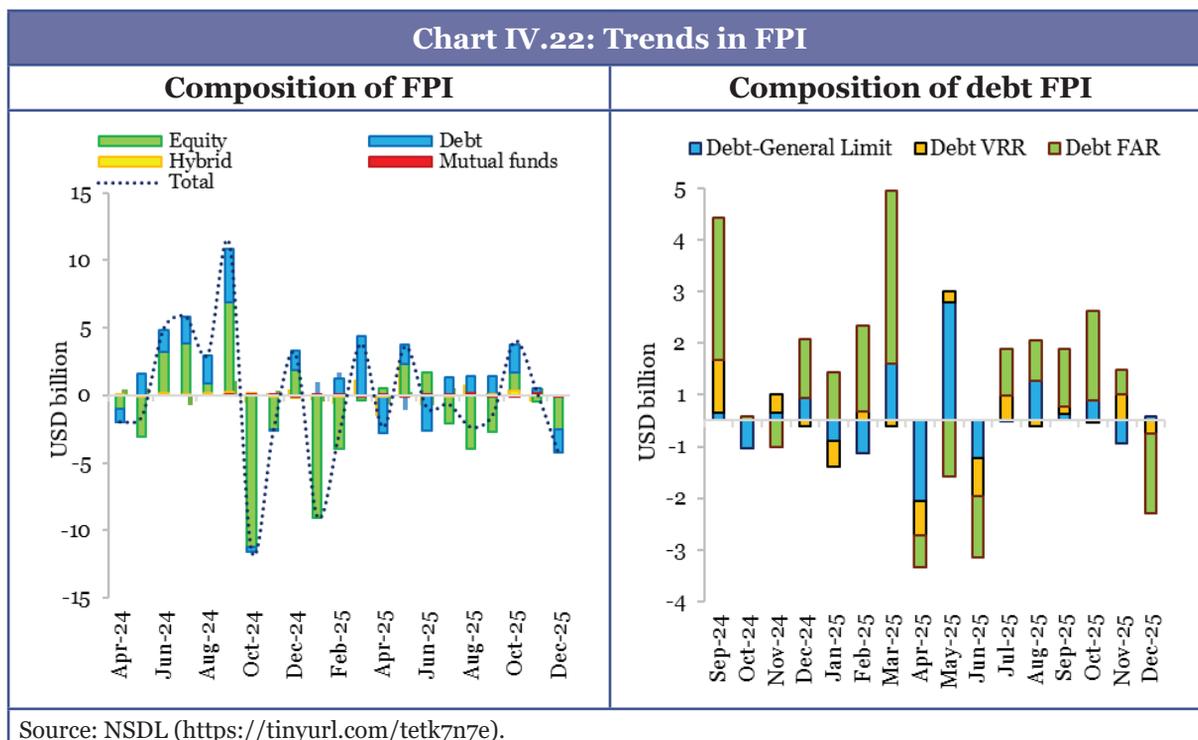
4.83 A breakdown of FPI components shows how foreign participation has evolved. Equity flows tend to dominate in positive years, especially during periods of strong earnings and favourable valuations, whereas debt flows are more sensitive to interest rates and global risk. The Voluntary Retention Route (VRR)<sup>104</sup> and Fully Accessible Route (FAR)<sup>105</sup> routes have stabilised debt flows, particularly when traditional flows were weak.

4.84 FPIs during FY26 (April-December) have fluctuated, mainly influenced by global financial conditions rather than domestic macroeconomic factors. The data indicate volatility, with six months of net outflows and three months of sizable net inflows, resulting in a modest net balance for the year-to-date. The outflow periods in FY26 coincided with periods of tightening global financial conditions, such as rising

<sup>104</sup> Under VRR, FPIs invest in Indian debt instruments with the condition that they will retain at least 75% of their investment for a minimum period (currently three years).

<sup>105</sup> FAR permits FPIs, NRIs, OCIs, and other eligible non-residents to invest without quantitative caps, repatriation limits, or sectoral restrictions in designated G-secs (known as FAR bonds).

US Treasury yields, which often trigger ‘flight-to-safety’ flows into advanced-economy assets. During these periods, foreign investors reduced their holdings in both Indian equities and debt; even categories that typically showed greater stability, such as VRR, experienced occasional selling.

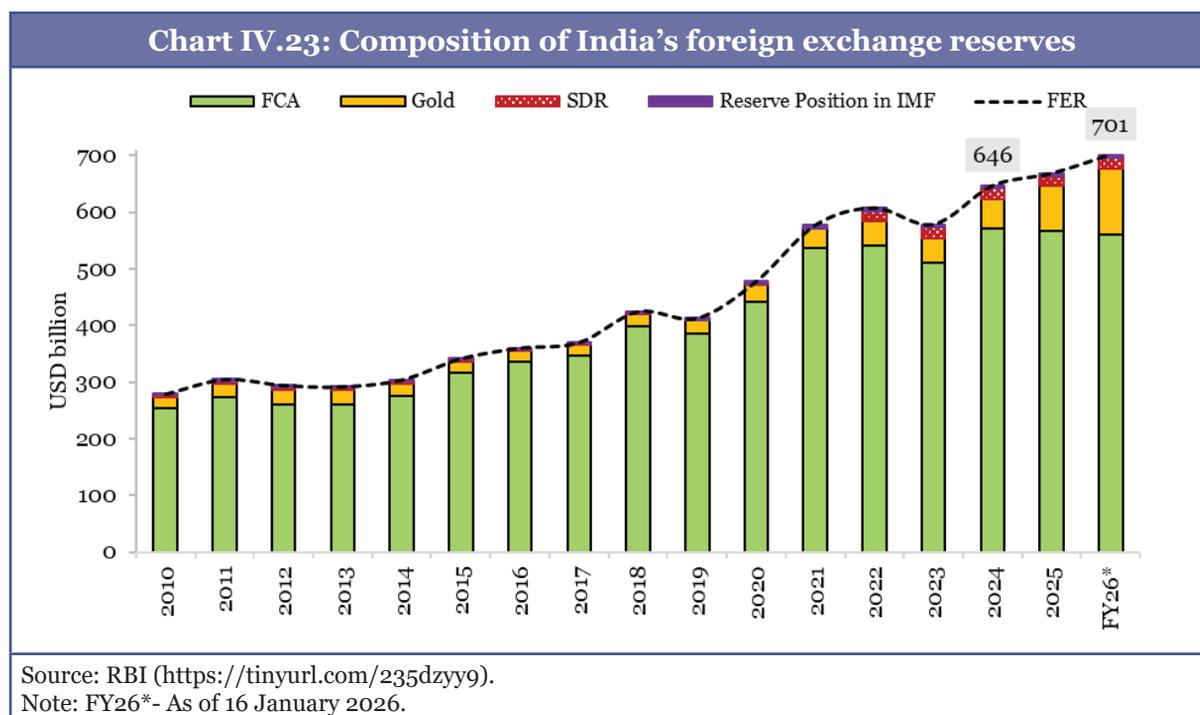


4.85 The three months of inflows in FY26 occurred during periods when global markets reassessed the interest-rate outlook and became more receptive to emerging market risks (May, October and November). These rebounds were mainly driven by the equity segment, supported by renewed interest in India’s corporate earnings trajectory and flows into the debt market as global long-term yields declined. The swift return of inflows during these periods highlights that foreign investors’ medium-term view of India remains positive, even though their short-term allocations are influenced by still-high valuations of Indian stocks and uncertainty about the trajectory of the India-US relationship, amid the high tariffs that Indian goods face in the United States.

### Foreign exchange reserves

4.86 India’s foreign exchange reserves increased to USD 701.4 billion as of 16 January 2026, up from USD 668.3.4 billion as of the end of March 2025. The increase has come at a time when global interest-rate differentials, capital flows and commodity prices remain volatile. This expansion in reserves has helped steady India’s external position despite shifts in global risk sentiment and episodes of portfolio outflows. In terms of adequacy, the reserves as of 16 January 2026 are sufficient to cover around 11 months

of goods imports and about 94 per cent of the external debt outstanding at the end of September 2025, providing a comfortable liquidity buffer.



4.87 Foreign Currency Assets (FCA), which form the liquid core of reserves, softened slightly from USD 567.6 billion in end March 2025 to USD 560.5 billion as of 16 January 2026. In contrast, the gold component rose sharply to USD 117.5 billion as of 16 January 2026, compared with USD 78.2 billion at the end of March 2025. This increase reflects both valuation gains during a period of elevated global gold prices and a continued preference among central banks for diversifying into non-dollar reserve assets.<sup>106</sup>

4.88 The growing share of gold in reserves aligns with a broader international pattern where many emerging markets have increased gold holdings amid geopolitical uncertainty and shifts in the global interest-rate cycle. SDRs remained stable at USD 18.7 billion, while India's reserve position in the IMF increased to USD 4.7 billion.

## Exchange rate

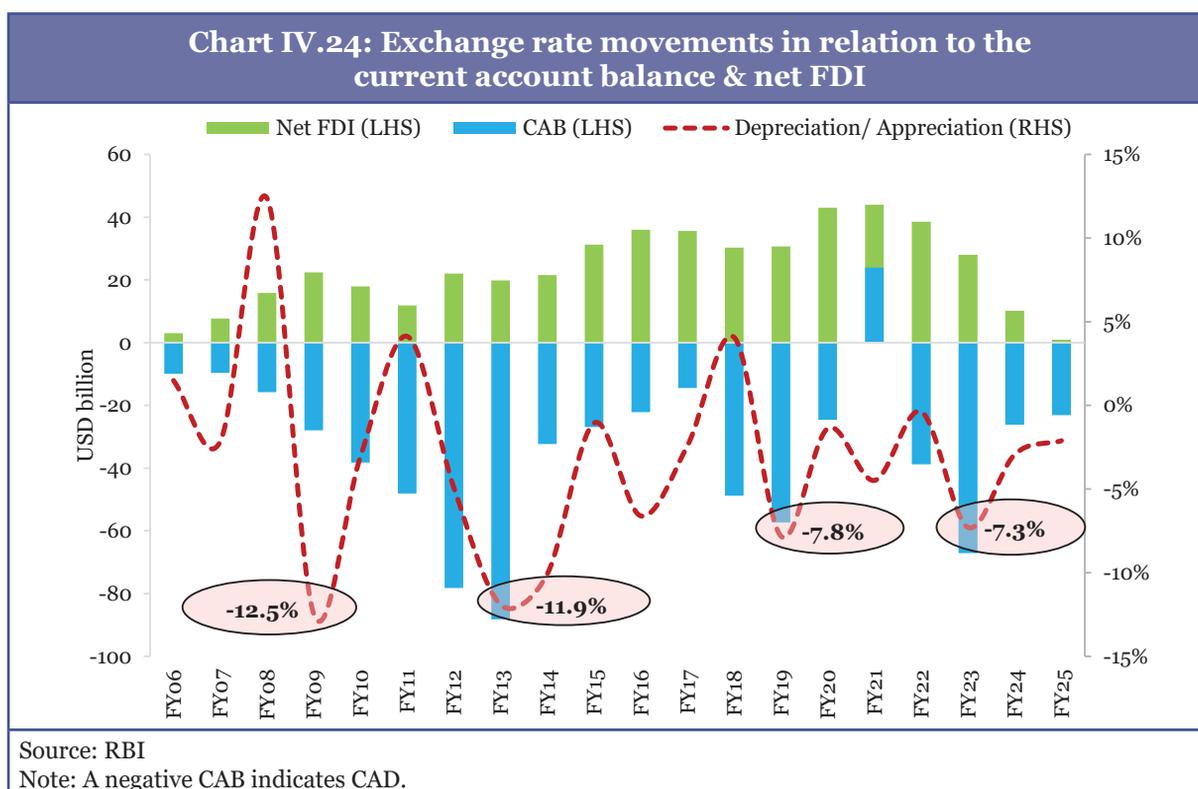
4.89 Between 1 April 2025 and 15 January 2026, the Indian rupee (INR) depreciated by approximately 5.4 per cent against the US dollar. This movement was somewhat larger than in the immediately preceding period, making INR one of the most depreciated currencies alongside the Japanese Yen (-5.5). Other Asian peers experienced relatively lower depreciation, such as the Philippine peso (-3.8 per cent) and the Indonesian rupiah (-1.9 per cent). In contrast, currencies of economies such as Australia, Brazil and

<sup>106</sup> J.P. Morgan Global Research, <https://tinyurl.com/36kb33s6>

South Africa appreciated during this period, supported by favourable terms-of-trade movements.

4.90 In the short run (1 April 2025 – 15 January 2026), exchange rate dynamics in India were shaped by persistent outflows of foreign investment and evolving bilateral trade developments, including tariff-related measures, which together contributed to cautious investor sentiment. These pressures were accompanied by episodes of elevated foreign-currency demand in both spot and forward markets, reflecting hedging behaviour and import-related adjustments.<sup>107</sup> Such factors amplified short-term currency movements even when underlying macroeconomic fundamentals remained stable.

4.91 Traditional BoP inflows, such as exports and foreign capital, that have historically arrested currency depreciation in EMEs, are increasingly influenced by global shifts in geopolitical sentiment.<sup>108</sup> At the same time, import growth, which exerts downward pressure on currencies, tends to rise as these economies advance along their development path. With the certainty of import growth and narrower prospects for the kind of export and capital inflow growth seen during the hyper-globalisation phase, emerging-market currencies can be expected to face persistent depreciation pressures.



4.92 Against this backdrop, India’s historical experience also indicates that exchange-rate outcomes are shaped by the interaction between the current account position and

107 SBI Research: <https://tinyurl.com/nr75py78>.

108 Global Financial Stability Report, IMF: <https://tinyurl.com/52neuvxk>; CEPR: <https://tinyurl.com/bdepraz4>.

capital account dynamics. As shown in Chart IV.24, periods of elevated CAD have generally coincided with sharper rupee depreciation, as observed in FY09, FY13, FY19 and FY23, reflecting pressures from widening merchandise trade deficits. However, there have been notable episodes in which rising imports and a widening trade deficit did not translate into currency depreciation. In FY08, FY18 and FY22, despite a rapid expansion in imports, the rupee appreciated, supported by robust net foreign investment inflows. These episodes underscore that exchange-rate movements are influenced not merely by the size of the trade deficit, but by the composition and stability of capital inflows.

4.93 This historical association between BoP position and exchange rate movements raises an important question about the relative strength of the trade and financial channels through which these effects are transmitted. Box IV.5 extends this analysis by empirically examining how exchange rate variations are transmitted across different components of India's external sector.

#### BOX IV.5: Trade and financial channels of the exchange rate

This is a continuation of the box item (Box IV.7: Trade and Financial channels of the Exchange rate) seen in the Economic Survey of 2023-24.

The previous analysis (published in July 2024) explored the contrasting impact that a weaker currency has on the two key components of the BoP – trade and finance.<sup>109</sup> The trade channel of the BoP gained from a weaker currency, due to a rise in the cost of imports and reducing export prices. On the other hand, a weaker currency does not benefit the financial channel of the BoP. Prolonged currency weakness can raise the cost of foreign lending and lead to a net capital outflow. The box concluded that for India, the benefits stemming from a weaker currency on the trade channel far outweighed the costs arising from the financial channel. On balance, therefore, a weaker currency was beneficial for India's BoP.

The discussion on whether a weaker currency supports the BoP as opposed to a stronger one continues to be a relevant one. Building on the previous box, this analysis offers a more disaggregated picture of the trade channel of the exchange rate by analysing the impact of exchange rate movements on both merchandise and services trade. The analysis utilises external sector data at a quarterly frequency between Q1 of FY12 to Q2 of FY26, employing an autoregressive distributed lag (ARDL) model, which is well-suited for small sample regressions and controls for endogeneity.

The study employs four separate ARDL regressions using dependent variables such as net total trade, net merchandise trade, net services trade and net capital balance. The basic form of the regression is as shown below:

$$\Delta \ln Y_t = \gamma_i \sum Y_{t-1} + \beta_i \sum \Delta Exch Rate_t + \theta X_t + \varepsilon_t$$

<sup>109</sup> For a detailed exploration of the trade and financial channel of the exchange rate, see for instance, Kearns, J., & Patel, N. (2016). Does the financial channel of exchange rates offset the trade channel?. BIS Quarterly Review December, <https://tinyurl.com/m74y6t4u>.

Where  $\ln Y_t$  refers to BoP variables such as net total trade, net merchandise trade, net services trade and net capital balance. The nominal effective exchange rate (NEER) is the exchange rate variable of interest for the regression which analyses net total trade and net merchandise trade. For the regression which analyses services trade, the relevant exchange rate variable is Rupee denominated in US dollar terms.<sup>110</sup> Finally, the regression which analyses the financial channel uses net capital balance as the dependent variable and a debt-weighted exchange rate (DWER) is used as the exchange rate variable. The DWER was constructed using a basket of currencies weighted by their share in India's external debt.

The coefficient  $\beta_i$  indicates the elasticity of changes in BoP variables to changes in the exchange rate.  $X_t$  includes control variables such as World imports, 10-year G-sec yield, commodity prices, domestic demand, the GDP deflator, and a dummy for the COVID-19 years (March 2020 to March 2022).

For each regression, optimal lags were selected using Akaike Information Criteria (AIC), Hannan-Quinn Criterion (HQ) and Bayesian Information Criteria (BIC). Post-estimation checks for autocorrelation and parameter stability were conducted.

### Results and interpretation

The results reaffirm that a weaker exchange rate is beneficial for India's trade balance. A one per cent appreciation of the Rupee results in net total trade declining by 1.26 per cent. If the Rupee strengthens, the merchandise trade balance becomes more negative, with an elasticity of -1.45, indicating that merchandise trade is highly responsive to exchange rate movements. Conversely, if the Rupee weakens, the trade balance improves substantially. On a net basis, therefore, a weaker currency is good for India's merchandise trade balance.

Within the trade basket, services trade exhibits relatively inelastic behaviour, with an elasticity of -0.38. This limited sensitivity likely reflects India's market power in services exports, where demand has become less price-dependent and more reliant on quality and specialised expertise.

**Elasticity estimates for the three separate regression pairs** - Net total trade: NEER, Net merchandise trade: NEER and Net services trade: USD - are as below:

	Dependent variable		
	Net Total Trade	Net Merchandise Trade	Net Services Trade
NEER	-1.26***	-1.45***	
USD			-0.38

'\*\*\*' denotes significance at the 1 per cent level.

For the financial channel, a one per cent appreciation in India's DWER contemporaneously increases net capital inflows by 0.87 per cent. This may be explained, for instance, by the

<sup>110</sup> The USD denominated value of the Indian Rupee showed the highest correlation with services exports as compared to other exchange rate variables. This can be explained by the fact that the US is a major source of India's services trade. Further, nearly 72 per cent of India's software exports (46 per cent of total services exports) are invoiced in the US dollar (Source – RBI's survey on computer service and IT enabled services exports: 2024-25), <https://tinyurl.com/bdh7ja49>.

fact that an appreciation can improve the creditworthiness of local borrowers who have Rupee-denominated assets and borrow in foreign currencies. However, the lagged effect of an appreciation reverses this gain, with capital inflows declining by 1.02 per cent in subsequent periods. This delayed negative impact may reflect central bank intervention following periods of significant appreciation and capital inflows, which moderates exchange rate movements and subsequently affects capital flow dynamics.

**Dependent variable: Net Capital Account**

Regressor	Long-run Elasticity
DWER	0.87***
DWER (t-1)	-1.02***

‘\*\*\*’ denotes significance at the 1 per cent level.

Overall, the conclusion remains that substantial gains from a depreciated Rupee in the merchandise trade channel outweigh any costs incurred through the financial channel. This outcome underscores the continued importance of exchange rate competitiveness in supporting India's export-oriented growth strategy.

### India's exchange rate: Underlying drivers

4.94 In India's case, as the fastest-growing among major economies, its rapid economic growth is naturally driving up import demand. Faster growth increases the need for machinery, electronics, industrial inputs and energy. Moreover, even an increase in export growth can lead to higher imports, as many export industries rely on imported components to some extent. As a result, strong domestic demand, investment-led expansion, and heavy energy dependence combine to make higher growth translate into higher imports, which are necessary to sustain manufacturing expansion and India's integration into GVCs, resulting in persistent trade deficits, which, in turn, translate into a wider CAD. In addition, sustained demand for gold, even during periods of elevated global gold prices, further pressures the trade balance.

4.95 Financing this current account gap places greater reliance on capital inflows. On this front, India has continued to attract investor interest, as reflected in rising gross FDI inflows (Chart IV.16). However, the global environment has shifted markedly. Policy interest rates in major AEs have risen from near-zero levels to around 4-5 per cent over the past few years, making global capital scarcer and more contested. As a result, India is competing not only with other emerging market economies but also with AEs actively seeking to retain investment onshore. Taken together, growth-led current account pressures and tighter global financial conditions reinforce the exchange-rate pressures on the Indian economy in the prevailing geopolitical environment.

4.96 Stepping back from near-term growth and capital flow dynamics, exchange rate outcomes over the medium to long term are fundamentally anchored in a country's

savings-investment balance and its resulting current account position. Historical experience across economies suggests that sustained currency strength is typically associated with persistently high domestic savings and current account surpluses. Countries such as Japan, South Korea, Singapore, Germany and Switzerland have seen their currencies appreciate steadily over long horizons due to their surplus external positions. Conversely, economies that have transitioned into persistent CADs, notably the UK and the US, have generally experienced weaker currency trajectories over time, notwithstanding episodic phases of strength. This suggests that, going forward, durable currency strength is unlikely without the ability to generate high domestic savings and sustained external surpluses.

4.97 Moreover, international experience further suggests that the transition from persistent CAD to sustained surpluses and correspondingly currency credibility has typically been mediated by the structure and composition of export growth. In this context, Box IV.6 discusses the experience of several East Asian economies, which offers useful insights into the role of manufacturing exports and complementary services in shaping durable exchange-rate outcomes.

#### **Box IV.6: Manufactured Exports, Services and Currency Credibility: Lessons from East Asia**

Currencies that are considered stable and credible in global markets usually reflect deeper economic strengths. Beyond sound macroeconomic policy, credibility builds over time when an economy reliably earns foreign exchange, including during periods of stress. Across several successful industrialising economies, especially in East Asia, a common pattern is visible: strong growth in manufacturing exports preceded improvements in current account positions, reserve accumulation and the gradual strengthening of currency credibility.

Rapid growth and investment typically lead to increased imports of machinery, capital goods, intermediate inputs and energy. Unless export capacity expands at a similar pace, growth can place pressure on the BoP.<sup>111</sup> The East Asian response to this constraint was to make manufacturing exports a central part of their development strategy. In Japan after the Second World War and in South Korea and Taiwan from the 1970s onwards, production shifted progressively toward machinery, transport equipment, electronics, precision instruments, and other complex manufactured goods.<sup>112</sup> These sectors connected domestic firms to global supply chains, creating export streams that were larger, more diversified, and more durable than those based on primary commodities or low-value assembly.

Over time, persistent export strength translated into current account surpluses, accumulation of reserves and foreign assets, and greater confidence that these economies could manage

111 Felipe, J. (2018, July). Asia's industrial transformation: The role of manufacturing and global value chains (Part 1) (ADB Economics Working Paper Series No. 549). Asian Development Bank. <https://tinyurl.com/mrdbveay>.

112 Perkins, D. H., & Tang, J. P. (2017). East Asian industrial pioneers: Japan, Korea, and Taiwan. In *Asia's journey to prosperity: Policy, market, and technology* (pp. 169–196). Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780198753643.003.0008>.

external shocks without major disruption. Currency credibility followed this process gradually, as sustained external surpluses, rising foreign asset positions and the resilience of export earnings through global downturns became visible to markets. A notable exception is the US, where the global strength of the dollar reflects financial depth and reserve-currency status rather than export surpluses; this represents a distinct pathway not typically available to late-industrialising economies.

Industrial policy played an important supporting role, but it was designed differently from approaches that rely mainly on permanent protection. In many East Asian cases, support was selective, time-bound and linked to performance. Governments employed tools such as preferential credit, investment coordination, or temporary tariff relief, but these measures were generally accompanied by expectations of improved productivity, increased scale, and entry into export markets. Firms that failed to compete internationally were not guaranteed continued shelter. Export performance thus acted as a practical test of whether capabilities were genuinely being built.

An equally important feature was the careful treatment of protection in different parts of the production system. Policymakers were generally cautious about extending strong protection to upstream producers of basic materials and intermediate goods, such as steel, petrochemicals or industrial fibres, when these inputs were widely used across downstream manufacturing.<sup>113</sup> High protection in these upstream sectors risked raising costs for a much larger set of firms engaged in export-oriented production. Where investment in upstream capacity was encouraged, it was usually combined with an emphasis on cost competitiveness and export orientation, rather than insulation that shifted costs onto user industries. The experience suggests that, in complex industrial ecosystems, decisions about what not to protect can be as important as decisions about what to support.

Within firms, this policy structure encouraged learning and technological upgrading. Access to imported capital goods, investments in technical education, standards and testing infrastructure, and targeted research support helped raise productivity in manufacturing. As firms moved into higher-value segments, exports became more sophisticated and less easily replaceable. This complexity provided a degree of resilience: participation in GVCs and the reliability associated with these products helped sustain foreign exchange earnings even when global conditions weakened.

The result was not an immediate transformation of currency status, but a steady strengthening of BoP fundamentals. Japan's emergence as a major exporter in the 1960s and 1970s, and Korea and Taiwan's transition to sustained current account surpluses after the 1980s, coincided with greater confidence in their ability to manage external risks. In each case, the credibility of the currency reflected the accumulated strength of the external sector, rather than being achieved solely through financial signalling.

A natural question in the contemporary context is whether strong service exports can play a similar role. Modern tradable services, including information technology, logistics, finance and business services, are now significant contributors to export earnings in many economies.

---

<sup>113</sup> Ibid note 111.

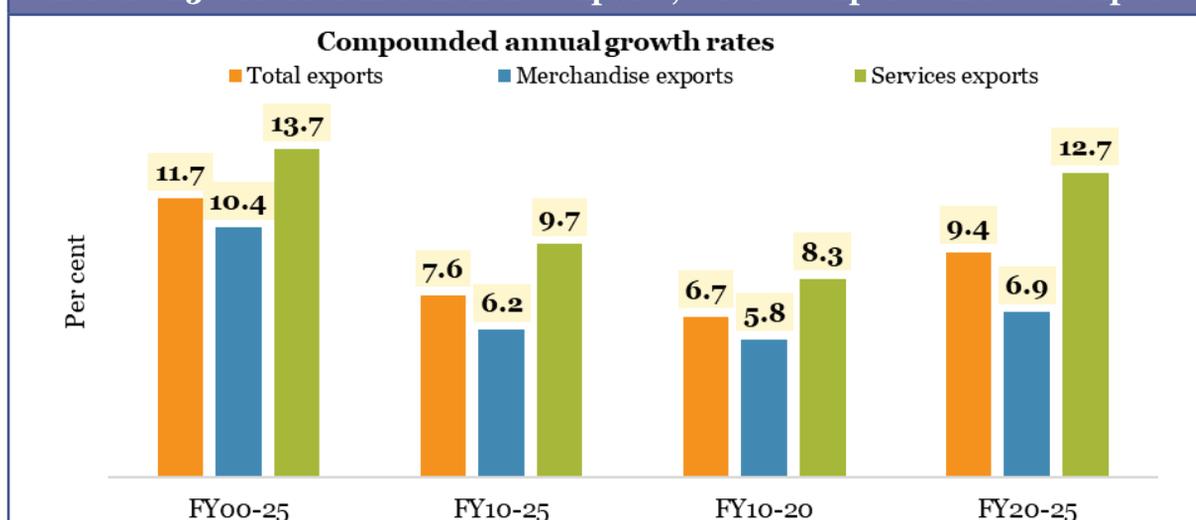
They support income growth and help moderate external pressures. However, international experience indicates that services exports, by themselves, rarely generate the same degree of scale, employment linkages, or counter-cyclical support as broad-based manufacturing export growth, particularly in large and fast-growing economies.<sup>114</sup>

Overall, the East Asian experience points to a broad conclusion. Durable external resilience and stronger currency credibility have, in most successful late-industrialising economies, emerged from the gradual build-up of manufacturing export capacity, supported by disciplined, productivity-oriented industrial policy, careful management of input costs across value chains, and the complementary growth of high-value services. Where this combination has persisted over time, the outcome has been more robust external balances and greater confidence in the economy's ability to navigate global shocks.

4.98 These cross-country experiences highlight that durable currency strength has rarely emerged as a by-product of financial openness or macroeconomic signalling alone. Instead, it has been grounded in the gradual build-up of export capabilities, particularly in manufacturing. For India, this implies that improving medium-term exchange-rate outcomes is inseparable from building a strong and competitive manufacturing base anchored in export growth.

4.99 Manufacturing exports remain the most reliable channel through which productivity gains, scale economies and global demand can be translated into durable current account improvement. While India's manufacturing base has expanded in absolute terms, progress in moving towards more sophisticated and diversified export capabilities has been uneven. This is reflected in India's trajectory on the ECI, as discussed in paragraph 4.44 above. As shown in Chart IV.25, the CAGR of services exports has consistently exceeded that of merchandise exports.

**Chart IV.25: CAGR of merchandise exports, services exports and total exports**



Source: FTPA, Department of Commerce (<https://tinyurl.com/mw864w62>) and DBIE, RBI (<https://tinyurl.com/58jae338>).

<sup>114</sup> Trade in Services & Employment (UNCTAD), <https://tinyurl.com/2pwwephp>.

4.100 Innovation-related indicators present a similar picture of gradual progress accompanied by relative slippage. India has improved its standing in the World Intellectual Property Organisation's Global Innovation Index over the past decade and is consistently assessed as performing above expectations for its income level. These gains can be attributed to policy reforms, digital transformation, and a vibrant startup ecosystem. However, India's improvement has been slower than that of several peer economies, including China, particularly on indicators related to high-technology manufacturing and private R&D expenditure. This suggests that while innovation inputs have strengthened, their translation into globally competitive manufacturing and export outcomes remains incomplete.

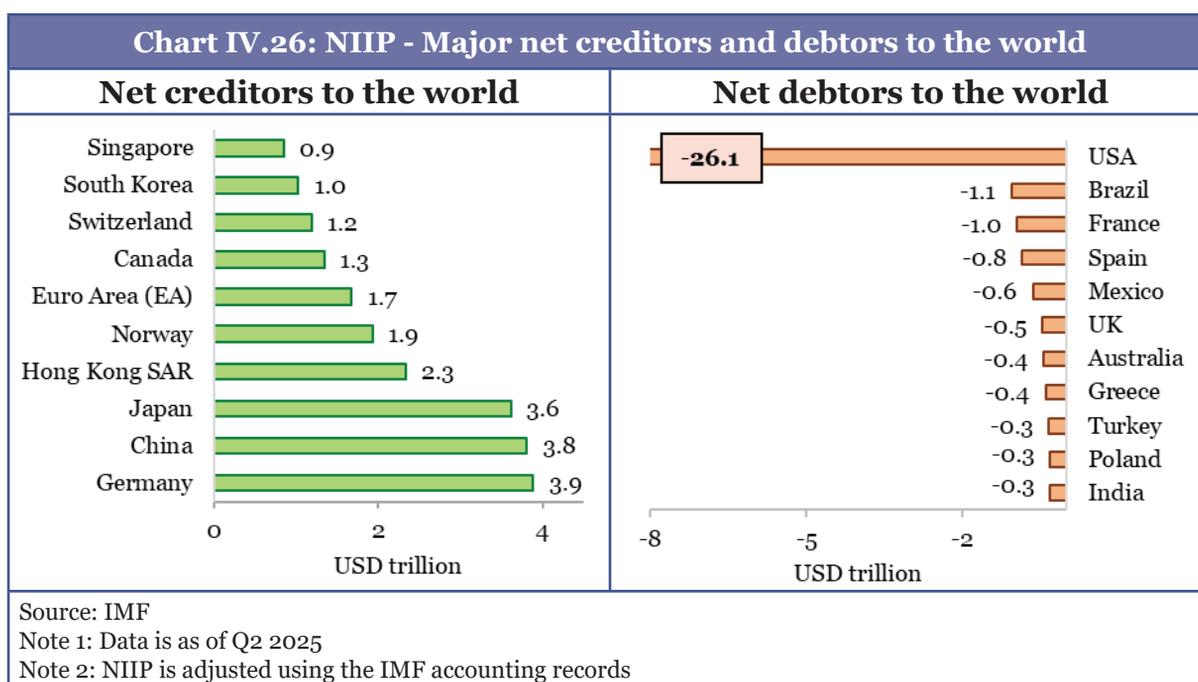
4.101 Sustained export competitiveness will ultimately rest on the ability to deliver consistent quality at scale, which in turn depends on a deeper culture of innovation, continuous productivity improvement and investment in R&D by the private sector. Government initiatives, such as the ANRF and RDIF, can act as catalytic enablers in this process; however, the primary onus will lie with the private sector to scale up R&D spending, adopt advanced technologies and internalise quality-driven production norms. This transformation will also require states to create an enabling ecosystem for innovation, investment, and industrial scaling, so that these forces can operate effectively, as discussed in greater detail in Chapter 16 of this Survey.

4.102 Complementing this process, FDI assumes a critical role beyond its contribution to financing. Stable FDI facilitates technology transfer, productivity enhancement and integration into GVCs, thereby strengthening export capacity and productivity over time. Deeper GVC integration, however, will require a coordinated, mission-mode approach involving close inter-ministerial collaboration at the Union level and effective coordination with State governments. Portfolio flows, by contrast, are inherently more volatile and sensitive to shifts in global financial conditions. Policy efforts in this domain should therefore prioritise ease of doing business through procedural simplification, streamlining tax processes and facilitating greater participation by non-resident investors.

4.103 Over the long run, the exchange rate outcomes are thus a reflection of economic fundamentals. At the same time, in the short term, they are shaped by investor sentiment and capital flow dynamics, leading to phases of both undershooting and overshooting relative to fundamentals. Over time, however, currency performance will be determined by the economy's ability to generate domestic savings, sustain external balance, attract stable FDI, and build export competitiveness rooted in innovation, productivity and quality.

## International Investment Position

4.104 Over the past decade, changes in the Net International Investment Position (NIIP)<sup>115</sup> have shaped the world's external wealth landscape. In CY 2024, Germany overtook Japan to become the world's largest creditor nation for the first time in 34 years,<sup>116</sup> reflecting its sustained current account surpluses and strong trade performance. This position was maintained in Q2 CY 2025, with Germany and China emerging as the two largest creditor economies, followed closely by Japan, with a NIIP of USD 3.6 trillion. At the other end of the spectrum, the US remained the world's largest debtor, with a NIIP of USD 26.1 trillion at Q2 CY 2025, followed by Brazil, France and Spain. India ranked as the 11th largest debtor globally, with a negative NIIP of USD 0.3 trillion as of Q2 CY 2025.



4.105 India historically has a net debtor status. During FY25, net claims of non-residents declined by USD 31.2 billion. This was driven by a sharper rise in residents' overseas financial assets (+USD 105.4 billion) compared to external financial liabilities (+USD 74.2 billion). Over 72 per cent of the rise in India's overseas financial assets was due to an increase in overseas direct investment, currency and deposits, and reserve assets. On the liabilities side, inward direct investments, loans, as well as currency and deposits, accounted for over three-fourths of the rise in foreign liabilities during the year.

4.106 India's international financial assets-to-liabilities ratio improved from 74.1 per cent in March 2024 to 77.5 per cent in March 2025, indicating rising resilience.

<sup>115</sup> NIIP shows the difference between a country's external assets and liabilities at a specific time. A positive NIIP means a net creditor; a negative NIIP indicates a net debtor.

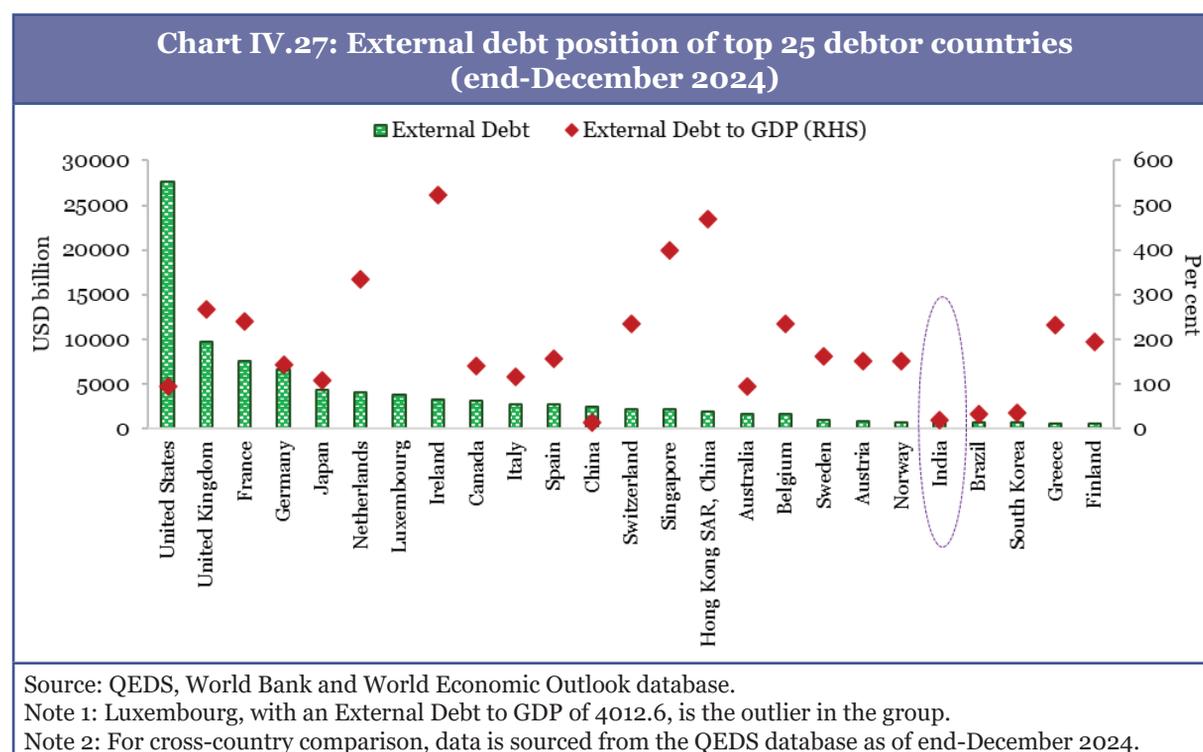
<sup>116</sup> Yokoyama, E. (2025, May 27). Germany ends Japan's 34-year run as world's top creditor nation. (Bloomberg), <https://tinyurl.com/43e4upsy>.

Correspondingly, net IIP as a ratio to GDP improved to -8.7 per cent, compared to -10.1 per cent a year ago and -14.1 per cent five years earlier, highlighting a sustained strengthening of India's external balance sheet.<sup>117</sup>

## External debt

4.107 Global external debt continued to rise in CY 2024 amid tight global financial conditions and elevated policy rates. At end-December 2024, global external debt stood at USD 104.4 trillion, up 1.4 per cent from a year earlier. AEs accounted for 88.1 per cent of the total (USD 92.0 trillion), while EMDEs recorded a faster expansion, with external debt rising to USD 12.4 trillion.

4.108 In the global context, India ranked 21st worldwide and 11th within the G20 at end-December 2024, with an external debt stock of USD 718.2 billion, a 10.7 per cent increase YoY. Despite this expansion, India remains modestly leveraged, with an external debt-to-GDP ratio of 18.4 per cent, well below that of many large economies<sup>118</sup>. Accordingly, India accounts for only 0.69 per cent of global external debt, underscoring its relatively small contribution to global indebtedness.

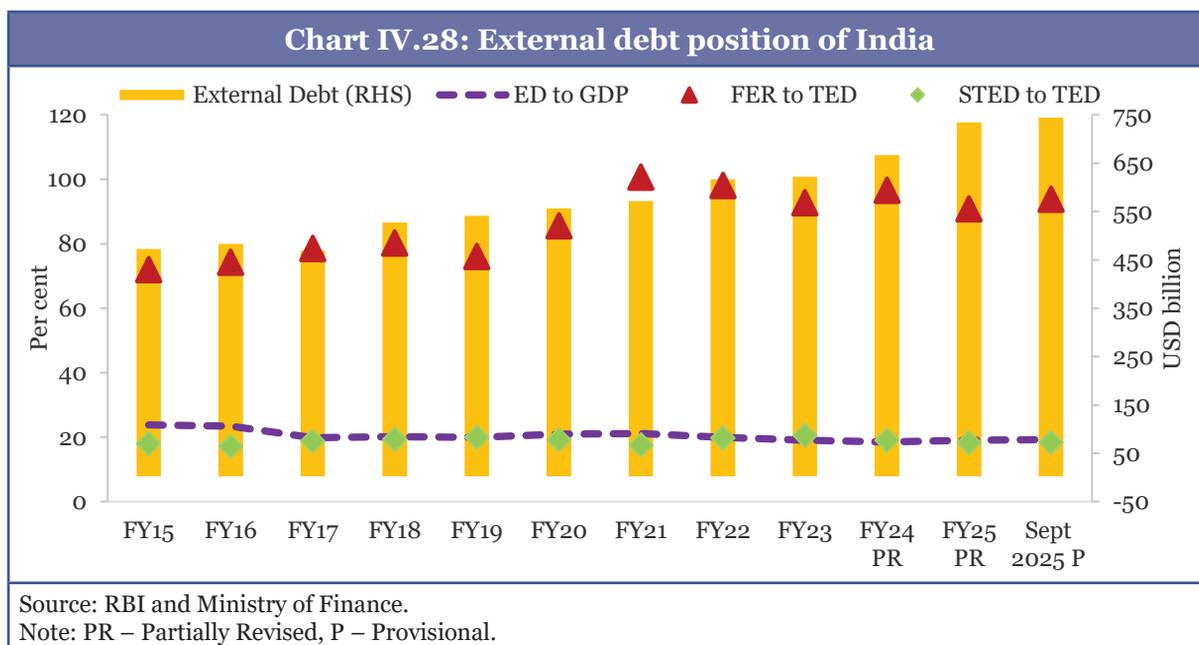


4.109 India's external debt stood at USD 746 billion at end-September 2025, up from USD 736.3 billion at end-March 2025. The external debt-to-GDP ratio has remained broadly stable, averaging around 20.2 per cent over the last decade (end-March 2016

<sup>117</sup> India's International Investment Position (IIP), March 2025 (RBI): <https://tinyurl.com/nhd26a65>.

<sup>118</sup> Cross-country comparisons are undertaken for CY 2024, in line with the availability of comparable GDP data.

to end-March 2025). Another key factor is that external debt constitutes less than 5 per cent of the government of India's total debt, which mitigates the external sector risks.<sup>119</sup>



## CONCLUSION AND OUTLOOK

4.110 A fundamental reordering of the global economic landscape is shaping India's external sector outlook. Trade, investment and capital flows are increasingly influenced by geopolitical alignments, industrial policy and strategic considerations, implying that the external environment is likely to remain volatile and less supportive than during the earlier phase of hyper-globalisation. For emerging market economies, this shift entails greater competition for capital, slower expansion of global trade volumes and heightened sensitivity of external flows to policy and geopolitical developments.

4.111 India's external sector remains strong, with deepening global integration driven by robust exports, resilient services trade, and expanding trade networks. This reflects increased competitiveness, diversification, and adaptability to global demand. Services exports lead, while non-petroleum merchandise exports hit record levels, showcasing growth in high-value manufacturing and knowledge trade. This strength is supported by healthy foreign exchange reserves and a moderate external debt profile.

4.112 As growth-driven import demand increases with greater global integration, India's external sustainability depends on the quality and stability of its financing. The

<sup>119</sup> RBI Bulletin November 2025: <https://tinyurl.com/9b3ctywc>.

composition of capital inflows is key. FDI is the most stable source, supporting BoP stability, productivity, technology transfer, and export growth. Maintaining FDI amid a competitive global capital market requires improving the investment climate, deeper GVC integration, and coordinated policies across government levels.

4.113 The current environment also highlights the importance of achieving strong export growth, making an export-oriented policy a pressing necessity. A robust and stable currency can only be achieved through export competitiveness. History demonstrates that countries with sustained manufacturing export success are those that have maintained hard currency status, characterised by currency stability and strength.

4.114 This requires a unified effort to reduce manufacturing costs, thereby enhancing the country's export competitiveness. This includes correcting inverted duties, improving logistics infrastructure, lowering logistics costs, and reducing regulatory expenses. Simultaneously, selective import substitution that is not unlimited but grounded in productivity, export competitiveness, and measurable results may be considered.

4.115 In sum, India's external sector enters this phase of global fragmentation with strengthened buffers, diversified trade linkages and improving resilience. The policy challenge lies in leveraging these strengths to sustain external stability while supporting a high-growth trajectory in a world where global integration is increasingly shaped by strategic, rather than purely economic considerations. Over the medium to long term, this underscores the importance of policies that support manufacturing competitiveness, innovation, productivity and quality, alongside efforts to mobilise domestic savings.

\*\*\*

*This page has been left blank*

## INFLATION: TAMED AND ANCHORED

*This chapter provides a comprehensive analysis of recent trends in global and domestic inflation, with a particular focus on the period up to December 2025. Globally, inflation has moderated significantly from its post-pandemic highs, with advanced economies stabilising at 2–3 per cent and emerging markets, including India, experiencing a notable decrease in the rate of inflation. The moderation is attributed to easing commodity prices, particularly in food and energy, as well as responsive monetary policies by central banks. India stands out for achieving a sharp decline in headline inflation, alongside robust GDP growth, reflecting strong macroeconomic fundamentals and effective monetary policy.*

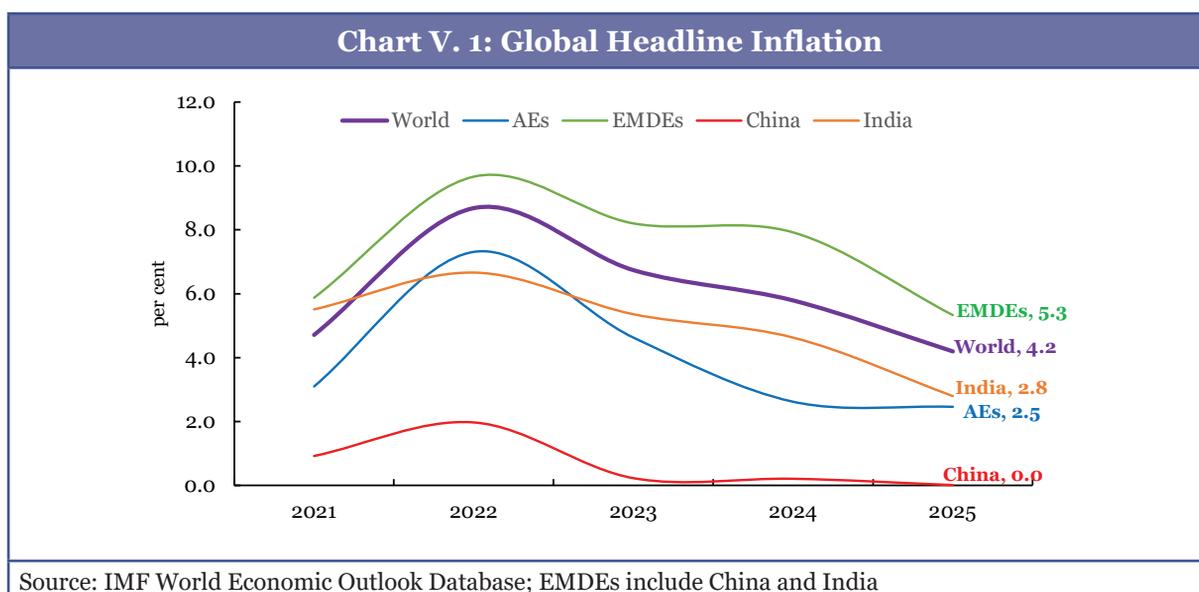
*Domestically, retail inflation (CPI) has followed a clear downward trajectory, reaching 1.7 per cent in 2025–26, driven primarily by a steep decline in food prices—especially vegetables, pulses, and spices—supported by favourable agricultural conditions and timely policy interventions. Core inflation, while appearing sticky, is shown to be largely influenced by surges in precious metals; when these are excluded, underlying inflationary pressures are more subdued. The analysis highlights the critical role of government interventions in stabilising food and edible oil prices.*

*The chapter also explores sectoral price dynamics, noting a long-term decline in the terms of trade for manufacturing relative to agriculture, which has implications for resource allocation and investment. On the other hand, regional inflation patterns reveal greater volatility in rural areas due to higher food weights in consumption baskets. However, overall, state-level inflation outcomes have converged within the Reserve Bank of India's tolerance band, with few exceptions. The Chapter also examines the drivers of divergence in state-level inflation experiences.*

*Looking ahead, the outlook remains favourable, with projections of inflation staying within target ranges, supported by strong agricultural output, stable global commodity prices, and continued policy vigilance. However, risks from currency fluctuations, base metal price surges and global uncertainties persist, warranting ongoing monitoring and adaptive policy responses.*

## GLOBAL INFLATION DEVELOPMENTS

5.1. The world has seen a broad-based and sustained moderation in inflation across advanced, emerging, and developing economies this year. The global headline inflation (Chart V. 1) has declined from a peak of 8.7 per cent in calendar year (CY) 2022 to 4.2 per cent in CY 2025. Following the post-pandemic surge to 7.3 per cent, inflation rates have stabilised in the range of 2-3 per cent in advanced economies (AEs), while they have moderated in emerging market and developing economies (EMDEs) to 5.3 per cent from an elevated level of 9.7 per cent. According to IMF records, for the comparable period, India recorded an inflation rate of 2.8 per cent, while China continued to experience price stagnation.



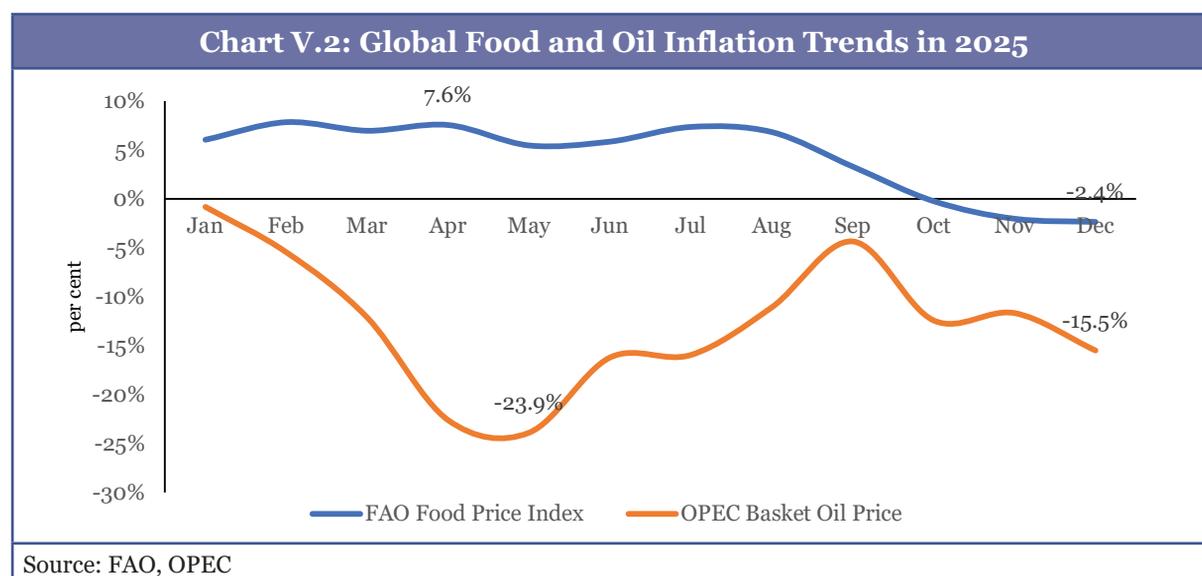
5.2. In the United States, headline inflation declined from 3.0 per cent in 2024 to 2.7 per cent in 2025, driven largely by moderating core services inflation, along with continued negative inflation in major commodity prices. However, inflationary pressures may resurface in the US, with the eventual pass-through of increased tariffs to the final consumers and monetary easing by the Fed. Similarly, the Euro region experienced a slight moderation in its headline inflation, which declined from 2.3 per cent to 2.1 per cent this year, driven largely by easing energy and food prices, despite the Russia-Ukraine war raging in Europe. On the other hand, headline inflation in the United Kingdom rose to 3.4 per cent compared to 2.5 per cent in 2024, due to high service inflation, as well as pressure from persistent policy rate cuts. Another outlier, Japan, saw a structural shift away from chronic low inflation/deflation toward sustained, wage-driven inflation, with its headline inflation rising from 2.7 per cent in 2024 to 3.3 per cent in 2025, associated with a weakening of its currency, resulting in higher import prices for Japanese staple rice and moderate services inflation.

## Monetary Policy responses of global central banks

5.3. In response to easing or moderate inflationary pressures and considering the domestic growth pangs, central banks in AEs have continued to reduce policy rates during the current year, with cumulative cuts ranging from 75 to 100 basis points in the UK, the Euro Area, and the United States.<sup>1</sup> The Reserve Bank of India, during the same period, reduced the policy rate by 125 basis points. The Bank of Japan (BoJ), which ended its negative interest rate regime in 2024, remained an outlier among major economies by increasing its policy rate by 50 basis points in response to its rising inflation.

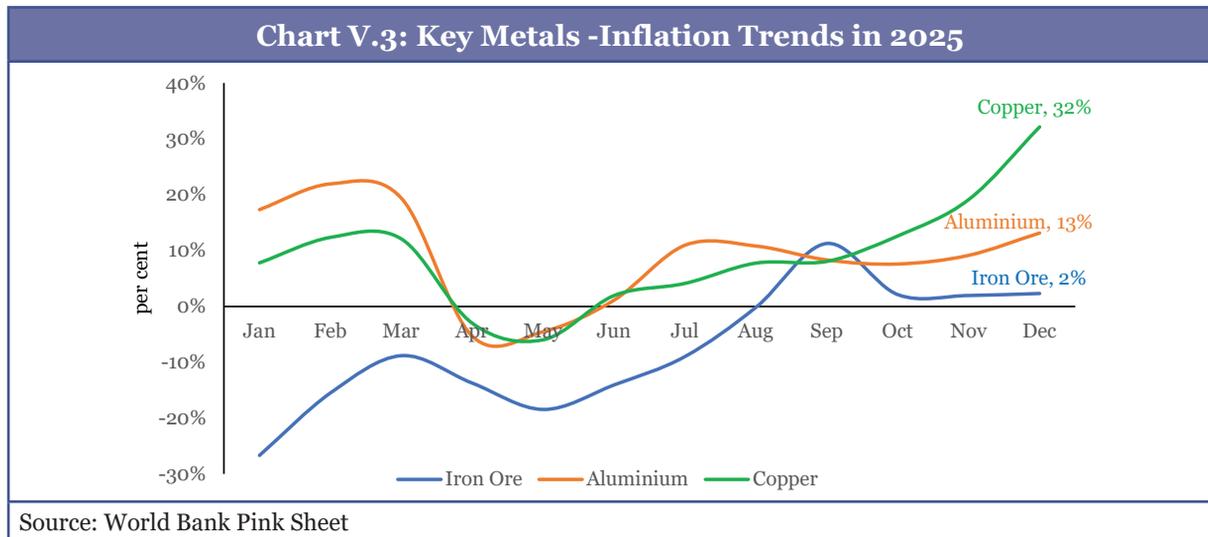
## Drivers of Global Inflation

5.4. Global inflationary pressures could be contained as there was a general decline in oil and food prices alongside easing inflation in key commodities (Chart V.2). Following the decline in previous years, food prices remained relatively stable in the first half of 2025, before dipping into the negative terrain by October 2025. Oil prices have decreased by more than 20 per cent compared to the start of the Calendar Year, with inflation remaining in the negative zone throughout the year.



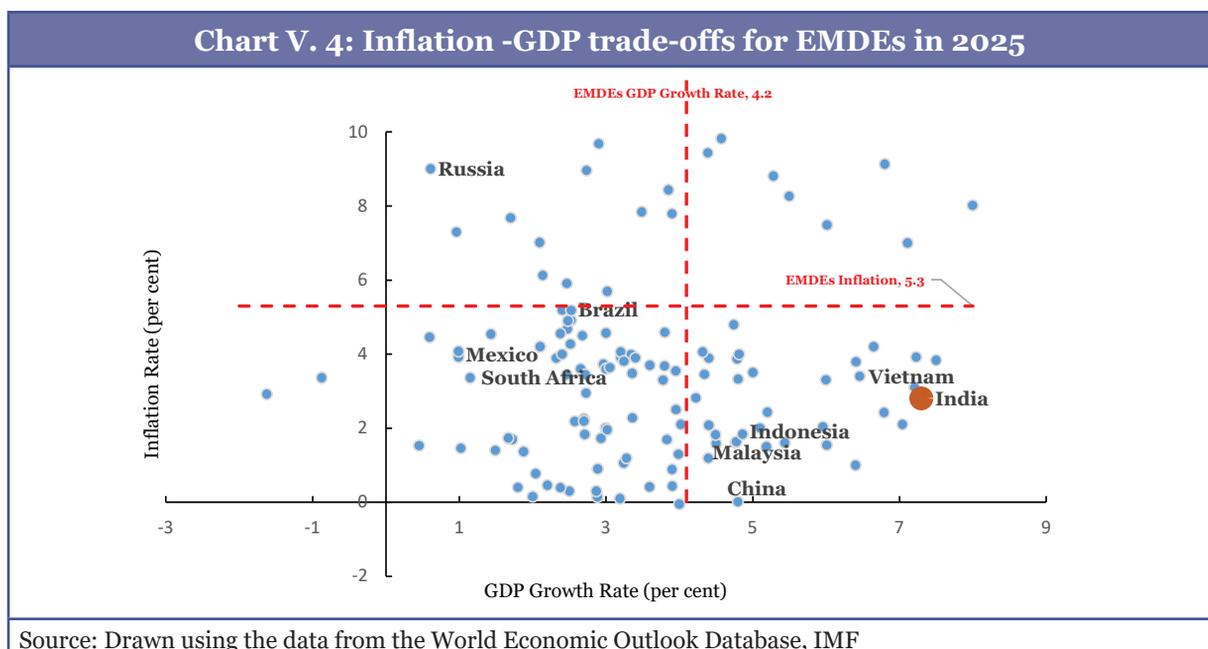
5.5. Global prices of key metals (Chart V. 3), such as aluminium and copper, declined in the first half of 2025 but recovered slowly in the second half of the year. Recently, copper prices have been surging due to Data Centre/AI demands, as well as tight supplies. For many months, iron remained in the deflationary zone. The subdued inflation in these critical commodities has contributed to reduced input costs in several industrial goods.

<sup>1</sup> Source: Bank of International Settlements (BIS).



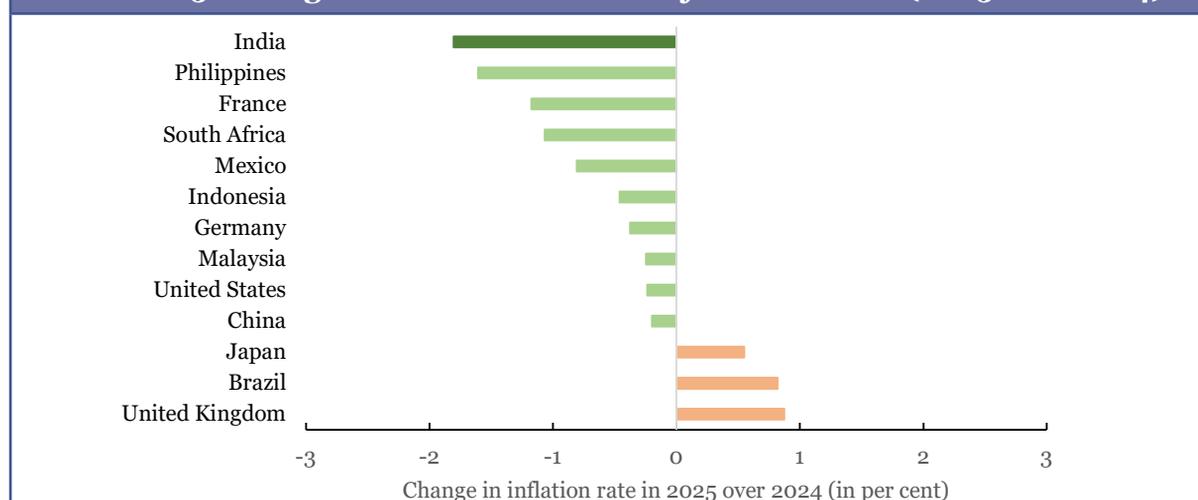
### Growth-Inflation Trade-off in EMDEs

5.6. While economic growth in a majority of EMDEs remained below the EMDE average of 4.2 per cent, inflation outcomes varied widely across countries (Chart V. 4). In Brazil, headline inflation rose steadily from 4.4 per cent in 2024 to 5.2 per cent in 2025, before easing in subsequent months as service inflation moderated. Russia experienced subdued GDP growth alongside persistently high inflation, reflecting the ongoing conflict in Ukraine and related trade sanctions. In contrast, inflation moderated in several major Southeast Asian economies, including Malaysia, Indonesia, and the Philippines, supported by lower imported commodity costs. Notably, China experienced significant deflation during the year, driven by weak domestic demand, export pressures arising from tariff regimes, and excess capacity in several manufacturing industries, which kept producer prices in negative territory.



5.7. Among major EMDEs, India has recorded one of the sharpest declines in headline inflation, amounting to about 1.8 percentage points (Chart V. 5). Importantly, this disinflation has occurred alongside robust GDP growth of 8 per cent in the H1 of FY26, underscoring India's strong macroeconomic fundamentals and its ability to sustain growth while effectively managing price pressures, or in other words, without overheating. While upgrading India's sovereign rating, global rating agencies have also acknowledged the credibility and effectiveness of India's inflation management. For instance, S&P observed that *“Monetary policy reform to switch to inflation targeting has reaped dividends. Inflationary expectations are better anchored than they were a decade ago. Between 2008 and 2014, India's inflation reached double-digits on numerous occasions. In the past three years, despite volatility in global energy prices and supply-side shocks, CPI growth averaged 5.5 per cent. In recent months, it stayed at the lower bound of the Reserve Bank of India's (RBI) target range of 2-6 per cent. These developments, coupled with a deep domestic capital market, reflect a more stable and supportive environment for monetary settings.”*

**Chart V. 5: Change in Inflation Rate in Major Economies (2025 over 2024)**



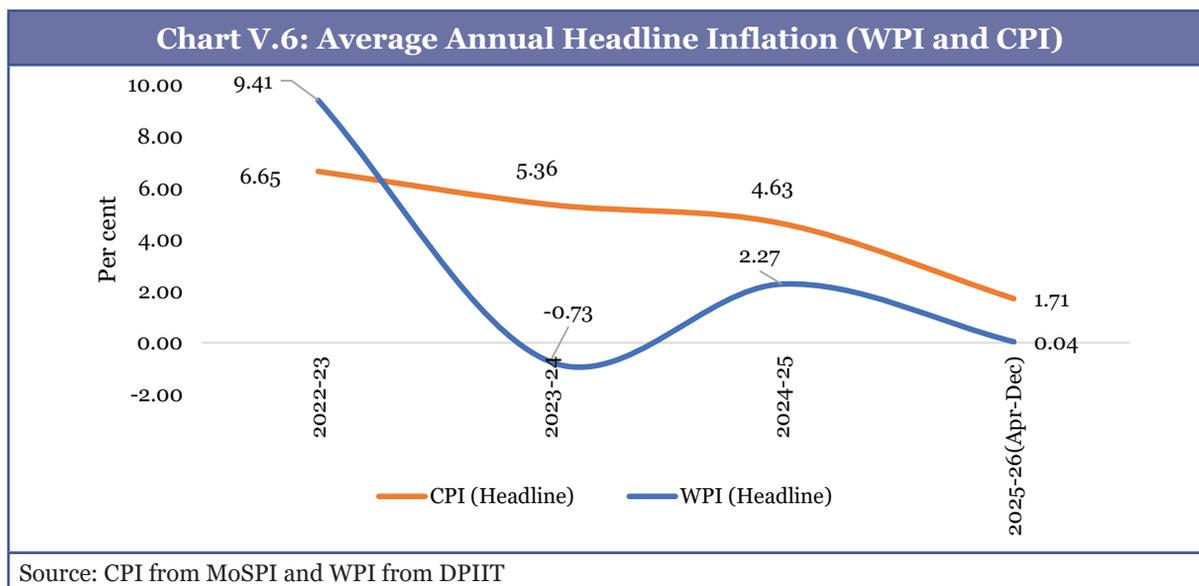
Source: World Economic Outlook Database, IMF

## DOMESTIC INFLATION

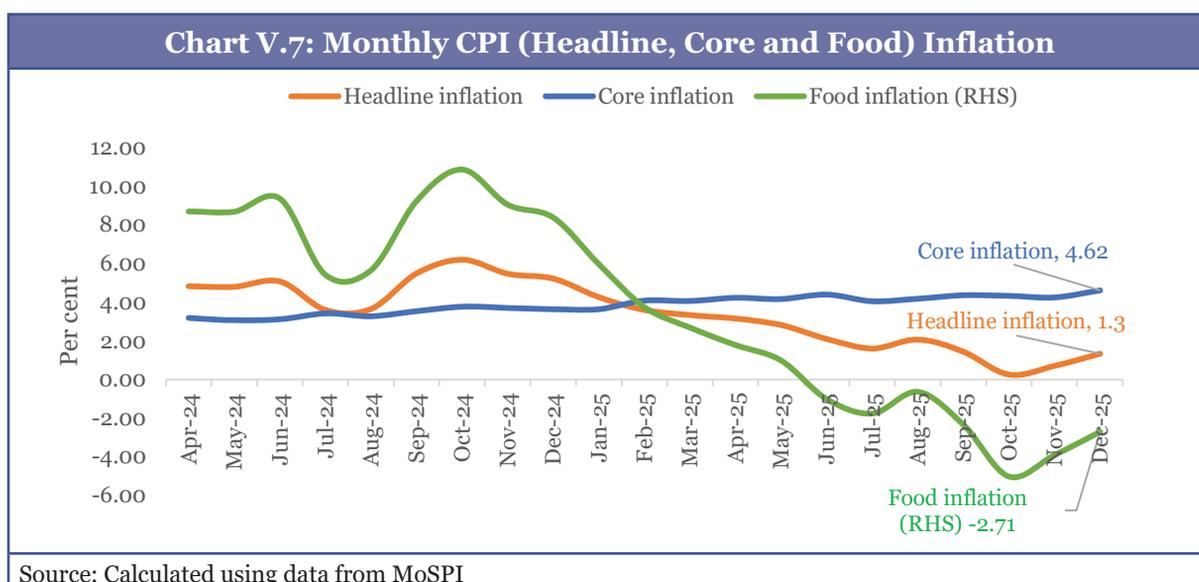
### Sustained moderation in retail inflation

5.8. Over the past four years, average retail inflation, as measured by the Consumer Price Index (CPI), has followed a clear downward trajectory (Chart V.6), declining steadily from 6.7 per cent in the financial year (FY) 2022–23 to 1.7 per cent in 2025–26 (up to December). The pace of disinflation was particularly pronounced in the current year, given that inflation was at 4.6 per cent in 2024–25. In fact, April–December 2025 marked the lowest average inflation rate in the current CPI series. The factory-gate basic

price for producers, as measured by the Wholesale Price Index (WPI)-based inflation, has consistently been lower than CPI inflation in these years and has mirrored the broad disinflationary trend, while exerting a moderating effect on the CPI.

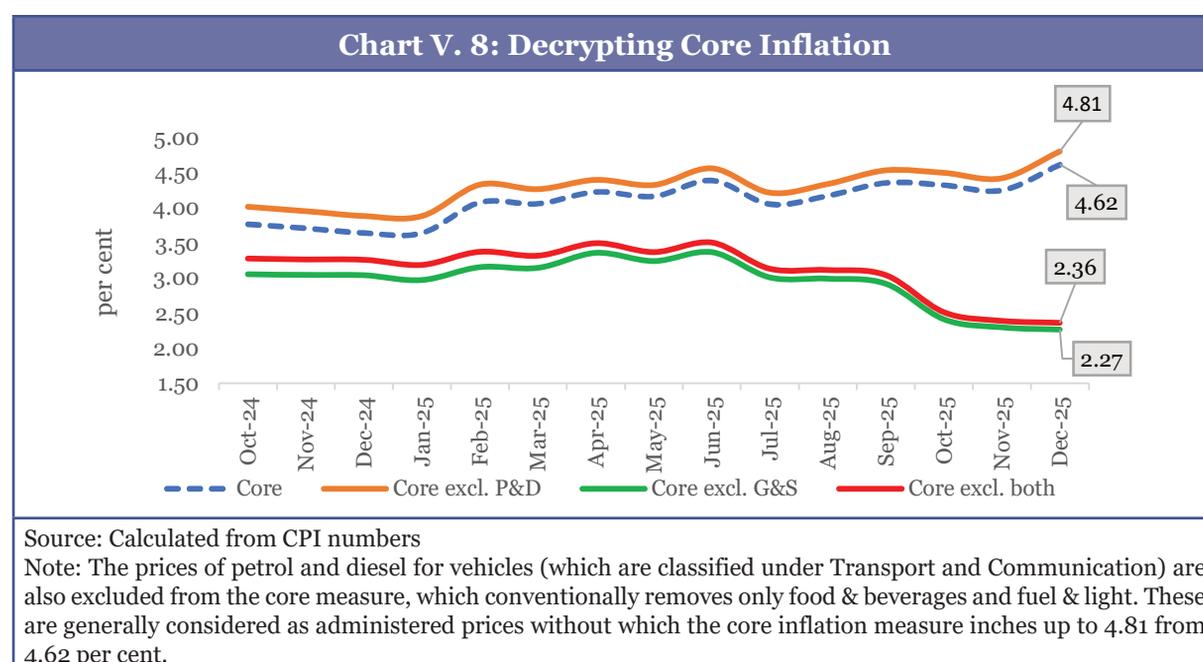


5.9. The current disinflationary phase commenced in October 2024, when retail inflation stood at 6.2 per cent. During the first half of 2025–26 (H1 of FY26), headline inflation declined sharply from 3.2 per cent in April 2025 to 1.4 per cent in September 2025, averaging 2.2 per cent over the period. Inflation eased further to 0.3 per cent in October 2025—the lowest reading in the current CPI (2012=100) series. This disinflation was driven primarily by the food items, reflecting favourable weather conditions and higher production that boosted supply (Chart V. 7). In contrast, core inflation—which excludes volatile components such as food and fuel—remained relatively stable and has shown a modest uptick during this period, rising from 3.8 per cent in October 2024 to 4.62 per cent in December 2025.



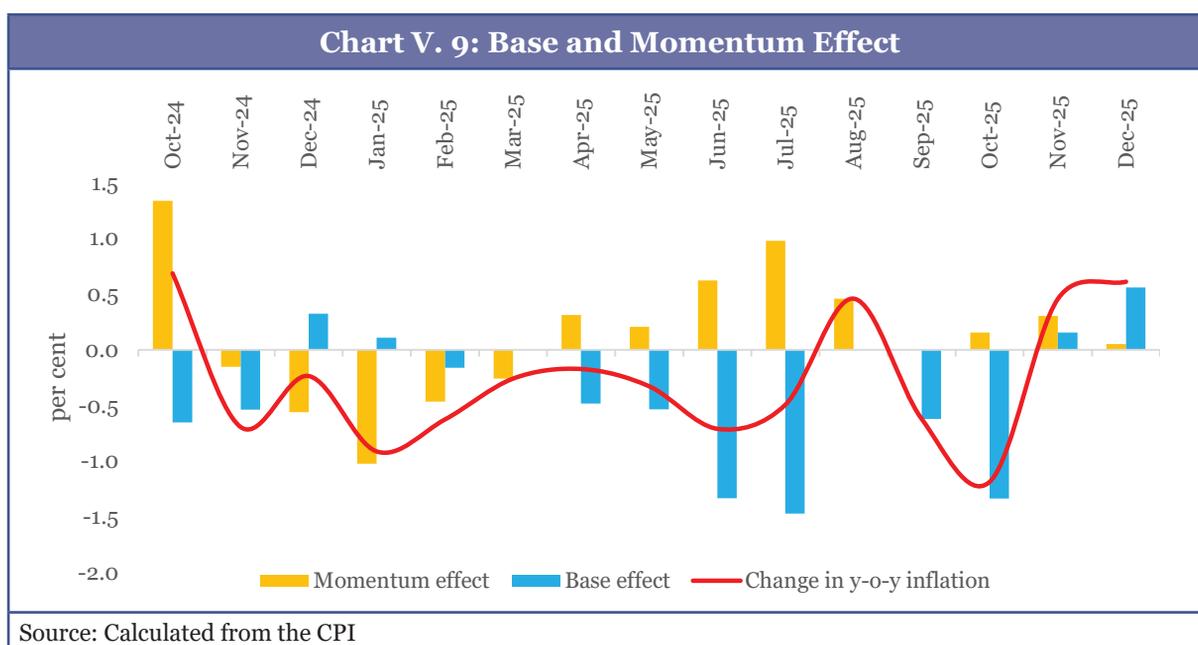
## Softening Core, if precious metals are excluded

5.10. The apparent divergence between headline and core inflation creates an impression of sticky core inflation, suggesting that underlying price pressures are firming even as headline inflation softens. The average reading of core inflation indeed shows an increase from 3.5 per cent in FY25 to about 4.3 per cent in FY26 (or a rise from 3.19 per cent in April 2024 to 4.62 per cent in December 2025), indicating persistence in non-food, non-fuel inflation. However, a more granular assessment reveals that this persistence is largely driven by sharp increases in the prices of precious metals—gold and silver—which have touched lifetime highs amid heightened global uncertainty and strong safe-haven demand. When these components are excluded, core inflation exhibits a declining trajectory, broadly mirroring the moderation in headline inflation (Chart V. 8). The resulting wedge between usual core inflation and these adjusted core measures amounts to approximately 235 basis points (excluding only precious metals) and 226 basis points (excluding both precious metals and the effects of petrol and diesel prices on the core). Notably, between June and December, core inflation excluding precious metals decelerated from 3.4 per cent to 2.3 per cent, even as the standard core measure remained elevated at around 4.6 per cent. This divergence indicates that the recent firmness in core inflation primarily reflects price pressures from precious metals rather than a broad-based strengthening of underlying inflationary momentum.



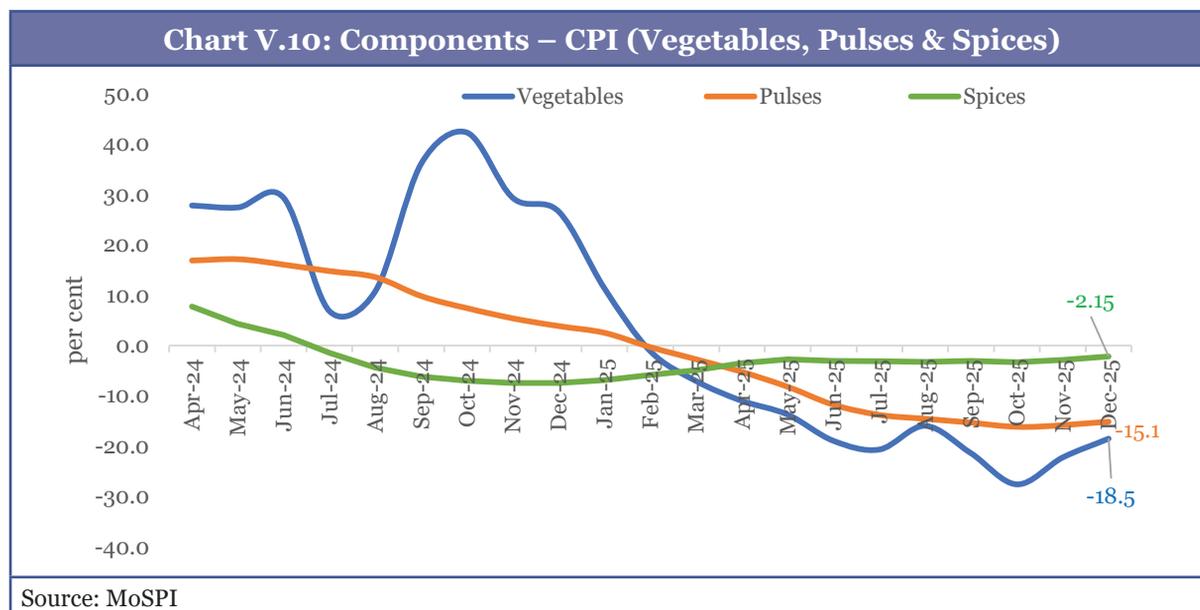
## Dominance of the base effect

5.11. Inflation can be decomposed into two components: the momentum effect and the base effect. The momentum effect captures the month-on-month price changes in the current year, while the base effect reflects the influence of price movements in the corresponding months of the previous year on year-on-year inflation. In FY26, the base effect played a dominant role in shaping the inflation trajectory, with its downward influence outweighing the momentum effect in seven out of nine months, thereby exerting significant disinflationary pressure (Chart V. 9). Although price pressures did emerge during the year, they were relatively contained and confined to a few months.



## Drivers of Food Disinflation

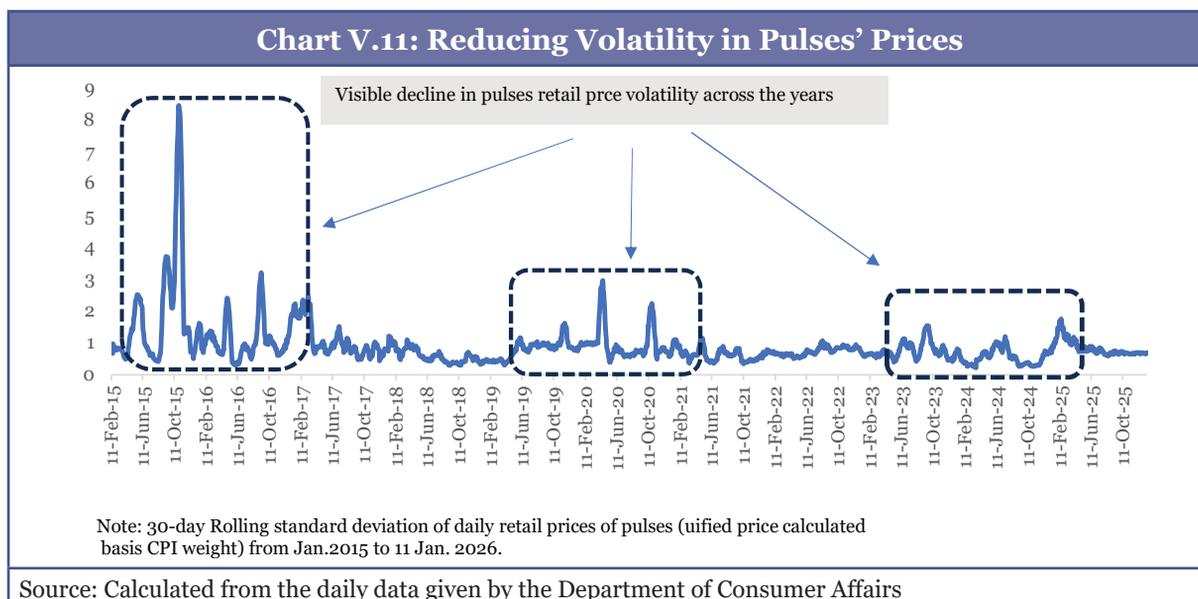
5.12. As shown in Chart V. 7, food inflation experienced a steady decline throughout the year, entering deflationary territory since June 2025. In fact, October 2025 witnessed the biggest monthly decline of (-) 5.02 per cent in the present CPI series. The sharp moderation was driven primarily by a sustained and steep decline in vegetable prices, which remained deeply negative for much of the year, alongside a continuous fall in pulses inflation over nearly nine months (Chart V.10). Spice prices also remained in deflation for an extended period of 18 months, though the magnitude of decline was relatively modest. Inflation in cereals had been declining throughout the year, from 6.2 per cent in January 2025 to merely (-) 0.4 per cent in December 2025. Together, these trends in key food components contributed significantly to the unprecedented easing of overall price pressures during the year.



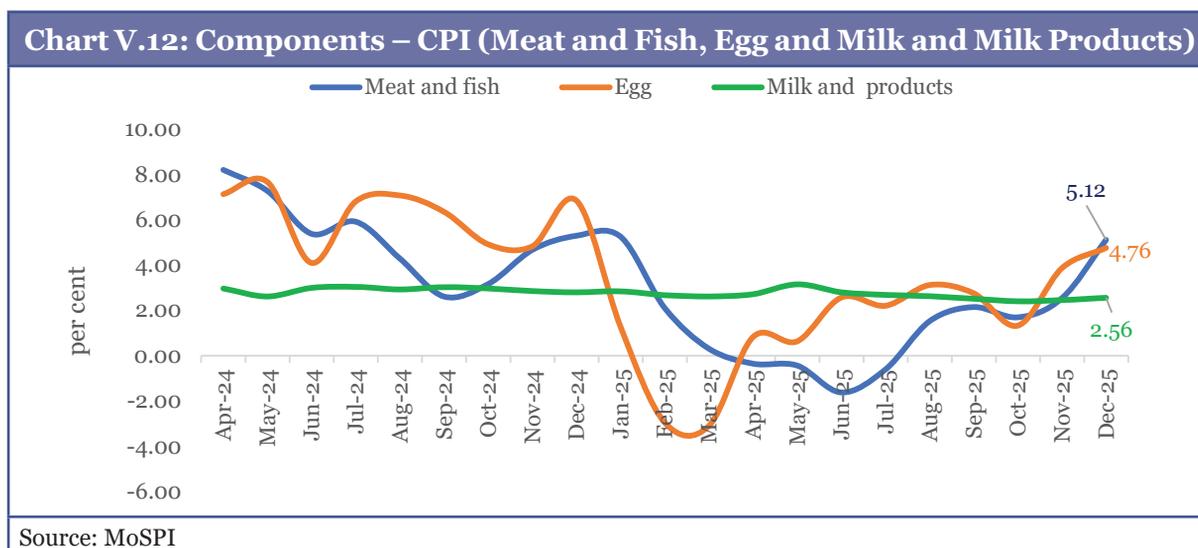
5.13. Prior to the recent moderation, pulse prices had remained elevated for several months during 2023 and 2024, reflecting production shortfalls and low carry-forward stocks that exerted significant upward pressure on prices. With domestic production recovering, supported by stable imports and an improved stock position, pulse's inflation began to ease in the current year.

5.14. Given that India's pulses market is structurally characterised by excess demand, the Government closely monitors mandi prices using analytical tools to obtain early signals of price movements, enabling timely policy responses to pre-empt retail price volatility. In this context, considering the expansion in tur acreage, procurement of 6.5 lakh metric tonnes in the previous season, and higher global exportable surplus, an import duty of 30 per cent on yellow peas, (a close substitute product for chana) was imposed in October 2025—ahead of the chana sowing season—to safeguard farmer interests, support domestic prices, and avoid sharp price corrections. Similarly, imports of masoor and chana (Bengal gram) are currently subject to a 10 per cent import duty.

5.15. Overall, timely trade policy decisions, strategic buffer stock management, and targeted market interventions have enabled effective management of the pulses price cycle, with retail price volatility moderating over the past decade, even in years of production shortfall. The degree of volatility in prices of pulses has been much lower during 2022-24 in comparison with 2015-17, despite a similar level of challenge in the domestic production front, as is evident from Chart V.11 below:

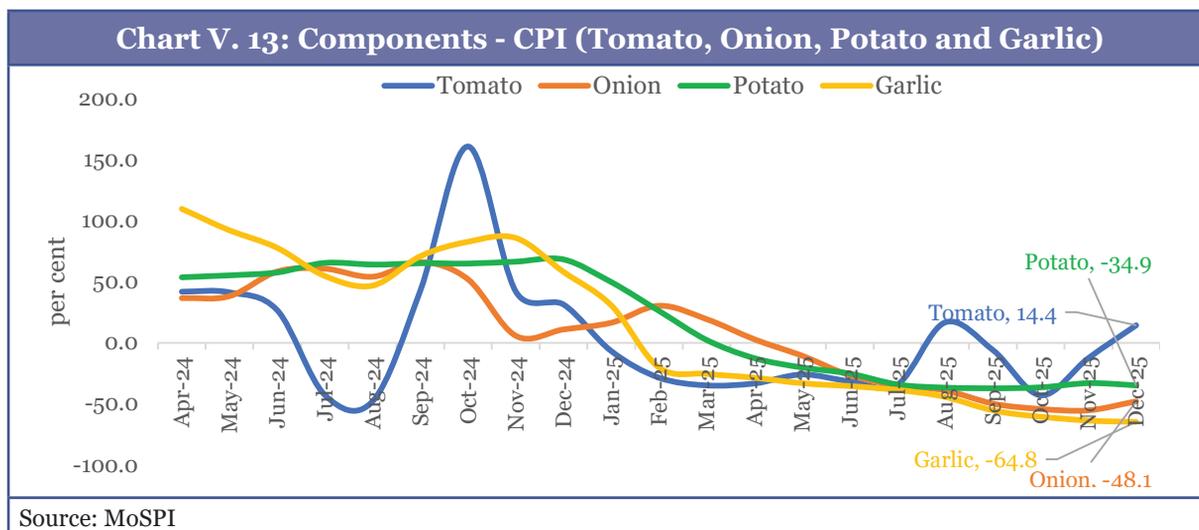


5.16. In the food basket, the prices of protein-rich food items such as eggs, meat and fish had declined for some months, but recovered soon in the later months (Chart V. 12). Inflation in milk products, however, remained stable at around 2.6 per cent.

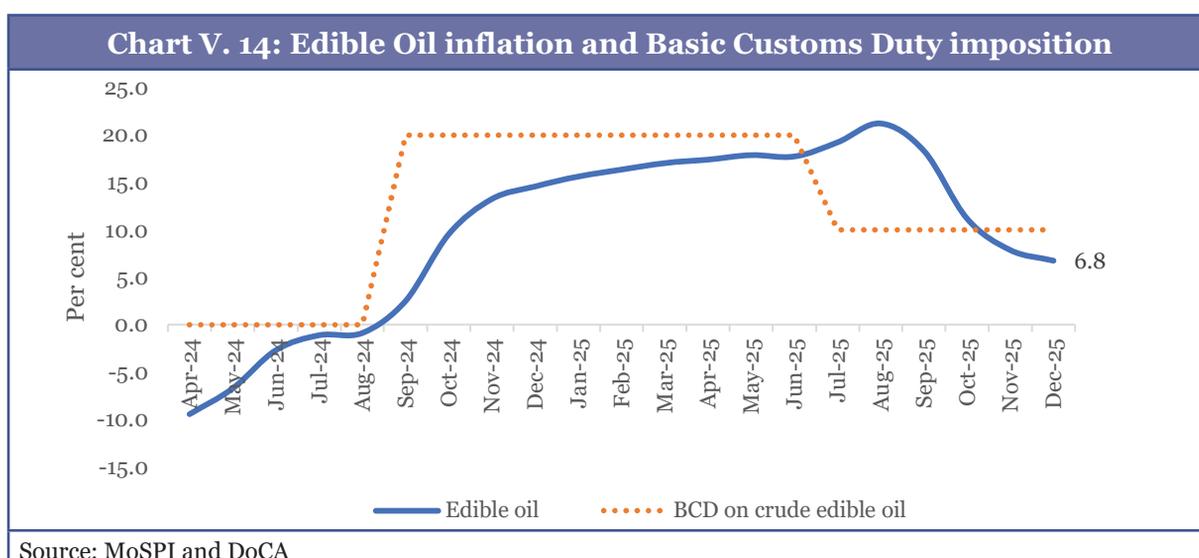


5.17. Unlike the previous year, horticultural commodities did not witness a surge in inflation during the current year; instead, their prices declined sharply. The contraction was particularly pronounced for potatoes, onions, tomatoes, and garlic, with price fall ranging between 20 and 40 per cent (Chart V.13), while deflation in other vegetables was more moderate. Owing to seasonality in production and arrivals, their perishable nature, and susceptibility to weather shocks, prices of these commodities tend to be highly volatile. Given the central role of TOP commodities (tomatoes, onions and potatoes) in the consumption basket of Indian households, the Government actively intervenes to contain excessive price fluctuations through buffer stocking and market release operations. In 2025–26, onion buffer stocks were released from September

2025 through direct retail sales to consumers at discounted prices, as well as supplies to mandis and wholesale markets in major consumption centres. Additionally, the use of rail transport for onion movement—initiated in 2024–25—was further scaled up in 2025–26 to ensure more cost-effective and efficient market intervention.



5.18. Amid the sharp disinflation observed across several food items, the experience of edible oils stands out. The edible oil market in India is characterised by structural excess demand, with over 50 per cent of domestic consumption met through imports, rendering domestic prices highly sensitive to global price movements, exchange rate fluctuations, and trade policy changes. In response to sharply falling prices, the Government imposed a basic customs duty (BCD) of 20 per cent on crude edible oils in September 2024, which helped support domestic prices. Subsequently, with prices rising again in FY26, the duty was reduced to 10 per cent in June 2025 to alleviate upward price pressures. The impact of this reduction is evident, as the pace of edible oil inflation has moderated since August 2025 (Chart V. 14).



## **Agricultural activity creates a benign environment for inflation**

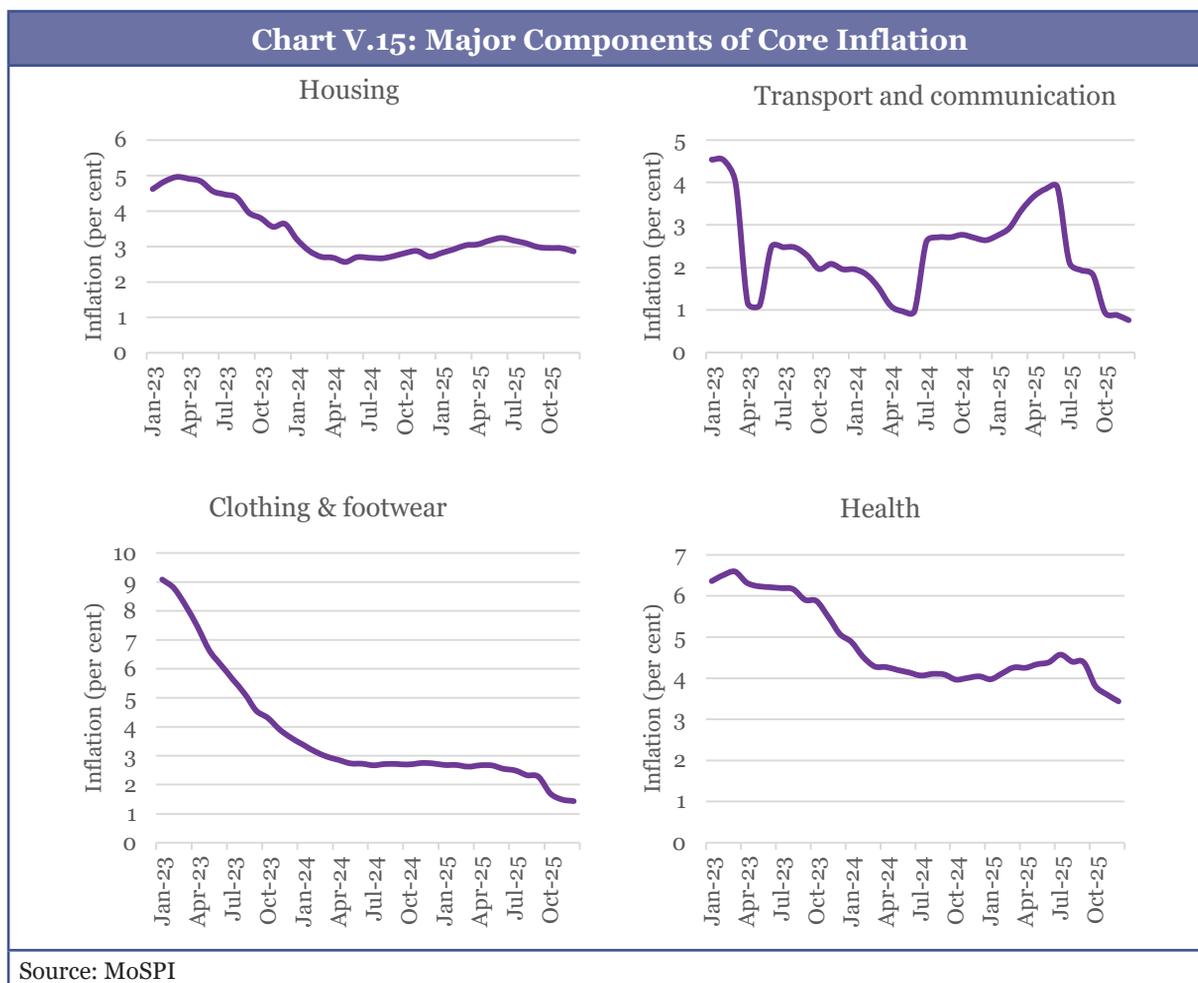
5.19. The agricultural outlook in FY26 has been broadly favourable for inflation outcomes. The precipitation levels were generally supportive, with about 30 states/UTs recording normal or excess rainfall. Cereal production reached a record high of about 3,320 lakh tonnes in 2024–25, supported by strong yields in rice, wheat, and coarse cereals. For 2025–26, the first advance estimates—covering only the kharif season so far—place cereal output at around 1,659 lakh tonnes. Pulses production recorded modest gains in 2024–25, reaching approximately 257 lakh tonnes, although variability across individual crops persisted. Oilseeds registered a sharp increase, with output of the nine major oilseeds rising to around 430 lakh tonnes in 2024–25, led by soybean, groundnut, and rapeseed–mustard.

5.20. Rabi sowing in the current year exceeded last year’s levels, with total cropped area expanding by 3.3 per cent year-on-year (as of 16 Jan 2026), supported by improved reservoir storage and soil moisture conditions. Pulses’ acreage increased (3.8 per cent), led by expansion in the area under gram cultivation. Oilseeds sowing rose by 3.5 per cent, driven by an expansion in rapeseed/mustard and safflower, which is expected to support edible oil availability, even as groundnut and sesamum acreage declined. Overall, the foodgrain area increased by 3.0 per cent, indicating a good Rabi season and strengthened food security.

## **Drivers of Core inflation**

5.21. The four major components of the core CPI basket – (i) clothing and footwear, (ii) housing, (iii) health and (iv) transport and communication – account for nearly one-third of the CPI basket and more than 60 per cent of the core measure. The price movements in these components, therefore, play an important role in shaping the behaviour of core inflation. Over the past two years, inflation has been gradually easing in three of the four components, while fluctuating in the fourth. Since Q2 of FY26, signs of disinflation appeared in these components other than housing (Chart V.15).

5.22. Housing inflation declined steadily through 2023 and early 2024 and thereafter stayed stable. This pattern reflects the nature of rental and housing-related prices, which are typically revised infrequently (often annually) and are influenced by negotiated agreements rather than spot market conditions. Health inflation shows a similar profile, with a gradual easing from higher levels in 2023 to lower and more stable levels thereafter. Prices in this category may be shaped by service delivery costs, administered fees, and institutional pricing practices, which tend to adjust slowly over time. As a result, these categories contribute stability to the core basket. Further, since July 2025, it has been experiencing moderation.



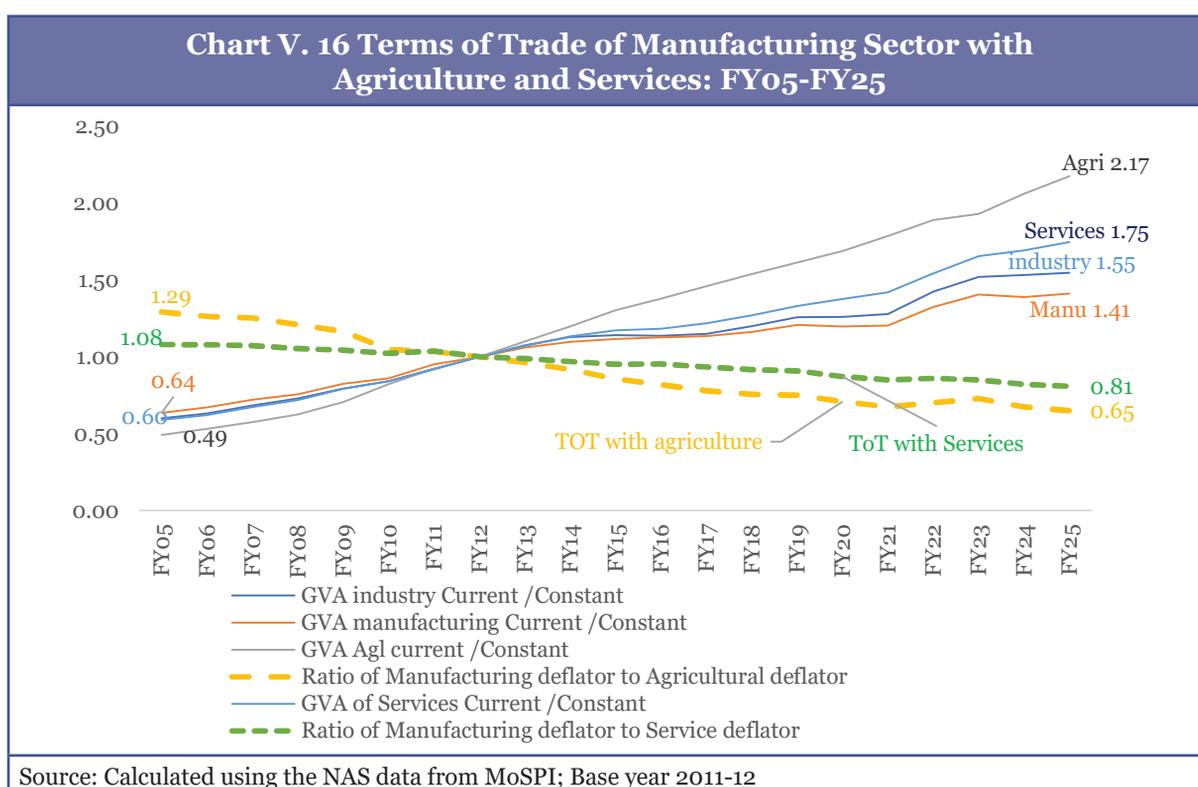
5.23. Inflation in ‘clothing and footwear’ fell sharply from elevated levels in early 2023 to lower levels by 2024-25. This disinflation reflects easing input costs, improved supply conditions and competitive pressures in goods markets where prices adjust more frequently. Unlike housing and health, prices in this category respond relatively quickly to changes in costs and demand, allowing inflation to decline when pressures abate. Transport and communication inflation, by contrast, remains lower on average but exhibits episodic movements. These short-lived fluctuations are driven by specific sub-components, such as fares, fuel-linked services, and changes in telecom pricing. However, since June 2025, disinflationary trends have appeared in the transport and communication component.

## GDP DEFLATORS: MANUFACTURING’S REVERSAL IN TERMS OF TRADE

5.24. The GDP deflator is a broad measure of general price level in an economy. It is defined as the ratio of nominal GDP to real GDP. Unlike CPI or WPI, it reflects economy-wide price movements, including in services and changes in the composition of output,

making it a comprehensive indicator that can be used to understand inflationary or deflationary pressures in the economy.

5.25. Following the logic of GDP deflators, one could find the implicit price deflator for a sector as the ratio of its Nominal or Current price GVA to Real or Constant price GVA. It's essentially a price index for that sector, pivoting around the base year with a value of 1 as the current and constant price values remain the same for the base year in a data series. The ratio of manufacturing to agriculture sector deflators tells how manufacturing prices have moved relative to agricultural prices. If the ratio is greater than 1, then Manufacturing prices are higher relative to agricultural prices, which implies better terms of trade for manufacturing and vice versa.



5.26. It is observed that the agricultural GDP deflator has grown faster than the other sectors (Chart V.16). By FY25, it is at 2.17 relative to the 2011–12 base year. The GDP deflators of Industry and Manufacturing rose at a slower pace — 1.55 for industry and 1.41 for manufacturing by FY25, while that of services was better off at 1.75.

5.27. Accordingly, the terms of trade for the manufacturing sector with respect to the agriculture sector, i.e., the ratio of the Manufacturing Deflator to the Agricultural Deflator, starts high (~1.29 in FY05) and steadily declines by 50 per cent to 0.65 in FY25, while its ratio with the service sector deflator declines by 25 per cent to 0.81 by FY25. Unlike agriculture, where prices may have risen due to the prevalence of government support, which sees an annual guaranteed price increase, or services, which enjoy more

pricing power, manufacturing is usually characterised by global competition, cost-cutting technologies, and narrower margins, which might be accounting for this decline in terms of trade.<sup>2</sup>

5.28. This declining terms of trade also translates as lower share of manufacturing in the GVA in current price terms, which has seen a decline from 17-18 per cent two decades ago to around 14 per cent in FY25, while its share in GVA in constant price terms and share in Gross Value of Output (GVO) have remained fairly constant at 18 per cent and 38 per cent, respectively.

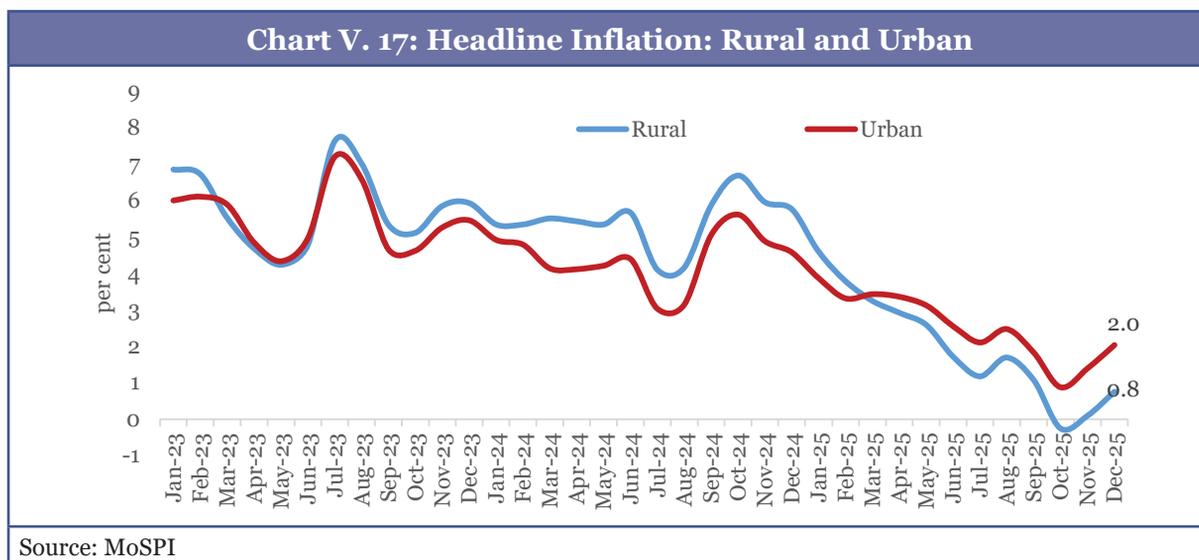
5.29. Better terms of trade in favour of agriculture might encourage resource shift towards agriculture, i.e., more land put to agricultural use, labour going back to agriculture, the evidence of both of which is visible in the Indian economy. On the other hand, declining relative prices for manufacturing mean that the sector might face tighter margins as input costs (especially those from agriculture) rise, and this could deter investment if it is prolonged. However, profit margins of India Inc have not shown any signs of stress, indicating the adoption of other cost-cutting or labour-saving innovations to preserve competitiveness. This also underscores the requirements for “Farm-to-Fork” policies that streamline the supply chain from producers to consumers—emphasising freshness, local sourcing, and fewer intermediaries, thereby reducing overall cost in the economy.

## INFLATION: REGIONAL PICTURE

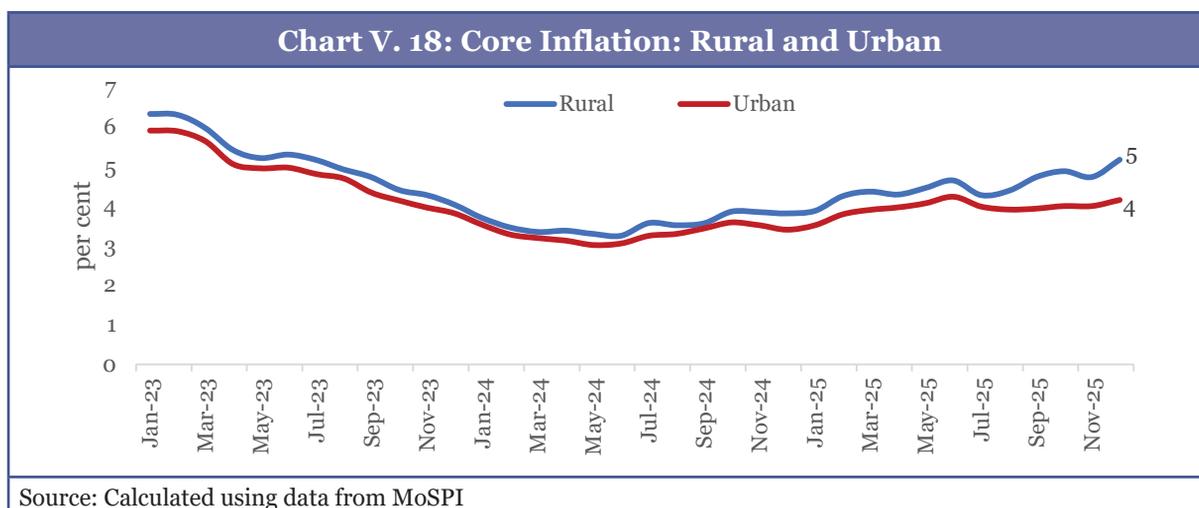
### Rural vs Urban Inflation

5.30. Throughout much of 2023 and 2024, rural inflation remained above urban inflation (Chart V. 17). This pattern reflects differences in consumption weights across rural and urban baskets, particularly the larger share of food items in rural consumption, which renders rural inflation more responsive to movements in food prices. Elevated inflation during 2023 and mid-2024 coincides with food price pressures, during which the rural-urban gap widened. As food inflation eased in 2025, inflation declined across both sectors, with inflation in the rural sector going below that in the urban sector. As food prices are more volatile, rural inflation across the states has shown greater volatility than inflation in urban areas.

<sup>2</sup> Anantha Nageswaran, V and Rose Mary K Abraham (2025). Industrial Outlook: The Share of Manufacturing in India’s Economy can Easily Expand, The Livemint, September 8. <https://tinyurl.com/ypk9ctt2>



5.31. In contrast to headline inflation, core inflation in rural and urban areas follows a smoother and more gradual adjustment path, declining steadily through 2023 and early 2024 before stabilising within a relatively narrow range thereafter (Chart V. 18). Rural core inflation remains marginally higher than urban core inflation, but the gap is modest and stable, indicating broadly similar pricing behaviour and demand pattern across regions once volatile food and fuel components are excluded.



## STATE-LEVEL DYNAMICS

5.32. The state-level incidence of inflation in 2025-26 (April-December) followed the national trend, with an across-the-board reduction in inflation, except in Kerala and Lakshadweep, where retail inflation breached the upper tolerance band of 6 per cent. In the rest of the states, average inflation remained within the 2-6 per cent tolerance band of the Reserve Bank of India, or below that (Table V. 1). Overall, the clustering of State-level inflation outcomes within the tolerance band suggests increasing synchronisation

of inflation across States, with residual deviations largely driven by local relative-price movements rather than broad-based inflationary persistence.

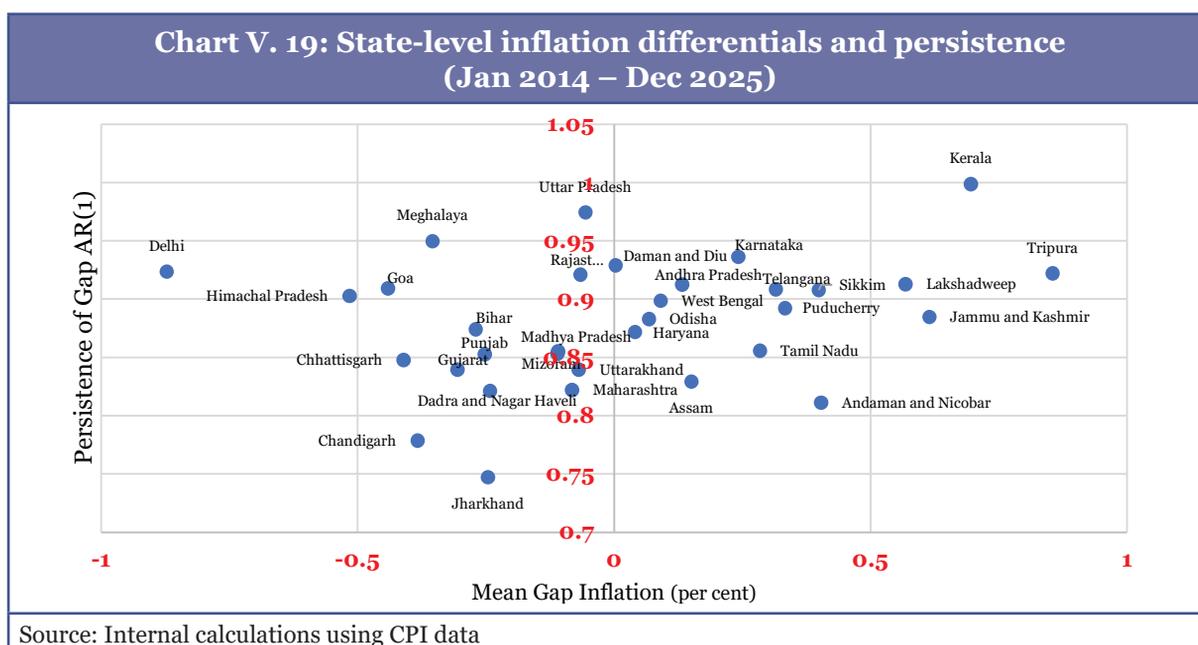
**Table V. 1: Headline Inflation in States /UTs**

States/UTs	2022-23	2023-24	2024-25	2025- 26 (Apr-Dec)
Andaman and Nicobar Islands	6.12	3.47	2.73	2.16
Andhra Pradesh	7.57	5.54	4.41	1.39
Assam	6.54	4.59	5.06	0.16
Bihar	5.74	5.84	6.04	0.01
Chandigarh	5.87	4.28	4.25	1.95
Chhattisgarh	4.72	3.43	5.78	1.25
Dadra and Nagar Haveli	6.43	6.49	4.75	0.36
Daman and Diu	5.62	4.83	4.88	2.60
Delhi	4.00	2.55	2.40	0.96
Goa	3.16	2.94	3.54	4.77
Gujarat	6.94	5.70	4.42	1.31
Haryana	7.51	6.60	5.23	1.61
Himachal Pradesh	4.51	5.04	4.04	2.17
Jammu and Kashmir	6.34	4.15	4.48	3.60
Jharkhand	6.16	5.73	3.78	1.29
Karnataka	5.49	5.79	4.93	3.14
Kerala	5.79	4.97	5.89	8.05
Lakshadweep	7.28	3.57	3.05	6.69
Madhya Pradesh	7.48	4.36	4.74	0.75
Maharashtra	7.33	5.12	4.07	2.13
Manipur	1.43	9.96	6.50	-0.15
Meghalaya	4.28	4.07	4.03	1.50
Mizoram	7.89	4.46	3.37	2.47
Nagaland	6.06	3.36	3.99	2.79
Odisha	6.02	6.54	5.98	0.12
Puducherry	6.20	5.28	4.74	2.58
Punjab	6.08	5.53	4.16	3.27
Rajasthan	6.92	6.39	4.34	0.81
Sikkim	6.81	3.52	2.45	1.60
Tamil Nadu	5.95	5.42	4.65	2.45
Telangana	8.61	6.36	3.67	0.20
Tripura	6.98	6.07	4.60	0.57
Uttar Pradesh	7.07	5.76	5.30	0.30
Uttarakhand	6.51	5.56	4.19	2.16
West Bengal	7.09	4.47	3.87	1.52
All India	<b>6.66</b>	<b>5.36</b>	<b>4.63</b>	<b>1.72</b>

Source: MoSPI

5.33. Using monthly State-wise CPI inflation data from January 2014 to December 2025, Chart V. 19 examines how inflation outcomes across states compare with the All-India average and whether such differences tend to persist over time, i.e., whether some states consistently have higher or lower inflation than the national average. The horizontal axis shows the average difference between a State’s inflation rate and the national average, called as mean gap inflation<sup>3</sup>, while the vertical axis captures the persistence of these differences, indicating whether inflation gaps tended to fade quickly or carry over into subsequent months.

5.34. The chart suggests that inflation differentials across States were not purely transitory. All States exhibited positive persistence, implying that deviations from the national average often extended beyond a single month.<sup>4</sup> Far-end States in the South and Northeast tended to have recorded inflation above the national average, with relatively higher persistence. States such as Delhi and Himachal Pradesh, on the other hand, were typically below the national average, with comparable persistence. Several States clustered close to the national average, though with differing degrees of persistence.



5.35. Overall, the pattern suggests that while national factors remain central in shaping inflation outcomes, State-level inflation dynamics display heterogeneity over time. An

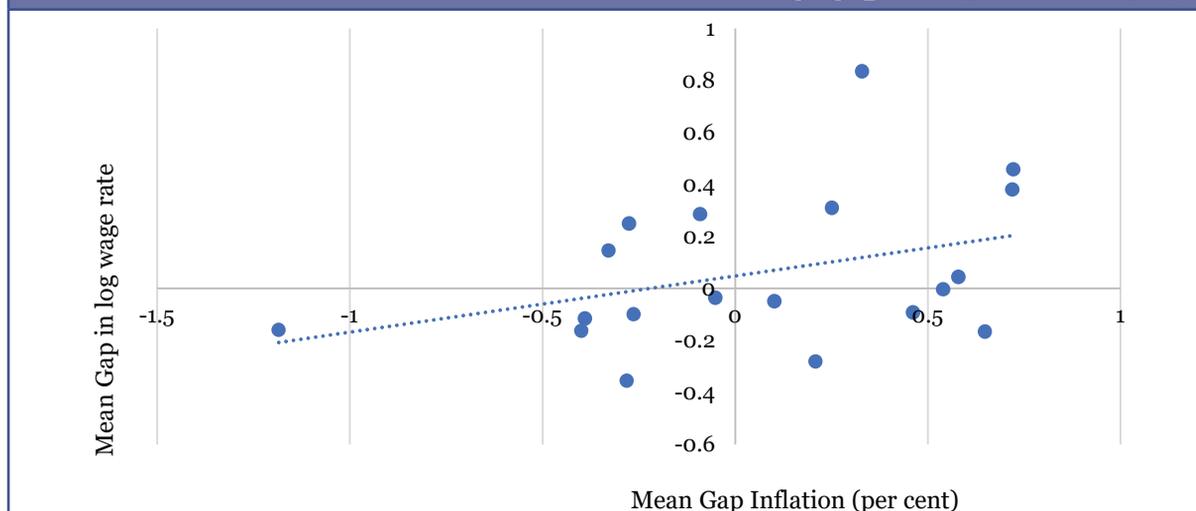
3 For any state, the inflation differential is calculated as difference between the mean state inflation and mean national inflation. This is also referred as ‘mean gap inflation’.

4 Mathematically, for each State  $s$ , the inflation differential  $d_{s,t}$  is modelled as:  $d_{s,t} = \alpha_s + \rho_s d_{s,t-1} + \varepsilon_{s,t}$  where  $d_{s,t}$  is the inflation differential for State  $s$  in month  $t$ ,  $\alpha_s$  is a State-specific constant,  $\rho_s$  is the Auto Regressive [AR(1)] coefficient which indicates the strength and direction of the relationship between the current value of a series and its immediate past value, representing the "memory" or persistence of the series, and  $\varepsilon_{s,t}$  is error term. A value of  $\rho_s$  closer to 1 implies that deviations adjust gradually and tend to persist over time. A lower value of  $\rho_s$  implies that deviations diminish more quickly. A positive value of  $\rho_s$  indicates that deviations tend to move in the same direction across consecutive periods.

examination of inflation and wage rates at the state-level over a decade indicates that the states with an average wage rate above the national wage (i.e. positive mean wage gap) tend to experience a relatively higher inflation (i.e. a positive mean gap inflation) (Chart V. 20). A recent study has also highlighted the significance of wage rates in increasing inflation disparity across the states.<sup>5</sup> Our further analysis demonstrated that the state-level inflation rates show a significant positive association with wage rates, state-level GDP growth rates and COVID impact (indicating inflation increases with the increase in wage rate and GSDP growth rate, and that COVID had a structural step-up influence on the price situation). However, the share of industrial output showed some negative association with the state-level inflation, reflecting the benign effect of supply-side efficiencies in manufacturing sector in dampening price pressures. GST imposition was found to be price neutral for state-level inflation differential. Variables such as weighted average lending rate, fiscal deficit ratio and credit intensity do not exhibit a robust independent association with inflation once state-specific and year-specific effects are accounted for in the 10-year duration. The share of agricultural output, did not seem to have a meaningful impact at the local level for the 10-year duration under study as production structures may be oriented more to national and export markets rather than flooding the local markets.<sup>6</sup> While the present results highlight important associations, they should be viewed as indicative rather than definitive, and need more comprehensive study incorporating a broader set of explanatory factors and their dynamics.

5 Ajit, Y and Taniya Ghosh (2024) Inflation convergence across Indian states, Working Paper-2024-014, Indira Gandhi Institute of Development Research (IGIDR), Mumbai (<https://tinyurl.com/yh3xf9rm>)

6 We estimated the following state level fixed effects panel regression model for the period 2014-15 to 2024-25, controlling for unobserved State-specific heterogeneity and common year effects. The model is  $\pi_{it} = \alpha_1 + \beta X_{it} + \delta_{1_{GST\_post}} + \delta_{2_{covid}} + u_{it}$ , where  $\pi_{it}$  is state-level inflation and  $X_{it}$  represents the vector of other independent variables such as, log of wage rate, weighted average lending rate, log of state-level GSDP, state's fiscal deficit ratio, share of agricultural output in state GVA, share of industrial output in state GVA, credit-deposit ratio in that state. Dummy variables were given for the Covid-19 years of 2020 & 2021 ( $\delta_{2_{covid}}$ ) and post-GST implementation period ( $\delta_{1_{GST\_post}}$ ) starting from 2018. While the wage rate and state-level GSDP growth were significant at less than 1 per cent level, the Covid dummy and share of industrial output were significant at less than 5 per cent and 10 per cent levels respectively. The standard errors were clustered at the State level.

**Chart V. 20: State-level inflation differential and wage gap (2014-15 to 2024-25)**

Source: Internal calculations using CPI numbers and state level data from Handbook of Statistics of Indian States (RBI)

## OUTLOOK FOR INFLATION

5.36. To conclude, the RBI and IMF have projected a progressive increase in headline inflation in the upcoming fiscal, bringing the levels within the targeted range of 4 per cent ( $\pm 2$  per cent). In December 2025, the RBI revised its inflation projections for FY26 from 2.6 per cent to 2.0 per cent, owing to a good kharif harvest and healthy rabi sowing. IMF has projected an inflation rate of 2.8 per cent in FY26 and 4.0 per cent in FY27. The RBI's forecast for headline Inflation for Q1 and Q2 of FY27 currently stands at 3.9 and 4 per cent.

5.37. The below-normal temperature experienced through most of the months in 2025 coupled with above-normal monsoon, which augmented reservoir levels, has favorably influenced kharif harvests, created strong sowing momentum in the ongoing Rabi season and improved the stock position of foodgrains.<sup>7</sup> These factors are likely to keep food inflation at moderate levels in the upcoming months. Furthermore, the government's efforts to increase fertiliser supply may help keep input prices in agriculture in check, thereby containing inflationary pressures in the food basket. The continued pass-through of GST rate rationalisation into commodity prices may also temper inflationary pressures on the cost side. The depreciation of the currency could pave the way for imported inflation. However, global commodity prices are expected to remain soft, thereby limiting the impact. According to the World Bank's Commodity Prices Outlook, October 2025, global commodity prices are expected to decline by approximately 7 per cent in FY27, primarily driven by subdued crude oil prices amid

<sup>7</sup> Damodaran, H (2026) How a 'Goldilocks combination' in agriculture has kept food inflation at bay, Indian Express, January 19, 2026. <https://tinyurl.com/bdf35s9s>

oversupply. Geopolitics may come in the way of this prediction, however. On the other hand, the prices of base metals, such as iron, copper, and aluminium, are expected to increase moderately. For instance, in copper, both demand pressures (especially given its usage for green technology and data centres) and supply disruptions might keep its price elevated. The prices of precious metals, both gold and silver, are likely to continue increasing due to their sustained demand as safe-haven investments amid global uncertainties, unless a durable peace is established and trade wars are resolved. Some commentators feel that the torrid pace set by gold and silver in 2025 may not be sustained. If they are correct, core inflation excluding precious metals may be higher, not lower. In conclusion, India's inflation rate – headline and core excluding precious metals – will likely be higher in FY27 than in FY26. However, we believe it is unlikely to be a concern.

\*\*\*

*This page has been left blank*

# AGRICULTURE AND FOOD MANAGEMENT: RAISING PRODUCTIVITY, SECURING INCOMES AND ENSURING FOOD SECURITY



*India's agriculture sector has shown robust growth in recent years. Given the large proportion of the population supported by the sector and its crucial role in food security, sustained agricultural growth is imperative for strengthening economic resilience, promoting rural prosperity, and ensuring food security. Government initiatives such as the Pradhan Mantri Krishi Sinchai Yojana (PMKSY), Rashtriya Krishi Vikas Yojana (RKVY), Agriculture Infrastructure Fund (AIF), and Kisan Credit Cards (KCC), have helped enhance agricultural productivity, encourage crop diversification and increase farm incomes. Additionally, the buoyant growth of allied sectors has positively contributed to agricultural performance.*

*While there have been notable advancements in Indian agriculture, challenges that impact productivity and incomes still need to be fully addressed. Fragmented landholdings, inadequate marketing and storage infrastructure, limited access to quality inputs, relatively low levels of investment, and uneven quality of extension services are among the prominent reasons for the low productivity level. These factors collectively affect resilience and farmers' incomes. Certain measures aimed at enhancing fertiliser use among farmers, such as the urea subsidy, have led to increased application. This increased usage has been reported to impact soil productivity negatively.*

*This chapter examines these constraints while highlighting the policy measures and institutional interventions undertaken by the government to support farmers, enhance productivity, and strengthen market linkages. It also reviews key welfare schemes and income-support mechanisms designed to reduce risk and provide support.*

*Additionally, the chapter examines India's food management system, encompassing procurement, storage, and public distribution, to evaluate how food security objectives are achieved. It discusses the functioning of food procurement and distribution mechanisms to ensure stable supplies, provide price support for farmers, and ensure affordable access to foodgrains for consumers.*

## INTRODUCTION

6.1 Agriculture and allied activities contribute nearly one-fifth of India's national income at current prices, but account for 46.1 per cent<sup>1</sup> of the country's workforce. Given the relatively large share of employment in agriculture and allied activities, the sector remains central to India's overall growth trajectory. Strengthening agricultural performance is therefore important for inclusive growth and ensuring food security.

6.2 Indian agriculture has demonstrated resilience, registering steady growth with major growth coming from the allied sector. While food grain production has increased in recent years, higher-value allied sectors, such as livestock, fisheries, and horticulture, are assuming an increasingly important role in enhancing income opportunities and strengthening rural livelihoods.<sup>2</sup> At the same time, certain challenges persist, including fragmented landholdings, limited access to irrigation and quality inputs, low levels of mechanisation and investment, and stagnating yields across several crops and regions, which continue to limit productivity gains and farmer incomes.

6.3 The government is undertaking several interventions to improve productivity in agriculture and allied sectors through a mix of policy measures, including programmes for technology, input and income support, strengthening infrastructure and improvements in market linkages. Policy measures such as Krishonnati Yojana (KY) which is an umbrella scheme of 08 schemes-Mission for Integrated Development of Horticulture (MIDH), National Food Security and Nutrition Mission, (NFSNM), Sub-Mission on Agriculture Extension (SAME), Integrated Scheme on Agricultural, Marketing, Digital Agriculture Mission (DAM), National Mission on Edible Oil – Oilseed (NMEO-OS), National Mission on Edible Oil – Oilpalm (NMEO-OP) and Mission Organic Value, Chain Development for North East Region (MOVCDNER) which aim to promote the holistic, science-based development of agriculture and allied sectors to enhance production, productivity, and value realisation of farm produce.<sup>3</sup> Measures to improve diversification, and sustainability have also positively impacted productivity. In addition, the decision in 2018–19 to fix the MSP at 1.5 times the all-India weighted average cost of production is an important step that provides greater price certainty and assures farmers of a specified return.

6.4 Income support through Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), promotion of efficient input use and sustainable production practices through Per Drop More Crop (PDMC), encouragement towards the use of alternative and organic fertilisers, promotion of Farmer Producer Organisation (FPOs), Primary Agricultural

1 PLFS survey July 2023 to June 2024.

2 Negi, D. S., Birthal, P. S., Roy, D., & Hazrana, J. (2021). Crop choices in Indian agriculture: Role of market access and price policy. *Economic Bulletin*, 41(4), 2249–2256.

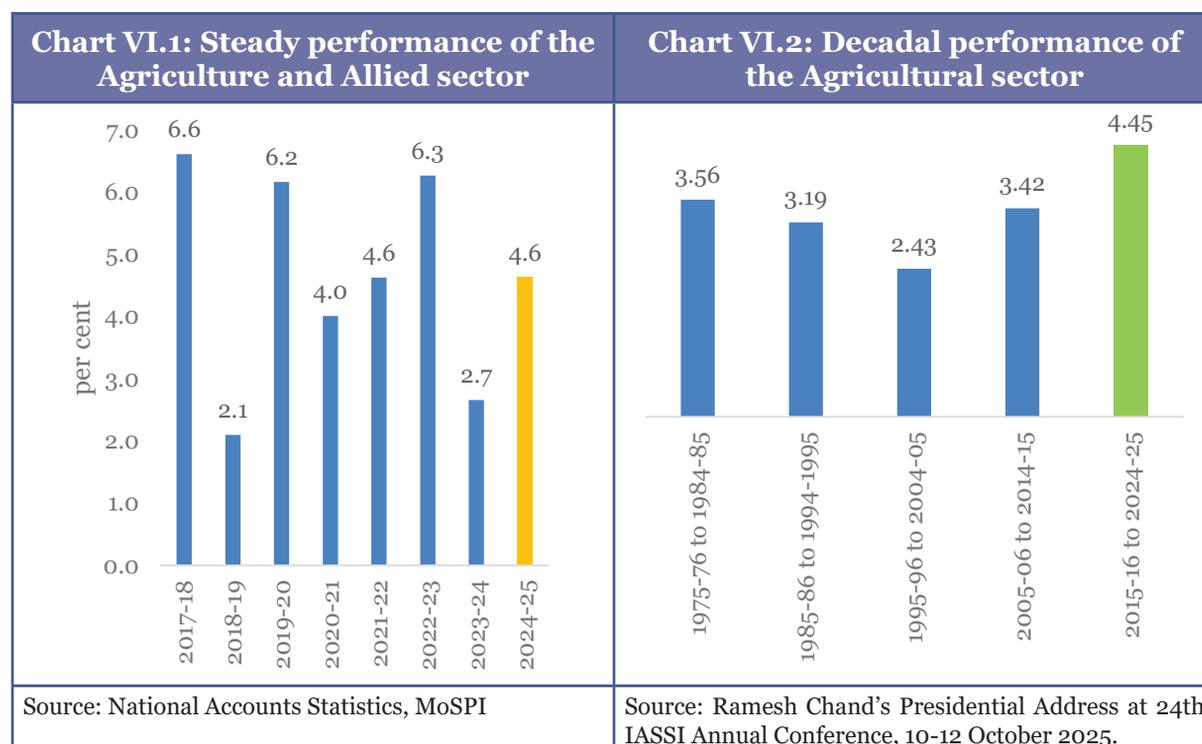
3 Lok Sabha Unstarred question 1258 answered on 11<sup>th</sup> February 2025.

Cooperative Societies (PACS), digital initiatives such as e-National Agriculture Market (e-NAM) have supported the sector.

6.5 This chapter analyses the performance of agriculture and related sectors in section 1, and productivity trends and regional disparities are examined in section 2. Sections 3, 4, 5 and 6 review policy interventions aimed at enhancing resilience, increasing productivity through input and technology interventions, and providing income and insurance support. The chapter then discusses the performance of the cooperative sector and discusses the interventions and achievements in sustainable agriculture in sections 8 and 9, respectively. Sections 10 and 11 review the Food Processing Industries and India’s food management framework respectively including procurement, storage, and public distribution. Section 12 concludes the chapter with recommendations.

## OVERVIEW OF AGRICULTURAL AND ALLIED SECTOR PERFORMANCE

6.6 Over the last five years, the average annual growth rate in the agriculture and allied sector has been around 4.4 per cent<sup>4</sup> at constant prices. In Q2 of FY 2025-26, the agriculture sector registered a growth of 3.5 per cent.<sup>5</sup> The decadal growth of 4.45 per cent (FY16-FY25), the highest in comparison to previous decades, has primarily resulted from the strong performance in livestock (7.1 per cent) and fishing and aquaculture (8.8 per cent), followed by the crop sector at 3.5 per cent.<sup>6</sup>



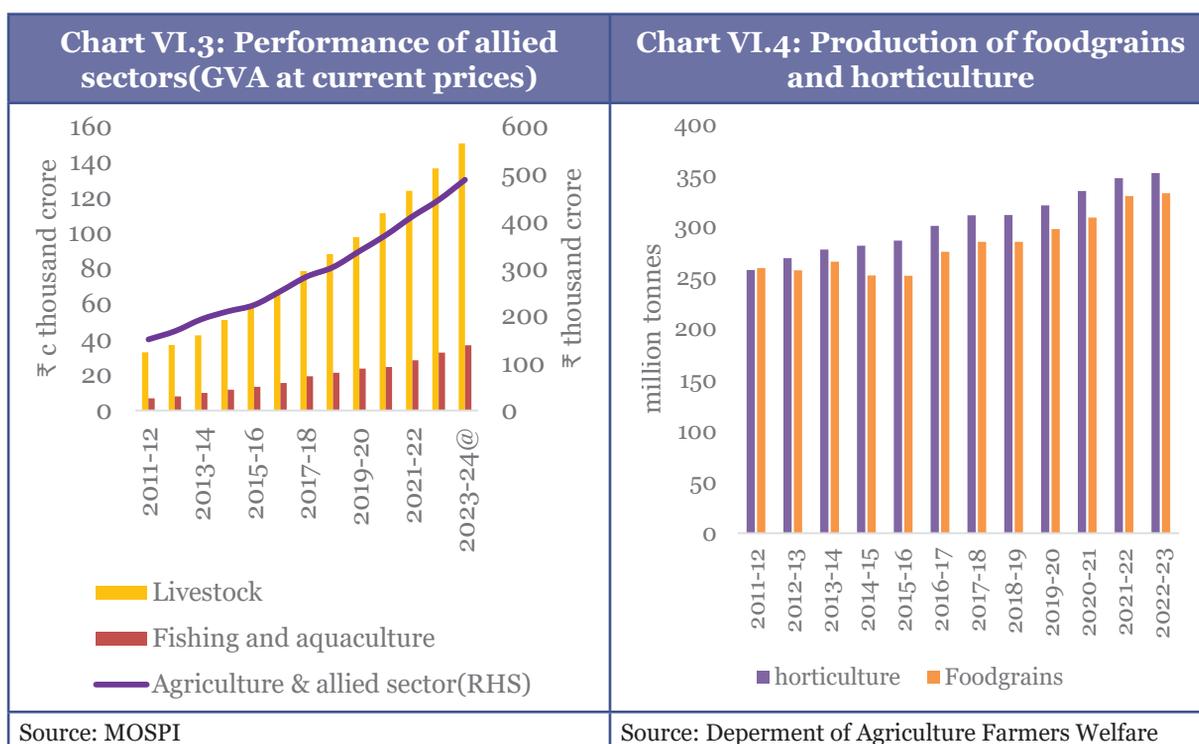
4 National accounts Statistics, MoSPI.

5 National accounts Statistics, MoSPI.

6 Ramesh Chand’s Presidential Address at 24th IASSI Annual Conference, 10-12 October 2025.

6.7 It is important to note that during FY 15 and FY24 the livestock sector recorded a strong expansion, with its GVA increasing by nearly 195 per cent, registering a compound annual growth rate (CAGR) of 12.77 per cent at current prices.<sup>7</sup> The fisheries sector has also performed well, with fish production increasing by more than 140 per cent (by 88.14 lakh tons) during 2014-2025, compared to the increase from 2004-14.<sup>8</sup> Thus, allied sectors are increasingly emerging as important growth engines and key contributors to enhancing farm incomes.

6.8 India’s foodgrains production has witnessed a steady increase, despite certain challenges. India’s foodgrain production is estimated to have reached 3,577.3 lakh metric tonnes (LMT) in Agriculture Year (AY) 2024–25, an increase of 254.3 LMT over the previous year. This growth has been driven by higher output of rice, wheat, maize and coarse cereals (Shree Anna).



6.9 The increase in production is attributed to the favourable monsoon across regions and the government's supportive policies. While food grain production has continued to expand, the horticulture sector, which accounts for approximately 33 per cent of agricultural GVA, has emerged as a bright spot in the country's agricultural growth trajectory. In 2024-25, horticulture production reached 362.08 MT, surpassing the estimated food grain production of 329.68 MT.<sup>9</sup> This underscores a gradual diversification of agricultural output towards high-value crops. As of August 2025,

7 Department of Animal Husbandry and Dairying.

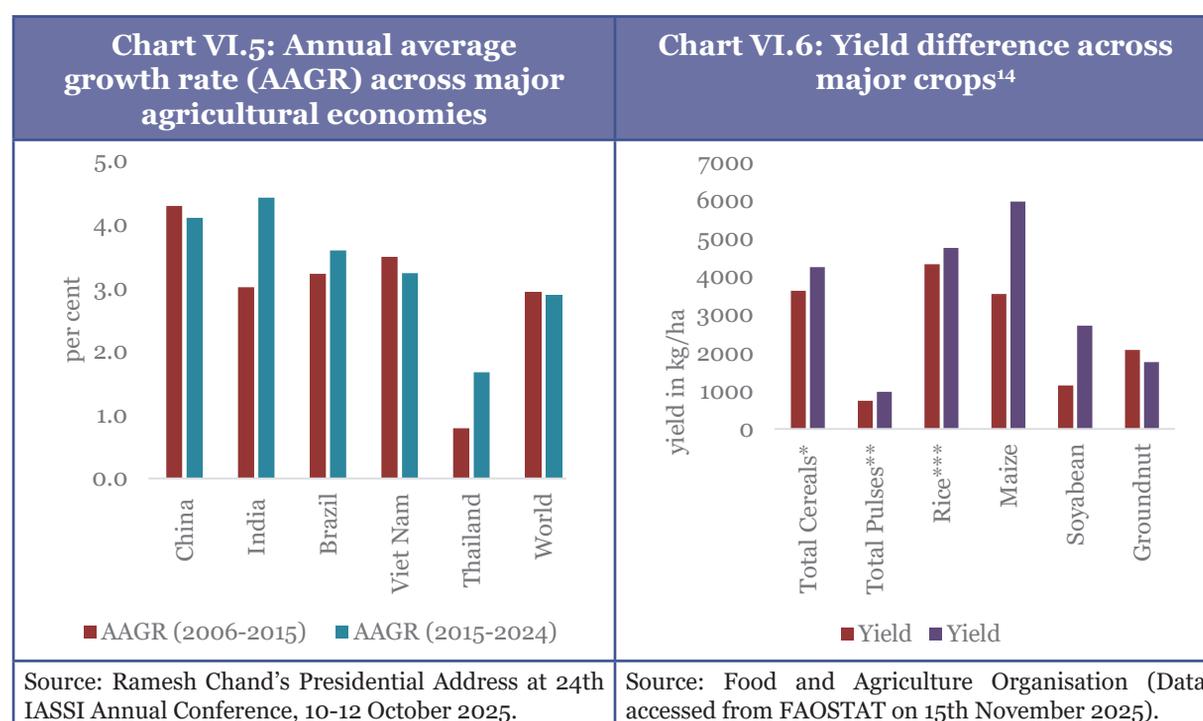
8 <https://pib.gov.in/FactsheetDetails.aspx?Id=149135&reg=3&lang=2>.

9 Department of Agriculture and Farmers Welfare.

horticulture production increased from 280.70 million tonnes in 2013–14 to 367.72 million tonnes in 2024–25 (second advance estimates).<sup>10</sup> This expansion has been broad-based, comprising 114.51 million tonnes of fruits, 219.67 million tonnes of vegetables, and 33.54 million tonnes from other horticultural crops, highlighting the sector’s growing contribution to agricultural output and value.<sup>11</sup> In addition, the country is the world’s largest producer of dry onions, contributing nearly 25 per cent of global output. India also ranks second worldwide in the production of vegetables, fruits, and potatoes, accounting for around 12-13 per cent of global output in each category.<sup>12</sup> These achievements underscore India’s strong presence in horticulture, its growing role in meeting global food demand, and the opportunities in high-value crop production.

### Productivity Trends: India in Global and Domestic Perspective

6.10 While the average annual growth rate (AAGR) in agriculture and allied activities has shown improvement, exceeding the global average of 2.9 per cent<sup>13</sup> over the same period, there remains substantial potential to enhance agricultural productivity. Yields across several crops, including cereals, maize, soybeans, and pulses, continue to trail global averages.



6.11 However, the yield in groundnuts is an exception, reflecting the concentration

10 <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/aug/doc2025831625101.pdf>.

11 Ibid.

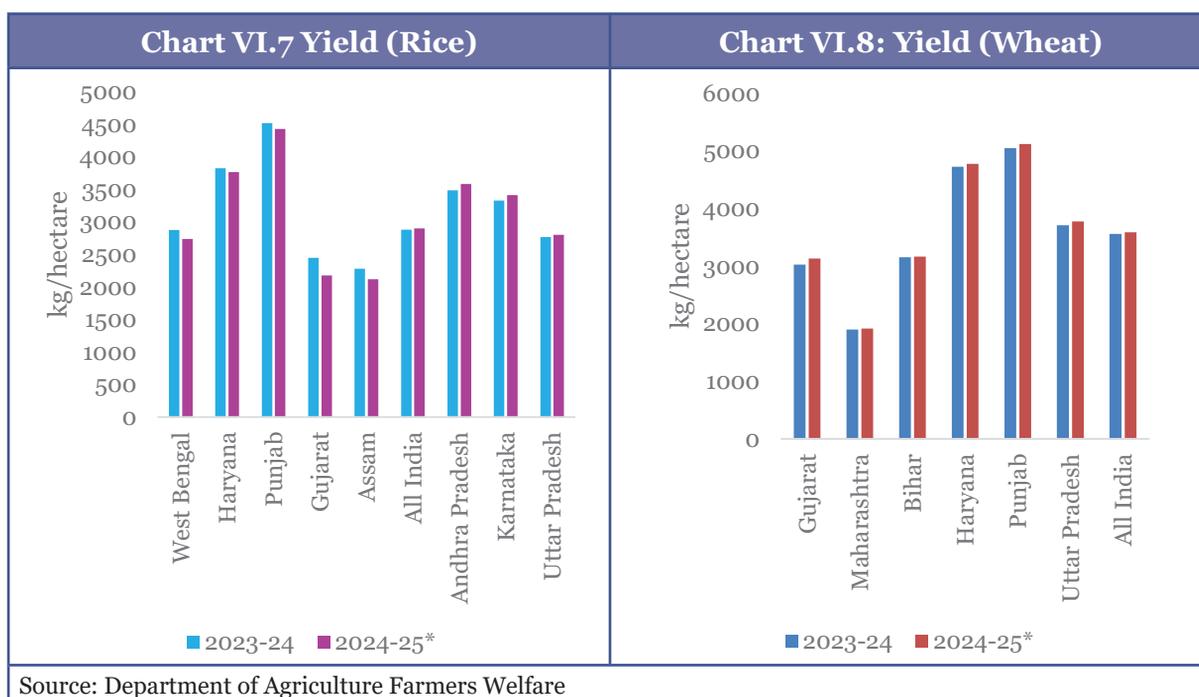
12 Agriculture Statistics at a Glance, 2023-24, Department of Agriculture and Farmers Welfare.

13 Ramesh Chand’s Presidential Address at 24th IASSI Annual Conference, 10-12 October 2025.

14 \*Total Cereals include paddy production, \*\*\*Pulses include imputed value of dry beans, \*\*\*Unmilled or rough rice (paddy).

of groundnut production in agro-climatically suitable semi-arid regions and a few high-performing states. The adoption of improved varieties, the presence of two crop cycles in some areas, and sustained policy focus on oilseeds, particularly in Gujarat, Karnataka, and Tamil Nadu, have together contributed to notable productivity gains.<sup>15</sup> In the case of soyabean, productivity is constrained by the predominance of rainfed cultivation, with yields in many districts below 2 tonnes per hectare.<sup>16</sup>

6.12 A report by the Commission for Agriculture Costs and Prices (CACP)<sup>17</sup> which compared yields per hectare across kharif crops over time and across states, found that many major rice-producing states such as West Bengal, Uttar Pradesh, Telangana, Odisha, Andhra Pradesh and Tamil Nadu had yield<sup>18</sup> per hectare lower than the national average. The report identifies that the major causes were unseasonal rains, heat stress, and dry spells during critical crop stages.



6.13 In the case of pulse, yields per hectare in India across states remained low due to persistent technological, structural, and climatic constraints, with the latter being a significant driver of low and unstable yields. According to a National Institution for Transforming India (NITI) report<sup>19</sup>, in 15 of the 27 El Niño years (in the period

15 Report of the Committee for Doubling Farmers’ Income Volume VIII “Production Enhancement through Productivity Gains”.

16 Sharma, B. R., Gulati, A., Mohan, G., Manchanda, S., Ray, I., & Amarasinghe, U. (2018). Water productivity mapping of major Indian crops.

17 Price Policy of Kharif Crops, for marketing season 2025-26, Commission for Agriculture Costs and Prices.

18 CACP calculated average yield in TE2023-24 and average annual growth in yield between 2019-20 and 2023-24 have been compared.

19 <https://www.niti.gov.in/sites/default/files/2025-09/Strategies-and-Pathways-for-Accelerating-Growth-in-Pulses-towards-the-Goal-of-Atmanirbharta.pdf>.

1951–2024), pulse acreage declined by 2-9 per cent<sup>20</sup>, production fell by 6 to 30 per cent, and yields dropped by 5 to 25 per cent year on year.<sup>21</sup> In contrast, during La Niña conditions, both acreage and production have<sup>22</sup> increased, along with productivity.<sup>23</sup> Madhya Pradesh (MP) and Gujarat are the top producers of pulses and also have higher yield<sup>24</sup> than other states, largely due to the agro-climatic conditions well-suited to major pulse crops. MP's black soils are particularly conducive to rotations based on gram, lentil, and soybeans, offering good moisture retention and nutrient availability. Gujarat's semi-arid regions support short-duration pulse varieties, which perform well under controlled moisture stress. This alignment between crop choice and natural resource endowment stabilises yields. In addition, Gujarat has one of the highest Seed Replacement Rates (SRR) in pulses, supported by a strong cooperative and private seed ecosystem.<sup>25</sup> This underscores the importance of using certified, high-performance varieties in place of farm-saved seeds to unlock higher yields, disease resistance, and productivity gains. In Telangana, the cultivated area, which stood at 1.31 crore acres in 2014, increased to 2.2 crore acres by FY 23 due to major flagship projects, such as the Kaleshwaram Lift Irrigation Project<sup>26</sup> and Mission Kakatiya<sup>27</sup> (tank rejuvenation), undertaken by Telangana. Therefore, access to irrigation facilities, aligning crops with natural resource endowments, and using climate-resilient high-yielding variety seeds, among other interventions, are imperative for improving yields.<sup>28</sup>

### Box VI.1: State level Innovations in Agricultural Governance leading to outcomes: Some evidence...

Several Indian states have undertaken targeted agricultural reforms in recent years, encompassing land governance, markets, water management, technology adoption, and crop diversification. These initiatives have improved farm outcomes. Certain key initiatives undertaken by various states and outcomes of the governance and scheme-based initiatives are as follows:

20 <https://www.niti.gov.in/sites/default/files/2025-09/Strategies-and-Pathways-for-Accelerating-Growth-in-Pulses-towards-the-Goal-of-Atmanirbharta.pdf>.

21 <https://www.niti.gov.in/sites/default/files/2025-09/Strategies-and-Pathways-for-Accelerating-Growth-in-Pulses-towards-the-Goal-of-Atmanirbharta.pdf>.

22 <https://www.niti.gov.in/sites/default/files/2025-09/Strategies-and-Pathways-for-Accelerating-Growth-in-Pulses-towards-the-Goal-of-Atmanirbharta.pdf>.

23 <https://www.niti.gov.in/sites/default/files/2025-09/Strategies-and-Pathways-for-Accelerating-Growth-in-Pulses-towards-the-Goal-of-Atmanirbharta.pdf>.

24 <https://www.niti.gov.in/sites/default/files/2025-09/Strategies-and-Pathways-for-Accelerating-Growth-in-Pulses-towards-the-Goal-of-Atmanirbharta.pdf>.

25 <https://rkvy.da.gov.in/Uploads/SucessStory/GUJARAT/2019/2019044022Success%20story%20GSSCL%20RKVY%20SRR%20-2018-19.pdf>.

26 <https://bhoopalapally.telangana.gov.in/tourist-place/kaleshwaram-lift-irrigation-project/>.

27 <https://missionkakatiya.cgg.gov.in/>.

28 Price Policy of Kharif Crops, for marketing season 2025-26, Commission for Agriculture Costs and Prices.

**Land and Resource Governance:** Andhra Pradesh implemented the Andhra Pradesh Resurvey Project (2021)<sup>29</sup> using drones, Continuously Operating Reference Station (CORS), and GIS to issue tamper-proof digital land titles. As of 2025, 6,901 villages have been covered, with 81 lakh land parcels resurveyed and approximately 86,000 boundary disputes resolved.<sup>30</sup> Bihar launched the Mukhyamantri Samekit Chaur Vikas Yojana (2025)<sup>31</sup> to develop chaur lands for aquaculture, bringing over 1,933 hectares under fish-based production across 22 districts.<sup>32</sup>

**Market Reforms:** Madhya Pradesh's Souda Patrak initiative<sup>33</sup> (2021) enabled direct MSP-based purchases from farmers through a digital platform, reducing mandi congestion and improving payment transparency. By December 2025<sup>34</sup>, over 1.03 lakh transactions had been facilitated. Andhra Pradesh's e-Farmarket platform<sup>35</sup> connected farmers and traders via Rythu Bharosa Kendras.

**Water Management:** Assam State Irrigation Plan (2022)<sup>36</sup> aimed to expand irrigation coverage through new schemes and solar pumps, increasing gross irrigated area to 24.28 per cent of agricultural land<sup>37</sup> by 2024–25. Uttar Pradesh Ground Water Rules (2020)<sup>38</sup> strengthened regulation of extraction, with groundwater recharge rising marginally by 2025, although extraction intensity also increased.

#### **Technology and Digital Agriculture:**

Karnataka's FRUITS platform<sup>39</sup> (2020) created a unified farmer database supporting DBT, MSP procurement, and crop surveys, covering over 55 lakh farmers and multiple schemes. Jharkhand launched a GIS-based Climate Smart Agriculture and Agri Stack Scheme<sup>40</sup> (2024) to enable farm-level tracking and climate-informed planning, with outcome indicators still in development. Fourth Agriculture Roadmap<sup>41</sup> of Bihar(2023–28) builds on earlier roadmaps, which have already led to significant increases in fish and milk production

29 [https://gad.ap.gov.in/2021gad\\_rt1183.pdf](https://gad.ap.gov.in/2021gad_rt1183.pdf).

30 <https://cdnbbsr.s3waas.gov.in/s3d69116f8b0140cdeb1f99a4d5096ffe4/uploads/2025/05/202505221774845111.pdf>.

31 <https://fisheries.bihar.gov.in/StateSchemes.aspx>.

32 Fisheries Department – Government of Bihar.

33 [aigppa.mp.gov.in/uploads/project/MPES\\_2022-23\\_English.pdf](http://aigppa.mp.gov.in/uploads/project/MPES_2022-23_English.pdf).

34 [https://eanugya.mp.gov.in/Public/Chart\\_Dashboard.aspx](https://eanugya.mp.gov.in/Public/Chart_Dashboard.aspx).

35 <http://www.efarmmarket.ap.gov.in>.

36 [https://irrigation.assam.gov.in/sites/default/files/public\\_utility/NEW%20SIP%20PDF%20FILE%20Final%20%5B13-12-2024%5D.pdf](https://irrigation.assam.gov.in/sites/default/files/public_utility/NEW%20SIP%20PDF%20FILE%20Final%20%5B13-12-2024%5D.pdf).

37 <https://northeasttoday.in/northeast/assam/assams-gross-agricultural-land-declines-slightly-irrigated-areas-increase-ashok-singhal/>.

38 <https://cdnbbsr.s3waas.gov.in/s3dcf6070a4ab7f3afb1d2809173e0824b/uploads/2024/10/202410291762596874.pdf>.

39 Ibid.

40 [https://avantiscdnprodstorage.blob.core.windows.net/legalupdatedocs/35218/Govt\\_of\\_Jharkhand\\_issued\\_the\\_Climate\\_Smart\\_Agriculture\\_Research\\_and\\_Agri\\_Stack\\_Scheme\\_SEP122024.pdf](https://avantiscdnprodstorage.blob.core.windows.net/legalupdatedocs/35218/Govt_of_Jharkhand_issued_the_Climate_Smart_Agriculture_Research_and_Agri_Stack_Scheme_SEP122024.pdf)

41 <https://onlinedbtgragiservice.bihar.gov.in/RoammissionissiondMap/krishirodamapmis/about.html>.

## **DRIVERS OF PRODUCTIVITY IMPROVEMENT: POLICY AND INSTITUTIONAL INTERVENTIONS.**

6.14 The growth in the agricultural sector can be achieved through either area expansion or increased productivity. Given that land and water resources are increasingly constrained, yield improvements have become central to enhancing output and farm incomes. In recent years, in line with the Doubling Farmers' Income (DFI) Report 2016, the government has been implementing a wide range of measures to raise productivity and enhance farmers' incomes. The DFI report had emphasised the need to improve crop and livestock yields, increase cropping intensity, and promote high-value agriculture. Reflecting these priorities, several interventions have been undertaken through inputs, technology, income support, market-related and insurance support. Many of these priorities are being implemented through a mission-mode approach, as discussed in the subsequent paragraphs.

6.15 The government has been implementing the National Food Security Mission (NFSM) since 2007 to enhance productivity and production of Rice, Wheat, Pulses, Coarse Cereals (maize and barley), Commercial Crops (Cotton, jute, and sugarcane), and Nutri-Cereals (Shree Anna), across the country through area expansion and productivity enhancement.<sup>42</sup> In FY25, the scheme was renamed the National Food Security and Nutrition Mission (NFSNM). Demonstration of crop protection technologies, access to high-yielding varieties, integrated nutrient and pest management techniques, efficient water-saving devices, and capacity building for farmers are prominent elements of the mission. The National Mission on Edible Oils–Oilseeds (NMEO-OS) and the National Mission on Edible Oils–Oil Palm (NMEO-OP) are also being implemented to achieve self-sufficiency in oilseed production, aiming for nearly 70 million tonnes by 2030-31 through productivity enhancement, improved varieties, good agricultural practices, private sector participation, cluster-based interventions, and assured procurement.<sup>43</sup> Additionally, the schemes aim to reduce import dependence substantially. Together, NMEO-OS and NMEO-OP represent a coordinated policy effort to enhance domestic supply, stabilise farmer incomes, and advance the goal of Atmanirbhar Bharat in edible oils. To reduce import dependency on pulses by increasing productivity, the scheme 'Mission for Atmanirbharta in pulses', aimed at achieving self-sufficiency in pulses, was approved on October 1 2025.

6.16 These combined interventions have led to a significant expansion in oilseed and palm oil cultivation and production. Between 2014–15 and 2024–25, the area under oilseeds increased by over 18 per cent, production by nearly 55 per cent, and productivity by about 31 per cent.<sup>44</sup> Oil palm area more than doubled over the same

<sup>42</sup> Department of Agriculture and Farmers Welfare.

<sup>43</sup> Ibid.

<sup>44</sup> Ibid.

period, accompanied by sharp increases in Fresh Fruit Bunch and crude palm oil production. As a result, domestic edible oil availability has risen from 86.30 lakh tonnes in 2015-16 to 121.75 lakh tonnes in 2023-24.<sup>45</sup> This has lowered the share of imported edible oil, reducing it from 63.2 per cent in 2015-16 to 56.25 per cent in 2023-24<sup>46</sup>, despite increasing domestic demand and consumption.

### Box VI.2: Ethanol Pricing and Cropping Incentives: Emerging Trade-offs for Food Security

India's ethanol-blended fuels have become an important pillar of the nation's energy security strategy in recent years. The programme has delivered tangible gains in crude oil substitution, reduced foreign exchange outflows, reduced emissions, and increased payments to farmers. As of August 2025, ethanol blending has saved India more than ₹1.44 lakh crore in foreign exchange and facilitated the substitution of about 245 lakh metric tonnes of crude oil.<sup>47</sup> As blending targets rise towards E20, the programme has necessarily expanded beyond traditional sugar-based feedstock to include food grains, particularly maize. While this diversification has enabled rapid scaling, recent evidence suggests that administered ethanol pricing, interacting with underlying technological changes in maize cultivation, is increasingly reshaping agricultural incentives, with implications for crop diversity and food security.

Maize's recent expansion in India reflects both structural productivity and evolving market signals. Data show that the national maize yield increased from approximately 2.56 tonnes per hectare in FY16 to roughly 3.78 tonnes per hectare by FY25.<sup>48</sup> Over the same period, yields for crops such as soybeans, sunflower seeds, rapeseed, peanuts, and millet, among others, have either stagnated or declined. This trend is consistent with broader projections by the OECD-FAO<sup>49</sup>, which attributes global cereal yield growth largely to technological improvements such as improved seed varieties and optimised agronomic practices. These productivity gains make maize a naturally attractive crop for farmers relative to many other cereals and pulses, even in the absence of policy intervention.

However, recent patterns indicate that ethanol pricing has begun to reinforce and accelerate this shift. The government annually fixes administered per-litre ethanol prices differentiated by feedstock, with assured offtake by Oil Marketing Companies. This is intended to provide farmers with a steady source of income that fairly accounts for their efforts. A feature of the pricing structure is that the administered price of ethanol is differentiated by feedstock, with a higher price for maize-based ethanol, a lower price for rice-based ethanol, and a price for molasses-based ethanol between the two. Between FY22 and FY25, the administered price of maize-based ethanol increased at a CAGR of 11.7 per cent, growing materially faster than ethanol derived from rice or molasses. This has created a strong and persistent price signal

45 Department of Agriculture and Farmers Welfare.

46 Ibid.

47 Press Information Bureau.

48 <https://tinyurl.com/38bk3cfy>.

49 OECD/FAO (2025), OECD-FAO Agricultural Outlook 2025-2034, OECD Publishing, Paris/FAO, Rome, <https://doi.org/10.1787/601276cd-en>.

in favour of maize. It was hoped that this would help shift acreage from paddy to maize, with the former witnessing excess stocks and the latter being less water-intensive.

Agricultural outcomes over the same period reflect a rational response to these incentives. Maize has recorded rapid growth in both production and cultivated area between FY22 and FY25, growing at a CAGR of 8.77 per cent and 6.68 per cent, respectively. During the same period, pulses have experienced a decline in output and acreage, while both oilseeds and cereals, excluding maize, have shown modest growth. The area cultivated for oilseeds grew at a CAGR of 1.7 per cent over the last four fiscal years, and cereals excluding maize recorded a CAGR of 2.9 per cent over the same time. Shifts in cultivation patterns are particularly visible in states such as Maharashtra and Karnataka<sup>50,51</sup>, where maize increasingly competes directly with pulses, oilseeds, soyabean, millets, and cotton for land, water, and labour. The expected reduction in paddy acreage has not materialised.

From a food security perspective, the implications are non-trivial. Pulses and oilseeds are structurally important to India's consumption basket and nutritional outcomes, yet they are shifting lower down the priority order for the nation's cultivators. Over time, this imbalance risks entrenching India's dependence on edible oil imports and exposing domestic food prices to greater volatility during supply shocks. This highlights an emerging tension between Aatmanirbharta in energy and Aatmanirbharta in food.

International experience underscores the importance of caution. OECD-FAO analyses of biofuel programmes in major economies show that biofuel mandates and feedstock-specific price incentives can lead to long-term alterations to cropping patterns and food price dynamics when not periodically recalibrated.<sup>52</sup> Countries with mature biofuel regimes have increasingly relied on adjustment mechanisms, feedstock caps, or a shift towards second-generation biofuels to mitigate competition with food crops. The Indian experience now displays similar early warning signals.

The policy challenge, therefore, is the concentration and durability of incentives that may unintentionally favour one set of crops over others. As the ethanol programme matures, there is a strong case for developing a comprehensive roadmap that takes a holistic view of energy security and food security. Key elements of such a roadmap could include accelerating yield improvements in pulses and oilseeds to restore their relative profitability, avoiding distortions in input and output markets that confer an undue advantage to specific feedstocks, and enabling targeted, planned growth of ethanol feedstocks aligned with regional resource endowments. Such an approach would preserve the economic logic of ethanol expansion while ensuring that energy security objectives are pursued without unintentionally weakening food security or nutritional outcomes.

6.17 Productivity gains in horticulture have been driven by various interventions, including the Mission for Integrated Development of Horticulture (MIDH), the Horticulture Cluster Development Programme, and the Clean Plant Programme, among

<sup>50</sup> <https://www.downtoearth.org.in/agriculture/lost-in-maize>.

<sup>51</sup> <https://tinyurl.com/bdd8r7a6>.

<sup>52</sup> Rieländer, J., Chalmers, K., Schopohl, K., & Halland, H. (2025). Biofuels and trade policies to mitigate food price shocks. OECD Development Centre Working Papers.

others. MIDH has played a significant role in expanding horticultural cultivation, bringing an additional 15.66 lakh hectares under horticulture crops as of July 2025.<sup>53</sup> The scheme has emphasised critical interventions such as the supply of quality planting material and the promotion of micro-irrigation. These measures have contributed to productivity gains, with average horticulture productivity increasing from 12.10 metric tonnes per hectare in 2019–20 to 12.56 metric tonnes per hectare in 2024–25.<sup>54</sup> This shift towards horticulture is further reinforced by region-specific success stories across states, ranging from banana cultivation in Maharashtra and Tamil Nadu to horticultural diversification in the North-Eastern and hill states, highlighting the sector's role in promoting income diversification, nutritional security and more resilient agricultural growth.

6.18 Agricultural productivity is the most vital differentiator in a country with limited capacity to enhance its agricultural land, given the competing needs of the economy and a fairly low per capita availability of farmland. Productivity enhancements are a factor of in situ and post-harvest interventions. In addition to the mission mode approach discussed earlier, specific interventions for each element that improve productivity are further deliberated.

## **Improving productivity in the Agriculture and allied sectors: The Role of Critical Inputs and Technology.**

### **Quality Seeds**

6.19 Several initiatives have been undertaken to enhance productivity through input and technology support. A key factor limiting crop productivity is the limited availability of quality seeds. The Sub-Mission on Seeds and Planting Materials (SMSP), launched in 2014–15, aims to ensure farmers have access to high-quality seeds by promoting seed production, processing, storage, and certification nationwide. Under this initiative, 6.85 lakh Seed Villages were created, 1649.26 lakh quintals of quality seeds were produced, and 2.85 crore farmers benefited.<sup>55</sup> A National Mission on High-Yielding Seeds has been announced in the Union Budget 2025-26, aimed at strengthening the research ecosystem, targeting the development and propagation of climate-resilient high-yielding varieties, and improving the commercial availability of more than 100 new seed varieties.<sup>56</sup>

6.20 While government initiatives have made notable progress in improving seed availability and varietal replacement rates, progress remains uneven across States and crops. In addition, many farmers continue to rely on older popular varieties or farm-

53 <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/aug/doc2025831625101.pdf>.

54 Ibid

55 <https://pib.gov.in/PressNoteDetails.aspx?NoteId=154580&ModuleId=3&reg=3&lang=2>.

56 Price Policy of Kharif Crops, for marketing season 2025-26, Commission for Agriculture Costs and Prices.

saved seeds due to high costs or limited access to certified seeds. Greater efforts are needed to accelerate the integration of newer varieties and to encourage farmers to adopt quality seeds through field demonstrations and the dissemination of successful farmer experiences. A way forward towards better implementation could be through the involvement of strengthened extension services and by integrating Farmer-Producer Organisations (FPOs), Primary Agriculture Cooperative Societies (PACS) and Self Help Groups (SHGs) into the implementation framework.

### Box VI.3: Prime Minister Dhan Dhaanya Krishi Yojana: Envisioning Prosperity

The Government of India, in its Union Budget for 2025, announced the development of 100 Aspirational Agricultural Districts under “PM Dhan Dhaanya Krishi Yojana (PM-DDKY).<sup>57</sup> PMMDKY was approved in July 2025 for six-years commencing with FY26, to cover 100 aspirational districts. The Scheme aims to (1) enhance agricultural productivity, (2) increase adoption of crop diversification and sustainable agricultural practices, (3) augment post-harvest storage at the panchayat and block levels, (4) improve irrigation facilities, and (5) facilitate availability of long-term and short-term credit. The districts have been identified based on three key indicators: low productivity, low cropping intensity, and limited credit disbursement.

The Scheme will be implemented through the convergence of 36 existing schemes across 11 Departments, other State schemes and local partnerships with the private sector. Central Agricultural University (CAU)/State Agricultural Universities (SAUs) have been assigned as the technical knowledge partner for all aspects of agriculture in each district. The goal is for these 100 districts to surpass the national and state averages in key performance indicators, thereby improving national indicators and increasing farmers' incomes.

## Irrigation and Water-Use Efficiency

6.21 Access to assured water through irrigation is a key driver of agricultural productivity. Effective irrigation systems provide farmers with the certainty of water when needed, improve nutrient uptake, make agriculture more resilient to the vagaries of nature, facilitate crop diversification, and enable multiple cropping. The main goal<sup>58</sup> of PMKSY is to achieve coordinated investments in irrigation at the farm level, increase the area suitable for assured irrigation, enhance efficiency in on-farm water usage to minimize water waste, promote the use of precision irrigation and other water-saving techniques, boost the replenishment of aquifers, and implement sustainable water conservation methods by examining the viability of reusing treated municipal wastewater for peri-urban agriculture, all while attracting more private investment in precision irrigation systems. In addition, the government promotes micro-irrigation by providing 55 per cent financial assistance to small and marginal farmers and 45 per cent to other farmers for the installation of Drip and Sprinkler systems under the

<sup>57</sup> Department of Agriculture and Farmers Welfare.

<sup>58</sup> Department of Agriculture and Farmers Welfare.

PDMC<sup>59</sup> program. As a result, the gross irrigated area as a share of the gross cropped area has increased from 41.7 per cent in 2001-02 to 55.8 per cent in 2022-23. However, significant inter-State and inter-crop disparities persist, with irrigation coverage ranging from less than 15 per cent in millets and around 26 per cent in pulses to about 67 per cent in rice.<sup>60</sup> Expanding irrigation in lagging States and crops, while ensuring sustainability, is an urgent and important priority. The return on investment for the economy in rejuvenating water bodies and increasing surface water storage will be much greater than the returns from other public investments.<sup>61</sup>

## Soil Health and Balanced Nutrient Management

6.22 Declining soil health, particularly a decline in soil organic carbon, poses a major challenge to agricultural productivity in India. The Government has taken steps to address this through the Soil Health Management (SHM) and Soil Health Card (SHC) schemes<sup>62</sup> under the National Project on Management of Soil Health & Fertility, promoting integrated nutrient management by combining chemical fertilisers with organic manures and bio-fertilisers. Over 25.55 crore cards have been issued (as of 14 November 2025).<sup>63</sup> Complementing these efforts, the government also initiated the National Soil Mapping Programme (NSMP)<sup>64</sup> and the National One Soil Unified Information System (NOSUIS)<sup>65</sup> to generate detailed village-level soil resource inventories for sustainable agriculture and crop planning. The Soil and Land Use Survey of India (SLUSI)<sup>66</sup> has surveyed approximately 39 million hectares and produced digital soil maps for 18 million hectares, providing evidence-based support for soil and nutrient management. Despite the scale-up of soil testing infrastructure and Soil Health Cards, fertiliser use remains inefficient, with the N:P: K ratio deteriorating in recent years, largely due to price distortions favouring nitrogenous fertilisers, leading to a declining crop response. Addressing this requires renewed efforts to promote balanced nutrient application based on soil diagnostics and analysis.

### Box VI.4: Re-orienting Fertiliser Use Towards Soil Health and Crop Productivity

For more than three decades, Indian agriculture has been grappling with a steadily worsening imbalance in the use of plant nutrients. While high-yielding varieties and assured irrigation initially made heavy nitrogen application profitable, continued divergence between nitrogen and other nutrients has now begun to undermine soil quality, crop response and

59 Ibid.

60 Ibid.

61 Chand, R., & Singh, J. (2023). From Green revolution to Amrit Kaal. National Institution for Transforming India. GoI.

62 Department of Agriculture and Farmers Welfare.

63 Department of Agriculture and Farmers Welfare.

64 Department of Agriculture and Farmers Welfare.

65 <https://soilhealth.dac.gov.in/>

66 Department of Agriculture and Farmers Welfare.

environmental stability. Successive Economic Surveys have highlighted this problem, as the ratio of nitrogen (N), phosphorus (P) and potassium (K) used by Indian farmers has drifted far from agronomic norms.

In 2009–10, the N:P:K ratio stood at 4:3.2:1<sup>67</sup>, close to recommended levels for most Indian soils. By 2019–20 it had deteriorated to 7:2.8:1, and by 2023–24 had worsened further to about 10.9:4.1:1.<sup>68</sup> Agronomic benchmarks for most crops and soil types suggest a ratio closer to 4:2:1.<sup>69</sup> The divergence has been driven overwhelmingly by excessive nitrogen application, primarily through urea, which has become the dominant nutrient source across much of the country.

The consequences are now well documented. Excess nitrogen reduces soil organic matter, accelerates micronutrient depletion, weakens soil structure and increases nitrate leaching into groundwater. Over time, crops require progressively larger quantities of fertiliser to maintain yields, raising input intensity without commensurate output gains. In several irrigated belts, the yield response to fertiliser has plateaued or declined, even as application rates have increased. This pattern reflects not the under-use of inputs but their misallocation across nutrients.

India has already undertaken important steps to improve fertiliser management. Nutrient-based pricing, neem-coating of urea, Aadhaar-linked point-of-sale verification<sup>70</sup>, and the Integrated Fertiliser Management System have improved transparency<sup>71</sup>, logistics and control over physical flows. Yet these measures operate largely on the supply and distribution side. They do not alter the core economic signal that farmers face when choosing nutrients. As long as one nutrient is vastly cheaper than others, its overuse is structurally embedded, regardless of monitoring or enforcement.

A more durable correction, therefore, requires re-anchoring fertiliser decisions in soil and crop requirements rather than in administered price distortions. This can be achieved by separating farmer income support from fertiliser purchase and allowing nutrient prices to convey agronomic scarcity.

### **From Input Distortion to Acre-Based Support**

A practical approach is to modestly increase the retail price of urea while transferring an equivalent amount directly to cultivators on a per-acre basis. Farmers receive the same overall purchasing power, but the relative price of nitrogen moves closer to its agronomic cost.

This changes behaviour in a predictable way. Farmers who already apply nitrogen efficiently gain because they receive the full transfer while spending less at the counter. Farmers who over-apply face a clear incentive to shift towards balanced fertilisation, soil testing, nano-urea, liquid fertilisers and organic amendments. Low-input farmers, particularly those growing pulses and oilseeds in rain-fed regions, experience a net income gain. The adjustment is therefore both progressive and efficiency-enhancing.

67 Economic Survey 2023-24

68 Ibid.

69 Economic Survey 2015-16

70 <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=2183291&reg=3&lang=2>.

71 Rajya Sabha Unstarred question number 982 answered on 1912. 2025.

Because fertiliser needs vary sharply by crop, soil and irrigation, the transfer must be indexed to agro-climatic zones and cropping patterns. Rice–wheat belts, sugarcane tracts and other high-yield systems legitimately use more nitrogen than rain-fed coarse cereals or pulses. Zone- and crop-specific benchmarks ensure that structural differences in agronomic demand are recognised while still rewarding efficiency within each category.

### **Soil, Water and Yield Effects**

The primary benefit of this transition is agronomic. When nitrogen is no longer artificially cheap, farmers begin to substitute towards phosphorus, potassium and organic matter, restoring nutrient balance. Soil carbon levels improve, microbial activity increases, and root systems develop more effectively. Water retention and heat-stress resilience improve, which is increasingly important under climate variability.

Corrected nutrient ratios also raise yield response. Balanced fertilisation improves nutrient uptake efficiency, meaning that each kilogram of applied fertiliser produces more output. Over time, this reduces the total quantity of fertiliser required per tonne of grain, lowering pressure on soils and water bodies while sustaining or increasing production.

Domestic experience with neem-coated urea, which reduced diversion and misuse, already shows that small changes in input design can generate large efficiency gains. Extending this logic to price signals completes the transition from administrative control to biological optimisation.

### **System Readiness**

India's digital agriculture infrastructure makes such a reform operationally feasible. Aadhaar-linked fertiliser sales at the point of purchase, combined with real-time tracking through iFMS, provide a detailed map of nutrient use across districts and seasons. PM-Kisan offers a ready platform for calibrated, timely per-acre transfers. Aligning transfers with planting seasons ensures that liquidity reaches farmers before fertiliser is purchased.

One design issue concerns tenancy: as a portion of the land is cultivated by renters while transfers may accrue to owners. Over time, this is expected to adjust through the rental market, but pilot designs can incorporate tenancy-heavy districts to refine mechanisms before a wider rollout.

### **A Phased Agronomic Transition**

Rolling out this approach across a limited number of agro-climatic regions—covering irrigated, rain-fed and mixed systems—would allow for careful calibration of crop- and zone-specific benchmarks. Data from these pilots would inform refinements to transfer levels, soil response and nutrient shifts before national expansion.

The objective is not to compress fertiliser use but to re-align it with crop physiology and soil biology. By restoring balanced nutrition, India can move from volume-driven input use to efficiency-driven crop growth.

In this way, re-engineering fertiliser support becomes a tool for protecting soils, raising yield response and stabilising farm incomes over the long run. It enables farmers to become stewards of land productivity rather than passive recipients of distorted input incentives placing Indian agriculture on a more resilient and sustainable trajectory.

## Credit

6.23 Access to institutional credit boosts agricultural productivity by enabling investment in quality inputs, mechanisation, irrigation, improved technologies, and climate-resilient practices, particularly for small and marginal farmers. Agricultural credit flows from both formal sources, such as commercial banks, Regional rural banks (RRBs), cooperatives, small finance banks, and Microfinance Institutions (MFIs), and informal sources, including moneylenders, traders, and personal networks. Key frameworks, such as the Lead Bank Scheme<sup>72</sup> and Priority Sector Lending<sup>73</sup>, aim to ensure timely and targeted credit delivery to priority farm households and the rural economy.

6.24 Ground Level Credit (GLC) disbursement stood at ₹28.69 lakh crore, which includes ₹15.93 lakh crore under short term loans and ₹12.77 lakh crore under term loans, surpassing the ₹27.5 lakh crore target in FY 25.<sup>74</sup> The KCC scheme, which had 7.72 crore operative accounts with outstanding balances of ₹10.20 lakh crore as of 31st March 2025, was further strengthened by the Modified Interest Subvention Scheme (MISS), which offered loans at a subsidised interest rate of 7 per cent with a 3 per cent prompt repayment incentive. Between FY15 and FY26, a total of ₹ 1.77 lakh crore was disbursed as a subsidy under MISS.<sup>75</sup> To streamline claim processing, the Kisan Rin Portal (KRP)<sup>76</sup> was launched in 2023 and integrates 30 Scheduled Commercial Banks, 42 Regional Rural Banks, 20 State Cooperative Banks, and 356 District Central Cooperative Banks, covering over 5 crore farmers. The portal enhances credit system efficiency by identifying multiple loan accounts under a single farmer, preventing misuse and ensuring subsidies are granted for productive loans. It has flagged ₹1,080.88 crores in duplicate or excess claims out of a total of ₹37,506.53 crores, thereby strengthening financial discipline in agricultural credit. In addition, sustained policy measures over the years have reduced the share of non-institutional credit from 90 per cent in 1950 to 23.4 per cent in 2021-22.<sup>77</sup>

<sup>72</sup> Department of Agriculture and Farmers Welfare.

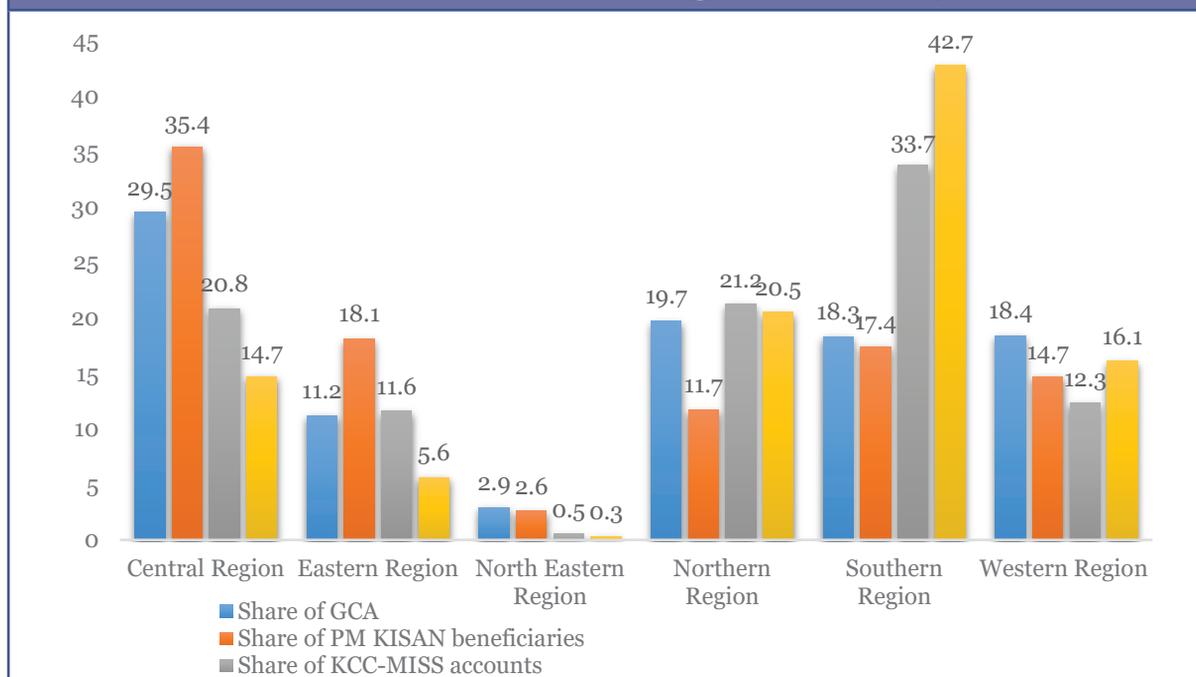
<sup>73</sup> Ibid.

<sup>74</sup> Ibid.

<sup>75</sup> Ibid.

<sup>76</sup> <https://fasalrin.gov.in/>

<sup>77</sup> Ibid.

**Chart VI.9: Region-wise share in KCC-MISS accounts, Credit disbursed, and MISS benefit released through KRP for FY 25**

Source: Department of Agriculture & Farmers Welfare

(Note: Share of KCC-MISS accounts, MISS benefits and Average loan size are as per the data submitted by banks on KRP as on 07.10.2025)

6.25 However, the regional trends highlight notable disparities in the alignment between the scale of agricultural activity, beneficiary outreach and the flow of institutional credit. For instance, the Central region, despite accounting for 30 per cent Gross Cropped Area<sup>78</sup> and the highest share of PM KISAN beneficiaries, reflects only 14.7 per cent of MISS benefits released<sup>79</sup>, indicating significant untapped potential for credit linkage and KCC coverage. Regional disparities persist, with some States receiving disproportionately higher credit per hectare, highlighting the need for more equitable distribution.

### Mechanisation and Collective Access

6.26 The Government has made significant efforts to promote farm mechanisation through the Sub-Mission on Agricultural Mechanisation (SMAM)<sup>80</sup>, providing assistance to State Governments for training and demonstration of agricultural machinery, establishing Custom Hiring Centres (CHCs), and supporting farmers in procuring farm equipment. Between 2014-15 and 2025-26, a total of 25,689 CHCs have been established under the scheme, including 558 CHCs set up during 2025-

<sup>78</sup> <https://fasalrin.gov.in>

<sup>79</sup> <https://fasalrin.gov.in>

<sup>80</sup> Ibid.

26 (as of 30 October 2025).<sup>81</sup> However, fragmented landholdings and rising labour shortages continue to hinder the adoption of mechanisation, underscoring the need for appropriate, affordable machinery, supported by R&D, and for strengthening collective ownership models through FPOs, PACS, and SHGs to enhance access and utilisation of mechanisation at the farm level.<sup>82</sup>

## Technology and Input Support in Livestock, Fisheries and Aquaculture

6.27 Within the livestock sector, growth has been supported by measures that include indigenous technological capabilities to accelerate genetic improvement, reduce costs for farmers, and enhance herd quality. In addition, significant progress has been made in strengthening animal health systems. The nationwide Foot and Mouth Disease (FMD) control programme<sup>83</sup>, supported by central funding, large-scale vaccination, digital animal identification, and disease surveillance, represents a major step towards improving livestock productivity. About 125 crore FMD vaccinations have been administered since 2020. The Artificial Insemination (AI) programme has expanded, with annual inseminations rising from 76.23 million in 2017–18 to 88.32 million in 2024–25, enabling 126 districts to achieve 50 per cent AI coverage and increasing AI coverage of breedable bovine females from 25 per cent to 40 per cent.

6.28 Despite recent gains, sustaining dairy sector growth remains challenging. Feed and fodder shortages, which account for a significant share of milk production costs, are the most critical constraint, as livestock growth has outpaced fodder expansion, thereby increasing input costs. This is because the area under fodder crops is estimated at 9.13 million hectares, accounting for about 4.61 per cent of the gross cropped area.<sup>84</sup> Feed and fodder account for over 70 per cent<sup>85</sup> of the cost of milk production, and persistent shortages and quality constraints continue to affect livestock nutrition. ICAR-Indian Grassland and Fodder Research Institute, Jhansi (IGFRI), estimates indicate demand-supply gaps of 11–32 per cent in green fodder, 23 per cent in dry fodder, and 28–40 per cent in concentrates, underscoring the need for targeted interventions to ensure feed and fodder security.

6.29 Financial and technological interventions in the fisheries sector are being implemented under Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana (PM-MKSSY)<sup>86</sup> introduced in February 2024. Further, the government has designated specific Nucleus

<sup>81</sup> Ibid.

<sup>82</sup> Chand, R., & Singh, J. (2023). From Green revolution to Amrit Kaal. National Institution for Transforming India. GoI.

<sup>83</sup> Department of Animal Husbandry and Dairying.

<sup>84</sup> Land Use Statistics at a Glance, 2024.

<sup>85</sup> Department of Animal Husbandry and Dairying

<sup>86</sup> Department of Fisheries.

Breeding Centres (NBCs)<sup>87</sup> to enhance the genetic quality of aquaculture species, aiming to improve productivity and quality of species such as shrimp, which are vital for both domestic consumption and export.

### **Infrastructure and Marketing support**

6.30 Recognising the need to crowd in private investment for agricultural marketing, the Government has implemented the Agriculture Marketing Infrastructure (AMI)<sup>88</sup> sub-scheme under the Integrated Scheme for Agricultural Marketing (ISAM) since 2014. The scheme, designed as a capital investment, demand-driven, credit-linked, back-ended subsidy programme, provides financial support to individuals, farmers, FPOs, cooperatives, agri-preneurs, and state agencies for creating storage and other marketing infrastructure. As of 31 December 2025, 49,796 storage projects have been sanctioned with ₹4,832.70 crore released, while 25,009 other marketing infrastructure projects received ₹2,193.16 crore in subsidy. To further strengthen farm-gate infrastructure and engage private players, the Agriculture Infrastructure Fund (AIF) was launched with a financing facility of ₹1 lakh crore (FY 21 to FY 26, support extending to FY33), offering medium-term debt for post-harvest management and community farming projects with interest subvention and credit guarantees. As of 27 November 2025 AIF has mobilised ₹1,23,002 crore, supporting over 39,000 customer hiring centres, over 25,000 processing units, over 17,000 warehouses, over 4000 sorting and grading units, and over 2700 cold storage projects among others.<sup>89</sup>

6.31 To improve price discovery and competitive access to buyers, the Government launched e-NAM in April 2016 as a pan-India virtual market platform. Under the scheme, each Agriculture Price Marketing Committee (APMC) mandi receives ₹75 lakh for hardware and software support, quality assaying, and related infrastructure. By 31 December 2025, e-NAM registered around 1.79 crore farmers, 2.72 lakh crore traders, and 4,698 FPOs, covering 1,522 mandis across 23 states and 4 UTs. To strengthen collective marketing, the Government launched a new FPO scheme in 2020 with a budget of ₹6,860 crore through 2027-28, aiming to form 10,000 FPOs. By 31 December 2025, 10,000 FPOs were registered. In addition, the Government has approved the Digital Agriculture Mission in September 2024, which envisages the creation of a Digital Public Infrastructure (DPI) for agriculture, including AgriStack, the Krishi Decision Support System, a comprehensive soil fertility and profile map, and other IT initiatives of the Central and State Governments to enable a robust digital agriculture ecosystem. This is expected to catalyse reliable, farmer-centric digital innovations and ensure timely access to crop-related information for farmers.<sup>90</sup>

<sup>87</sup> Ibid.

<sup>88</sup> Department of Agriculture and Farmers Welfare.

<sup>89</sup> Department of Agriculture and Farmers Welfare.

<sup>90</sup> Rajya Sabha Unstarred Question no 672 answered on 05.12.2025

6.32 In the livestock sector, the Animal Husbandry Infrastructure Development Fund (AHIDF)<sup>91</sup> has been established to enhance value addition, minimise post-production losses, and strengthen market linkages. This initiative has spurred investments in dairy processing, animal feed manufacturing, breed improvement, and related activities, especially in relatively underserved regions.

6.33 Turning to the fisheries sector, India has consolidated its status as a major global seafood supplier, exporting to over 130 countries. This achievement reflects increased productivity, diversification, and the adoption of modern practices. Government initiatives have played a vital role in driving this growth. Key programs, such as the Pradhan Mantri Matsya Sampada Yojana (PMMSY)<sup>92</sup>, the Fisheries Infrastructure Development Fund (FIDF)<sup>93</sup>, and PM Matsya Kisan Samridhi Sah Yojana (PM-MKSSY), have significantly bolstered infrastructure, improved market access, and strengthened institutional capacity. Investments have been funnelled into fishing harbours, fish landing centres, cold chain systems, processing facilities, deep-sea fishing, and advanced aquaculture systems. It can be seen that PM-MKSSY has advanced the formalisation of the fisheries sector through performance-linked incentives, supported by the National Fisheries Digital Platform, which has onboarded over 28 lakh stakeholders to enable digital identity, credit access, insurance and value-chain integration. In addition, collectivisation efforts continue through the formation of 2,195 Farmers Fisheries Producers Organisations (FFPOs) with an investment of ₹544 crore to enhance market linkages and financial inclusion.<sup>94</sup> Financial inclusion and welfare programmes have extended KCC benefits to 4.39 lakh fishers, providing insurance coverage to 3.3 million beneficiaries, and delivering livelihood support to an average of 7.44 lakh fisher families during lean periods.<sup>95</sup> In addition, the ISRO-enabled Vessel Communication and Support System (VCS) was launched in 2024, covering over 36,000 fishing vessels against a target of one lakh, improving safety and access to advisories.<sup>96</sup>

6.34 Despite these gains, several challenges remain. Value addition and processing capacity need to expand faster to reduce dependence on a narrow export basket. Infrastructure gaps persist in post-harvest handling, cold chains, and logistics, particularly in inland and remote regions. Strengthening aquatic animal health, biosecurity, and quality standards will be critical as production intensifies.

### Extension services support

6.35 Agricultural extension plays a vital role in transferring scientific knowledge,

<sup>91</sup> Department of Animal Husbandry and Dairying.

<sup>92</sup> Department of Fisheries.

<sup>93</sup> Department of Fisheries.

<sup>94</sup> Department of Fisheries.

<sup>95</sup> Ibid.

<sup>96</sup> Ibid.

improved technologies, and sustainable agriculture practices to farmers, thereby enhancing productivity and resilience. In India, extension services—delivered through public agencies, Krishi Vigyan Kendras, agricultural universities, private firms, and digital platforms—have historically supported major gains but continue to face challenges of limited reach, staff shortages, and fragmented delivery. The Government is implementing the Sub-Mission on Agricultural Extension (SMAE) under the Krishonnati Yojana to strengthen agricultural extension services. Through Support to State Extension Programmes Agricultural Technology Management Agency (ATMA)<sup>97</sup>, the government provides farmers access to the latest technologies through training, demonstrations, exposure visits, farm schools, and Kisan Melas. In 2024-25, 39.04 lakh farmers benefited, and in 2025-26 (till October) 20.08 lakh farmers have been supported.

6.36 In addition, the Diploma in Agricultural Extension Services for Input Dealers (DAESI) programme trains input dealers over a 48-week course to link their businesses with extension services, reaching 12,920 dealers in 2024-25 and 107,659 as of October 2025. Recent reforms focus on strengthening digital advisories, improving coordination across institutions, and promoting farmer-led organisations such as FPOs. These efforts aim to modernise extension, enhance responsiveness, and better integrate farmers into evolving value chains. Kisan Call Centres address farmers' queries in 22 languages. 30.65 lakh calls were answered in 2024-25, and 18.91 lakh till October 2025.

## PRICE AND INCOME SUPPORT

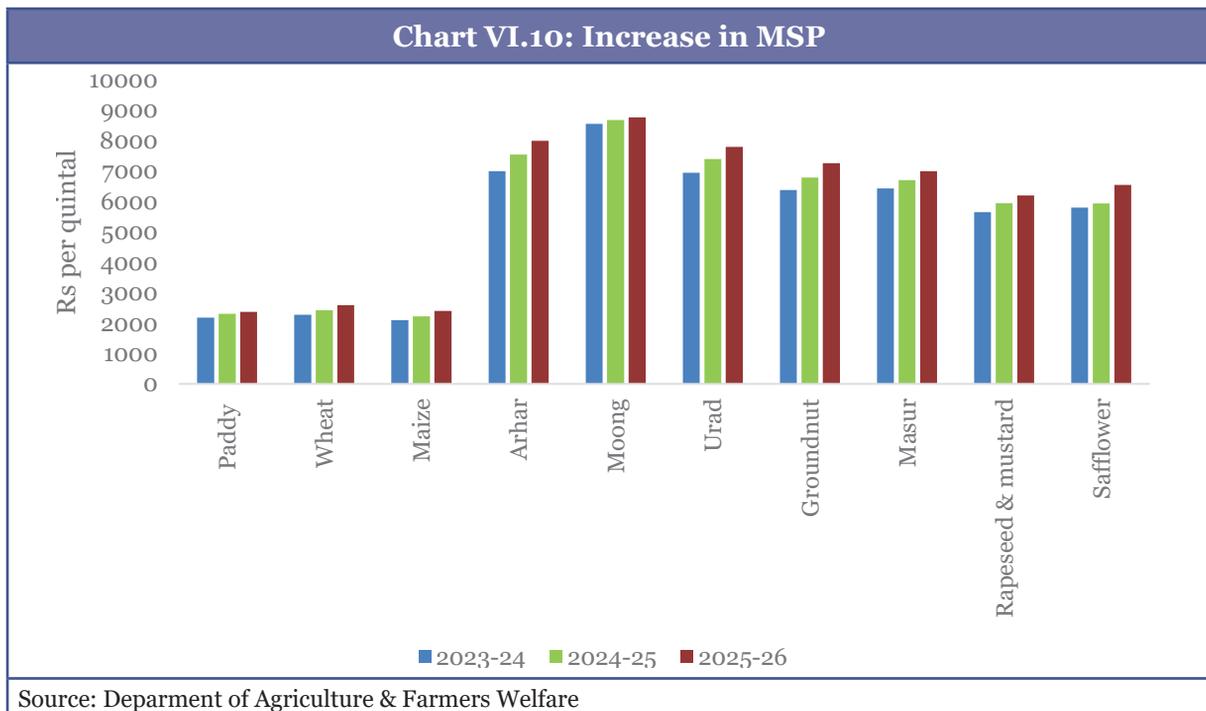
6.37 Price and Income support policies are essential because farm incomes remain unstable due to weather shocks, market volatility, and rising input costs. Small and marginal farmers have limited resilience and weak bargaining power. Assured income and fair prices provide basic stability, encourage productive investment, and help sustain viable agricultural livelihoods. To ensure remunerative prices for farmers, the government announces Minimum Support Prices (MSP) for 22 mandated crops.<sup>98</sup> The Union Budget for 2018-19 announced the predetermined principle of keeping the MSP at 1.5 times the cost of production. Accordingly, the Government has increased the MSPs for all mandated Kharif, Rabi and other commercial crops with a return of at least 50 per cent over the all-India weighted average cost of production. The government has announced the increase in MSP for all mandated Kharif and Rabi crops for the Kharif Marketing Season (KMS) 2025-26 and for the Rabi Marketing Season (RMS) 2026-27, respectively.

6.38 Furthermore, income support through assured prices and schemes, such as

<sup>97</sup> Department of Agriculture and Farmers Welfare.

<sup>98</sup> 14 Kharif crops (Paddy, jowar bajra, ragi, maize arhar, moong, urad, cotton, groundnut, sunflower seed, soyabean yellow, sesamum, nigerseed) and 6 Rabi Crops (wheat, barley, gram, masur, rapeseed & mustard, safflower) and two commercial crops (jute and copra).

the Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), has further contributed to strengthening farm incomes, sustaining investments and growth in the agricultural sector. Since its inception, under PM-KISAN, more than ₹4.09 lakh crore has been released to eligible farmers in 21 instalments.<sup>99</sup> To enhance social security for vulnerable farmers, the Government implements the Pradhan Mantri Kisan Maandhan Yojana (PMKMY), which has 24.92 lakh farmers enrolled as of 31 December 2025.<sup>100</sup>



### Box VI.5: Using Procurement Efficiencies to Support Crop Diversification and Farmer Incomes

India's public foodgrain procurement system has been a cornerstone of national food security and farmer welfare for more than five decades. It has ensured price stability, protected producers from market volatility, and maintained adequate stocks for the Public Distribution System (PDS). In recent years, however, the scale of procurement particularly in rice and wheat—has grown faster than underlying food security requirements, leading to persistently high buffer stocks and rising carrying costs. Expenditure on storage, handling, interest and stock rotation now absorbs a large volume of public resources that could potentially be used more productively within agriculture itself.

At the same time, India remains structurally dependent on imports of edible oils, pulses and some feedstocks. This creates an opportunity to better align farm support with changing consumption patterns, environmental sustainability and national self-reliance, while fully preserving the food security architecture.

<sup>99</sup> Department of Agriculture and Farmers Welfare.

<sup>100</sup> Ibid.

### **A calibrated diversification approach**

Rather than altering MSP or weakening procurement, a calibrated strategy may use savings from improved stock management to support voluntary crop diversification. Farmers can be offered financially attractive alternatives to a part of their rice and wheat acreage, particularly in regions where procurement volumes are high but farm profitability remains modest and agro-ecological conditions favour other crops.

The initial phase of such an approach can focus on the eastern and central regions of the country, where rainfall patterns, soil conditions, and market access make crops such as pulses, oilseeds, and maize economically and agronomically viable. Regions that are strategically critical for national food security can be incorporated in later phases, once the approach has been tested and refined.

### **Linking agronomy, markets and national priorities**

Crop choices under diversification would be guided by agro-climatic suitability and emerging market demand. In large parts of eastern India, maize, pulses, and oilseeds naturally fit into existing cropping systems. In central regions, oilseeds, such as gram and soybeans, are well suited to prevailing rainfall and soil conditions. These crops directly support national priorities: edible oils and pulses reduce import dependence, while maize and oilseeds contribute to the expansion of ethanol, livestock, and bioenergy value chains.

By encouraging such shifts on a voluntary and incentivised basis, the agricultural system can remain fully food-secure while becoming more diversified, resource-efficient and market-oriented.

### **Ensuring farmer income protection**

To ensure that diversification does not expose farmers to income risk, per-quintal or per-acre incentives can be used to offset yield differences and transitional costs. Experience from several states shows that relatively modest bonuses can make alternative crops financially more attractive than continued monocropping of rice or wheat, particularly when combined with lower input costs for water, fertiliser and energy.

These incentives can be financed from the fiscal savings created by reducing the accumulation of excess stocks and associated carrying costs, making the overall approach fiscally neutral while remaining farmer-centric.

### **Centre–State partnership**

State-level diversification missions would be implemented through a structured partnership between the Centre and the States. The Centre's contribution would come from procurement, storage, and interest savings, while the States would fund their share from complementary gains, such as reduced input subsidies and existing incentive frameworks for sustainable agriculture. Where needed, transitional financing could be provided, conditional on verified acreage shifts and subsidy savings.

### From procurement to market development

Over time, public intervention can gradually evolve from physical procurement towards enabling markets for a wider range of crops. Instead of accumulating new surpluses, the government can increasingly rely on price-deficiency payments, bonuses and assured offtake mechanisms to stabilise farmer incomes while encouraging private investment in processing, storage and logistics.

A portion of the fiscal savings should be reinvested in post-harvest and value-chain infrastructure—such as oilseed processing, pulse milling, maize drying and ethanol linkages—leveraging public–private partnerships and the Agri-Infrastructure Fund. Research institutions and agricultural universities can support the transition by providing region-specific seed and agronomic packages as part of an integrated diversification framework.

### Safeguards and governance

Food security remains protected through automatic adjustments in procurement volumes and buffer norms. WTO compatibility can be maintained by structuring diversification support as area-based, decoupled payments linked to sustainability and diversification goals. Phased implementation ensures that price stability, stock adequacy and farmer welfare are continuously monitored before wider expansion.

### Conclusion

Utilising efficiencies in the existing procurement system to finance voluntary, agronomy-led diversification provides a practical pathway to increase farmer incomes, alleviate fiscal pressures, and enhance long-term food and nutritional security. The approach preserves the core strengths of India's foodgrain system while adapting it to a more diverse, resilient and market-oriented agricultural future.

## Crop Insurance Support

6.39 Agriculture is highly exposed<sup>101</sup> to weather-related and other production risks, making farm incomes uncertain. Insurance helps de-risk agriculture by providing financial protection against crop losses, stabilising farmer incomes, and enabling them to recover quickly and continue investing in productive activities.

6.40 The Pradhan Mantri Fasal Bima Yojana (PMFBY) provides farmers with essential protection against crop losses resulting from natural calamities, pests, diseases, and adverse weather conditions throughout the crop cycle. In 2024-25, the scheme insured 4.19 crore farmers, a 32 per cent increase over 2022-23, covering 6.2 crore hectares, up 20 per cent from the previous year. Since its inception in 2016-17, PMFBY has processed 86 crore applications and disbursed over ₹1.90 lakh crore in claims. The DigiClaim module ensures timely direct payments to farmers via the Public Financial Management System (PFMS), while the upgraded National Crop Insurance Portal

<sup>101</sup> Department of Agriculture and Farmers Welfare.

(NCIP) serves as a single source of verified information, promoting wider state adoption and increased farmer participation. By mitigating financial risks, the scheme enables farmers to invest confidently in modern inputs and technologies, thereby enhancing agricultural productivity.

6.41 In addition to the above-mentioned initiatives, the government is also implementing the Restructured Weather-Based Crop Insurance Scheme.<sup>102</sup> Operational improvements, including the adoption of the Yield Estimation System based on Technology (YES-TECH) for yield estimation, Weather Information Network and Data System (WINDS) for automatic weather stations, and automatic rain gauges, have enhanced transparency and objectivity. YES-TECH leverages remote sensing for yield estimation, currently implemented in nine major states, with Madhya Pradesh adopting a fully technology-based yield assessment.

## Cooperatives

6.42 Cooperatives have long played a pivotal role in Indian agriculture by facilitating collective action in credit, input supply, and marketing, particularly for small-scale farmers.<sup>103</sup> Their role is expanding with modern cooperatives and FPOs supporting aggregation, better price realisation, digital market access, and participation in processing, making them central to a more competitive and inclusive farm economy.

6.43 Recent initiatives aim to reposition cooperatives, particularly PACS<sup>104</sup> and cooperative banks, as decentralised, multipurpose institutions that support rural livelihoods, financial inclusion, and agricultural transformation. A key reform is the restructuring of PACS through model bye-laws that permit diversification into over 25 activities, including input supply, storage, processing, fuel retail, and delivery of public services. This shift aims to enhance their financial viability and integrate PACS into rural service ecosystems. Large-scale computerisation and integration with the cooperative banking network are intended to enhance transparency and efficiency. A total of 67,930 PACS are being computerised, with ₹752.77 crore given to States and ₹165.92 crore to NABARD.<sup>105</sup> So far, 54,150 PACS are on Enterprise Resource Planning (ERP) software, and 43,658 are live. The project for 18,000 PACS was inaugurated on 24 February 2024, boosting digital operations in cooperatives.

6.44 The plan to establish new multipurpose PACS, dairy, and fisheries cooperatives across all panchayats reflects an ambition to universalise cooperative presence. Reflecting this, by March 2025, 18,183 new multipurpose cooperative societies had

102 <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2089250&reg=3&lang=2>.

103 Ministry of Cooperation

104 Ministry of Cooperation

105 <https://www.pib.gov.in/PressNoteDetails.aspx?id=154829&NoteId=154829&ModuleId=3&reg=3&lang=2>.

been registered across the country.<sup>106</sup> Complementary initiatives, such as decentralised grain storage through scheme convergence, position PACS as critical nodes in post-harvest management. The decentralised grain storage program has set up godowns in 11 PACS, with foundation stones laid for 500 more on 24 February 2024.<sup>107</sup>

6.45 As an important initiative to strengthen the cooperative movement in India, Tribhuvan Sahkari University is being established.<sup>108</sup> While initiatives such as the creation of a national cooperative university, the inclusion of cooperatives in school curricula, and the introduction of a National Cooperation Policy highlight efforts to revitalise the cooperative sector, the effectiveness of these measures will depend on improving governance and enhancing professional management.

### Promoting sustainable agriculture

6.46 Promoting sustainability in agriculture requires greater crop diversification, the efficient use of inputs such as water, fertilisers, and energy, and the wider adoption of sustainable practices, including integrated nutrient and pest management, as well as application of climate-resilient technologies, to protect resources and enhance long-term productivity. The government is also implementing the Crop Diversification Programme (CDP) under the Rashtriya Krishi Vikas Yojana (RKVY)<sup>109</sup> to demonstrate and promote better production technologies for alternative crops and to restore soil fertility through the cultivation of legumes.

6.47 Further, the government has been actively promoting organic and climate-resilient farming through targeted schemes such as the Paramparagat Krishi Vikas Yojana (PKVY) for all States/UTs (except the North East) and the Mission Organic Value Chain Development for North Eastern Region (MOVCDNER).<sup>110</sup> The promotion of Natural Farming (NF) through the Bhartiya Prakritik Krishi Paddhati (BPKP)<sup>111</sup> and its scaled-up version, the National Mission on Natural Farming (NMNF), is also a significant intervention. With a budget of ₹2,481 crore, NMNF has established 17,632 clusters covering 6.39 lakh hectares, trained 32,224 Community Resource Persons, and enrolled 15.79 lakh farmers.<sup>112</sup> More than 3,500 Bio-Resource Centres and 1,800 model demonstration farms have been created to provide bio-inputs and hands-on training.<sup>113</sup> Outreach initiatives have sensitised over 28 lakh farmers, while 6 lakh<sup>114</sup> farmers are

<sup>106</sup> Ibid.

<sup>107</sup> Ibid.

<sup>108</sup> Ministry of Cooperation.

<sup>109</sup> Department of Agriculture and Farmers Welfare.

<sup>110</sup> Ibid.

<sup>111</sup> Department of Agriculture and Farmers Welfare.

<sup>112</sup> Ibid.

<sup>113</sup> Ibid.

<sup>114</sup> Department of Agriculture and Farmers Welfare.

registered under the online Natural Farming Certification System (NFCS), enabling access to premium markets. Research and innovation are also being strengthened through Competitive Research Grants.<sup>115</sup>

6.48 Despite these achievements, challenges remain. Organic and natural farming still cover a small fraction of total cultivated land. The limited availability of quality inputs, uneven adoption of improved practices, and gaps in extension services all constrain scaling.<sup>116</sup>

## Food Processing

6.49 The food processing industry is among the largest employers in India's organised manufacturing sector, accounting for 12.91 per cent of total organised manufacturing employment.<sup>117</sup> In FY25, India's agri-food exports, including processed foods, totalled USD 49.43 billion, accounting for approximately 11.2 per cent of total exports. Within this, the share of processed food exports has increased steadily, rising from 14.9 per cent in FY18 to 20.4 per cent in FY25.

6.50 To support the sector's growth, the Government of India has implemented several key initiatives. The Pradhan Mantri Kisan Sampada Yojana (PMKSY) focuses on strengthening modern infrastructure and improving farm-to-retail supply chains to reduce post-harvest losses, expand processing capacity, and boost exports. As of 30 November 2025, 1,185 projects under PMKSY had been completed. In addition, the Production Linked Incentive Scheme for Food Processing (PLISFPI), launched in 2021, aims to build globally competitive food processing enterprises by supporting branding and marketing in international markets. By 31 December 2025, 169 applications had been approved under the scheme, with beneficiaries reporting investments of ₹9,207 crore and incentives disbursed amounting to ₹2,162.55 crore.

6.51 Furthermore, to provide comprehensive support—including technical, financial, and business assistance for establishing or upgrading micro food processing enterprises—the Pradhan Mantri Formalisation of Micro Food Processing Enterprises (PMFME) scheme was launched in 2020. As of 31st December 2025, 4,04,062 applications have been sent to banks and 1,72,707 loans have been sanctioned with term loan amount of ₹14.19 thousand crores. Seed Capital support has been sanctioned for 3,65,935 women SHG members amounting to ₹1277.45 crore. Additionally, the programme has successfully trained 693 Master Trainers, 1,312 District Level Trainers, and 1,36,723 beneficiaries across 36 States and Union Territories.

---

115 Department of Agriculture and Farmers Welfare.

116 Chand, R., & Singh, J. (2023). From Green revolution to Amrit Kaal. National Institution for Transforming India. GoI.

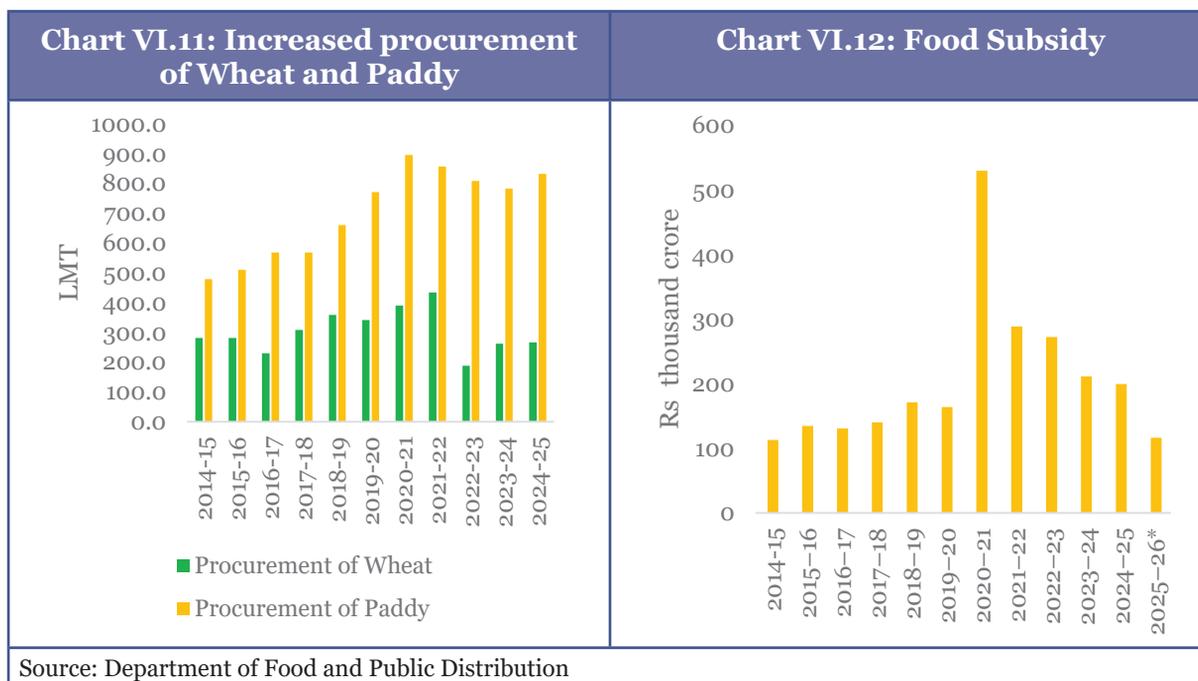
117 Ministry of Food Processing industries.

## FOOD MANAGEMENT

6.52 The government has taken various measures in recent years to strengthen both food and nutrition security and price stabilisation. To ensure food management, the government undertakes the procurement of food grains, such as Wheat, Rice, and Coarse Grains, from farmers at the Mandis, manages their movement, storage in warehouses, and distribution through the network of Fair Price Shops (FPS). Wheat, Rice and Coarse Grains are distributed free of cost to the weaker sections of the population through the Public Distribution System (PDS), particularly women and children. Sugar and edible oils, too receive government attention, given their importance in Indian food. To stabilise prices the government undertakes measures such as the Open Market Sale of staple food grains.

6.53 The government has also taken several initiatives, including leveraging new and emerging technologies to ensure food supply. The reforms undertaken in recent years have strengthened both food and nutrition security by ensuring the distribution of fortified food, enabling greater inclusiveness through Aadhaar-based deduplication and One Nation One Ration Card (ONORC) portability, expanding direct subsidy delivery via DBT, and leveraging cutting-edge digital platforms for enhanced transparency and efficiency. These measures have significantly improved the targeting of food subsidies towards the most vulnerable sections of society, particularly migrants, the urban poor and marginalised groups.

6.54 The National Food Security Act (NFSA), 2013, was introduced to provide a legal guarantee of subsidised foodgrains to nearly 67 per cent of India's population. In 1997, the Targeted PDS (TPDS) replaced the universal system, focusing on the poor by dividing households into Below Poverty Line (BPL) and Above Poverty Line (APL) categories. In 2000, the Antyodaya Anna Yojana (AAY) was introduced to support the poorest of the poor, now covering about 2.5 crore households. Under the NFSA, coverage for rural and urban populations is 75 per cent and 50 per cent, respectively, totalling around 81.35 crore beneficiaries, according to 2011 Census.



6.55 While NFSA<sup>118</sup> provides the legal framework for subsidised foodgrain distribution, the Government has, from time to time, introduced additional measures to strengthen food security during crises. It was in this context that the Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) was launched, initially as a COVID-19 relief measure, to provide free food grains in addition to NFSA entitlements. The scheme has since been continued, and under PMGKAY, foodgrains are being provided free of cost to all NFSA beneficiaries, fully funded by the Central Government. In addition to this, to improve farmers’ income, the government assist in increasing post-harvest lending through the Credit Guarantee Scheme for Electronic Negotiable Warehouse Receipt (e-NWR) based Pledge Financing (CGS-NPF). This scheme majorly focuses on Small and Marginal Farmers, Women, SC, ST and Divyangjan (PwD) farmers. Besides, MSMEs also benefited from this scheme. This scheme covers pledge loans extended on e-NWRs issued against agricultural and horticultural commodities, as well as the losses incurred by the bank due to credit and warehouseman risks.

**Box VI.6: Transforming Food Subsidy Delivery through Technology, Targeting, and Transparency.**

The government’s emphasis extends beyond food security to ensuring nutritional adequacy. By reducing the cost of essential staples, food subsidies increase disposable incomes among the covered population, enabling them to diversify their consumption basket with proteins, dairy, and horticulture products. In pursuit of this objective, multiple initiatives, such as DBT and ONORC, as well as other digital interventions, have been implemented.

118 Department of Food and Public Distribution.

ONORC has been rolled out across all 36 States/UTs, covering nearly 80 crore NFSA beneficiaries. In FY24, ₹267.6 crore was transferred directly through DBT to over 10 lakh beneficiaries in Chandigarh, Puducherry, and parts of Dadra and Nagar Haveli, and Daman and Diu, offering choice while reducing leakages. Aadhaar seeding was achieved for 99.8 per cent of ration cards<sup>119</sup> and 98.9 per cent<sup>120</sup> of beneficiaries, ensuring no exclusion of genuine poor households. Further, 99.6 per cent of 5.43 lakh Fair Price Shops (FPSs) are now equipped with Electronic Point of Sale (ePoS) devices linked to Aadhaar-based biometric authentication. Over 98 per cent of monthly foodgrain distribution is conducted through these digital transactions, significantly reducing leakages and diversion.

To enhance accuracy under NFSA, inter-database integration across platforms such as the Central Board of Direct Taxes, Goods and Services Tax Network, PM-KISAN, etc., flagged 8.51 crore<sup>121</sup> records for verification. Following field verification, over 2.12 crore ineligible beneficiaries have been removed by States/UTs, improving subsidy targeting.

Supply chain optimisation has also been prioritised. The “Anna Chakra” tool has been introduced to improve logistics, enhance efficiency, and reduce carbon emissions, while serving 81 crore vulnerable beneficiaries. In parallel, a GPS-based Vehicle Location Tracking System (VLTS) is being implemented to monitor real time movement of foodgrain transport vehicles. This initiative has been fully implemented in six states: Andhra Pradesh, Bihar, Gujarat, Telangana, Uttar Pradesh, and Delhi. It is partially implemented in ten States/UTs, with rollout in the remaining States/UTs targeted for completion by March 2026.

## CONCLUSION

6.56 Agriculture will be central to achieving Viksit Bharat, driving inclusive growth and improving the livelihoods of millions. India has made notable progress in increasing agricultural production, particularly in key sectors such as dairy, poultry, fisheries, and horticulture, which collectively contribute significantly to the country's GDP.<sup>122</sup> The strengthening of cooperatives and the rise of farmer-producer organisations (FPOs), have further expanded access to credit, innovative technology, and efficient value chains. These entities play a vital role in empowering small and marginal farmers by facilitating collective bargaining and ensuring fair prices for their produce. Additionally, the adoption of digital technologies, such as the Digital Agriculture Mission, and e-NAM which connects farmers with markets, is increasing transparency and competition.<sup>123</sup>

6.57 However, the agricultural sector faces substantial challenges that threaten its

119 Department of Food and Public Distribution.

120 Ibid.

121 Department of Food and Public Distribution.

122 Birthal, P. S., Joshi, P. K., Negi, D. S., & Agarwal, S. (2014). Changing sources of growth in Indian agriculture: Implications for regional priorities for accelerating agricultural growth (IFPRI Discussion Paper No. 1325). International Food Policy Research Institute.

123 Department of Agriculture and Farmers Welfare..

sustainability and productivity. Climate change poses a significant challenge, with erratic weather patterns, rising temperatures, and extreme events affecting crop yields. Water scarcity is a pressing and critical challenge in regions that are predominantly dependent on monsoon rainfall. Addressing these challenges necessitates region-specific interventions tailored to local agro-climatic conditions and natural resource availability. Promoting climate-resilient agricultural practices, such as drip irrigation and sprinkler systems, as well as diversifying to high-yield, an appropriate crop mix of climate resilient/drought resistant crops, is critical for sustainability.

6.58 While investment in research and development has been a hallmark of Indian agriculture through a strong and robust research ecosystem, continuity with focus on innovation in agricultural practices, improved seed varieties that are resistant to pests, diseases, and climate stresses, as well as modern farming techniques that maximise resource efficiency, will be key to enhancing long-term productivity. Furthermore, the widespread adoption of digital technologies, including precision agriculture tools and data analytics, can significantly optimise farming operations and yield predictions.

6.59 Indian agriculture is entering a phase of new opportunity, supported by advances in irrigation, digital extension, improved storage, and the strengthening of cooperatives and value chains. Yet, structural challenges such as small landholdings, climate risks, productivity gaps, and weak market integration continue to weigh on farm incomes<sup>124</sup>. The way forward lies in deepening ongoing reforms, promoting climate-resilient technologies, empowering FPOs, strengthening cooperatives, improving markets and logistics, and improving risk management.

6.60 With sustained investment and innovation, agriculture can become more resilient, competitive, and income enhancing.<sup>125</sup> Strengthening private sector participation in areas such as food processing, cold chain logistics, and the development of high-value agricultural products will be crucial to increasing competitiveness in both domestic and export markets.<sup>126</sup> Expanding high-growth sectors, such as horticulture, agroforestry, dairy, poultry, and fisheries, can further support inclusive economic development and job creation, particularly for rural communities.

6.61 In conclusion, key priorities for the agriculture sector include strengthening access to assured water supply by strengthening irrigation systems that include reviving

---

124 Chand, R., & Singh, J. (2023). From Green revolution to Amrit Kaal. National Institution for Transforming India. GoI.

125 Chand, R., & Singh, J. (2023). From Green revolution to Amrit Kaal. National Institution for Transforming India. GoI. .

126 Birthal, P. S., Hazrana, J., & Negi, D. S. (2020). Diversification in Indian agriculture towards high-value crops: Multilevel determinants and policy implications. *Land Use Policy*, 91.

and rejuvenating water bodies and drip irrigation; enhancing agricultural research and development through coordinated public and private efforts to improve climate resilience, productivity, and farm incomes; undertaking reforms in the fertiliser sector to promote sustainability, restore soil carbon, and correct imbalanced nutrient; and promoting crop diversification that responds to water availability, improves soil fertility and agricultural productivity.

\*\*\*

*This page has been left blank*

# SERVICES: FROM STABILITY TO NEW FRONTIERS

*This chapter offers a comprehensive analysis of India's evolving services sector, which has become the principal engine of economic growth, resilience, and structural transformation. Against a backdrop of global uncertainty and subdued global industrial activity, the services sector has emerged as a stabilising force, contributing more than half of India's Gross Value Added and serving as a major driver of exports and employment. The chapter situates India's performance within global trends, highlighting the sector's rapid expansion in digitally delivered, knowledge-intensive, and experience-led segments, as well as its comparative strength in trade and foreign direct investment.*

*Through a detailed examination of recent developments and high-frequency indicators, the chapter demonstrates how services have underpinned economic momentum, buffered external shocks, and supported urban employment dynamics. Sub-sector analyses—spanning tourism, IT and IT-enabled services, transport, telecommunications, real estate, media and entertainment, and space services—reveal both the diversity and the emerging opportunities within the sector. The discussion brings out critical reform measures, including developing new niche areas like the Orange economy, new hiking trails, marina development and Ocean commercialisation so that India's services sector remains a powerful engine of sustained and inclusive economic growth in the years ahead.*

## INTRODUCTION

7.1. The global economy is undergoing a structural shift marked by the ascendance of the services sector as the principal engine of growth, resilience, and cross-border integration. In recent years, global output expansion has moderated, constrained by subdued industrial activity, supply-chain realignments, and heightened geopolitical uncertainty. Amid these headwinds, the services sector has emerged as a stabilising force, contributing more to the growth. Notably, while global goods trade has stagnated, services trade has continued to expand, reinforcing its role as a critical buffer against external shocks and volatility.<sup>1</sup>

<sup>1</sup> UN Conference on Trade and Development (UNCTAD). (2025). Global Trade Update - December 2025. [https://unctad.org/system/files/official-document/ditcinf2025d10\\_en.pdf](https://unctad.org/system/files/official-document/ditcinf2025d10_en.pdf)

7.2. The rapid expansion of digitally and remotely deliverable services has allowed the services sector to scale swiftly by transcending traditional geographical and operational constraints. This has enabled new forms of value creation, particularly in knowledge-intensive and technology-enabled activities, helping even smaller economies leave a global imprint. In contrast to the typical manufacturing-led growth paths followed by other countries at a comparable stage of development, India has experienced service-led growth at a significantly lower level of per capita income.

7.3. Currently, India's services sector contributes more than half of the Gross Value Added and serves as a major driver of exports and employment in the country. Not only does it continue to underpin domestic growth, but services have also emerged as the most stable and resilient component of GDP, acting as a high-growth, low-volatility anchor, as is the case across the globe. The sector has recorded average annual growth of around 7-8 per cent year after year, in sharp contrast to the more pronounced cyclical fluctuations observed in agriculture and industry.<sup>2</sup> India is the world's seventh-largest exporter of services, with its share in global services trade more than doubling from 2 per cent in 2005 to 4.3 per cent in 2024<sup>3</sup>, and the sector continues to be the largest recipient of foreign direct investment inflows.

7.4. Even as services continue to anchor growth, the rapid technological progress which helped services ascend scales is now outpacing the growth in firm-level and worker-level adaptation, creating skill gaps and disruptions. Coupled with tighter immigration, data protection/localisation norms and remittance rules, the promise of being the 'stabilising force' is now under challenge.

7.5. Building on this context, the chapter first reviews global trends in the services sector, placing India's performance in an international context. It then assesses recent developments in India's services sector during the current year, followed by an analysis of performance across major sub-sectors, highlighting key strengths and emerging opportunities. The chapter concludes with a discussion of the main challenges and policy priorities for sustaining services-led growth.

## GLOBAL SERVICES TRENDS AND INDIA'S EXPERIENCE

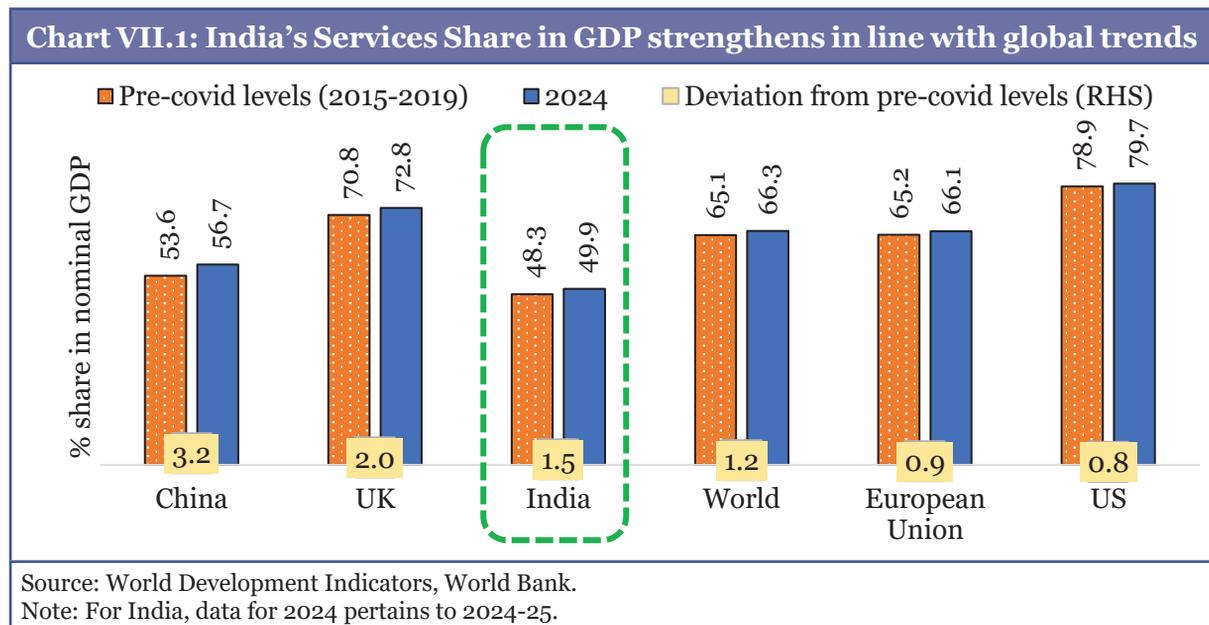
### Structural Rebalancing and Evolving Growth Dynamics

7.6. The COVID-19 pandemic severely disrupted contact-intensive services, such as tourism, hospitality, and transport, while accelerating the expansion of digitally

<sup>2</sup> The standard deviation of growth rate for services during FY 05-25 is 1.22 compared to 4.20 for manufacturing, 3.07 for industry and 1.5 for overall GDP.

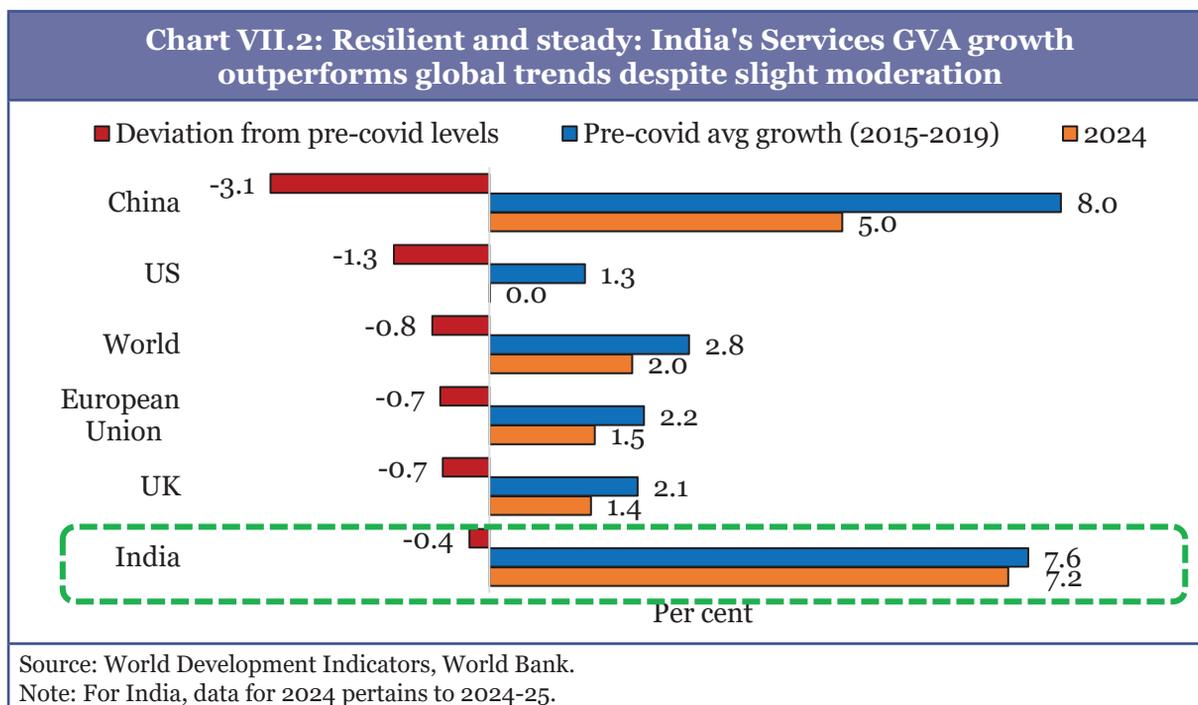
<sup>3</sup> As per latest available data from WTO.

delivered services, including IT, finance, and professional services. This has thereby reshaped the structure and growth dynamics of the services sector. Since the latter is of high value, this compositional shift post-pandemic has raised the share of services in global gross value added, even as overall services growth has moderated relative to the pre-pandemic period (2015-19).<sup>4</sup> India has followed this trajectory with greater momentum relative to most peers (Chart VII.1). For instance, as per World Bank data, India’s share of services in GDP rose by about 1.5 percentage points above its pre-pandemic average to reach 49.9 per cent in 2024, an increase larger than that observed globally and across major advanced economies.



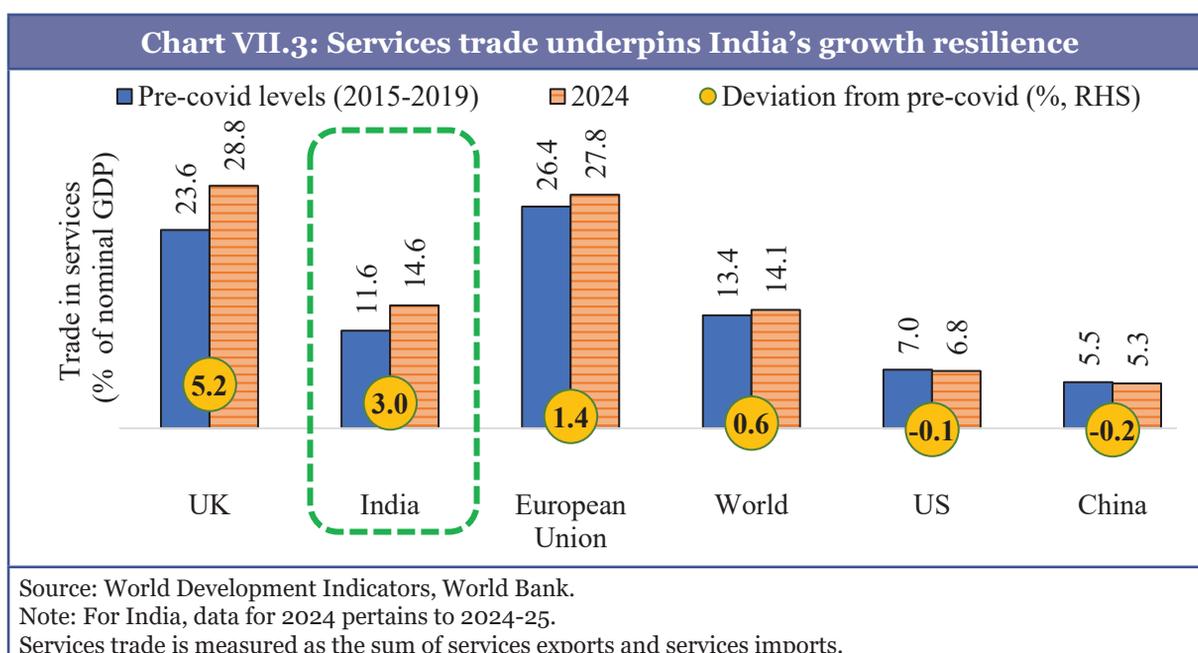
7.7. As mentioned above, notwithstanding the rising share of services in GDP, services growth in the post-pandemic period has faced headwinds from slower global growth, weaker expansion of trade and investment-linked services, and subdued productivity gains, particularly in labour-intensive segments. China has experienced the sharpest deceleration among major economies. India, by contrast, has remained relatively resilient, with services growth in 2024 staying close to its pre-pandemic levels (Chart VII.2).

4 Throughout the chapter, FY16-FY20 is taken as pre-pandemic period (for global comparison the same period corresponds to calendar year 2015-19) and the post-pandemic period is assessed using FY23-FY25, with FY21 and FY22 excluded due to base effects arising from the COVID shock.

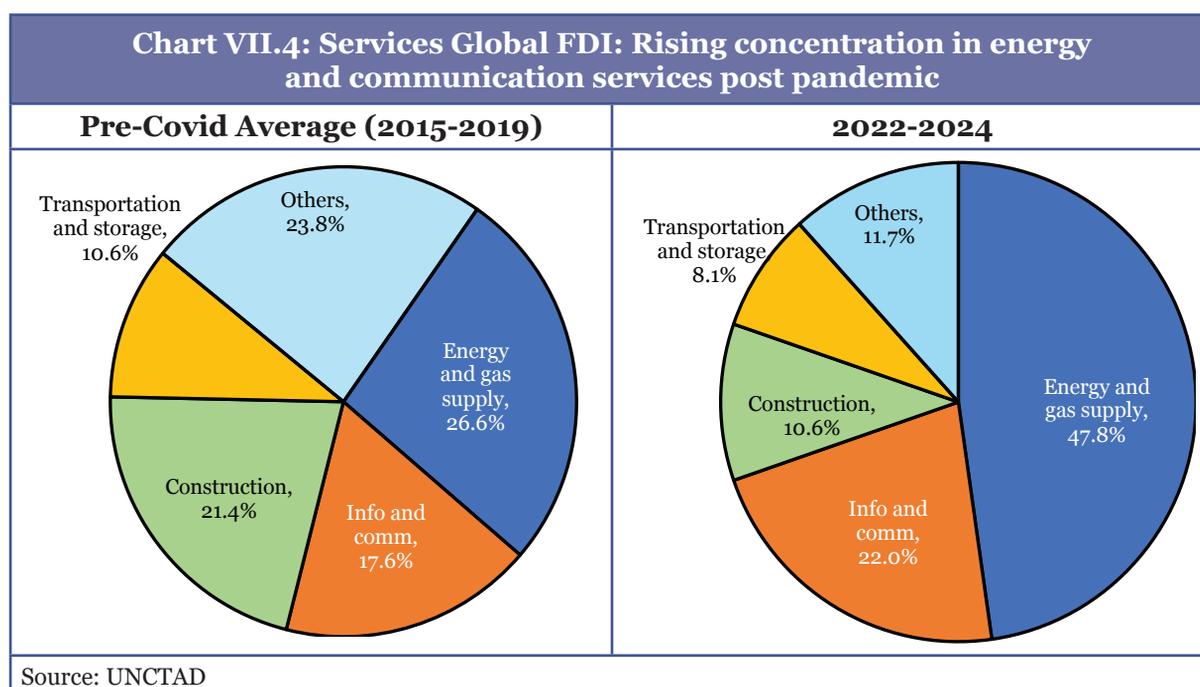


### Shifts in trade and capital flows in the services sector

7.8. These structural shifts are increasingly evident in global services trade patterns. In 2024, the share of services trade in GDP rose relative to pre-pandemic levels, signalling a gradual, though uneven, rebalancing of global trade towards services. Underscoring its comparative strength in digitally deliverable and globally tradable services, India recorded a relatively stronger expansion in services trade as a share of GDP compared to its pre-pandemic average (Chart VII.3), while several advanced economies saw only marginal gains or slight declines.



7.9. This growing role of services in global trade has been mirrored by a corresponding shift in capital allocation. Services accounted for an average 53.5 per cent of global FDI<sup>5</sup> during 2022-2024, up from 50.9 per cent in the pre-pandemic period, with inflows becoming increasingly concentrated. Energy and gas supply, information and communication, construction, and transportation together absorbed over 88 per cent of services FDI, compared to 75.5 per cent before the pandemic (Chart VII.4). Further, it is observed that global services FDI had a relatively balanced structure pre-COVID with allocation reasonably spread out across these sectors. However, post-COVID (2022-2024), FDI flows have been skewed towards a more energy-centric and strategic profile. This reflects a growing investor preference for services linked to energy security, digital connectivity, infrastructure, and supply chains.



7.10. India’s experience broadly mirrors these global trends. Services-sector FDI inflows<sup>6</sup> accounted for an average 80.2 per cent of total FDI during FY23-FY25, up from 77.7 per cent in the pre-pandemic period (FY16-FY20), underscoring the growing role of services in attracting foreign investment. These inflows remain highly concentrated, led by information and communication services (25.8 per cent) and professional services (23.8 per cent), reflecting India’s strength in digital and knowledge-intensive activities. Finance and insurance (14.2 per cent), energy and gas (12.8 per cent), and trading (12.2 per cent) also drew significant investment. Together, these segments

5 FDI estimates are based on announced greenfield investment projects, sourced from UNCTAD, and exclude cross-border mergers and acquisitions.

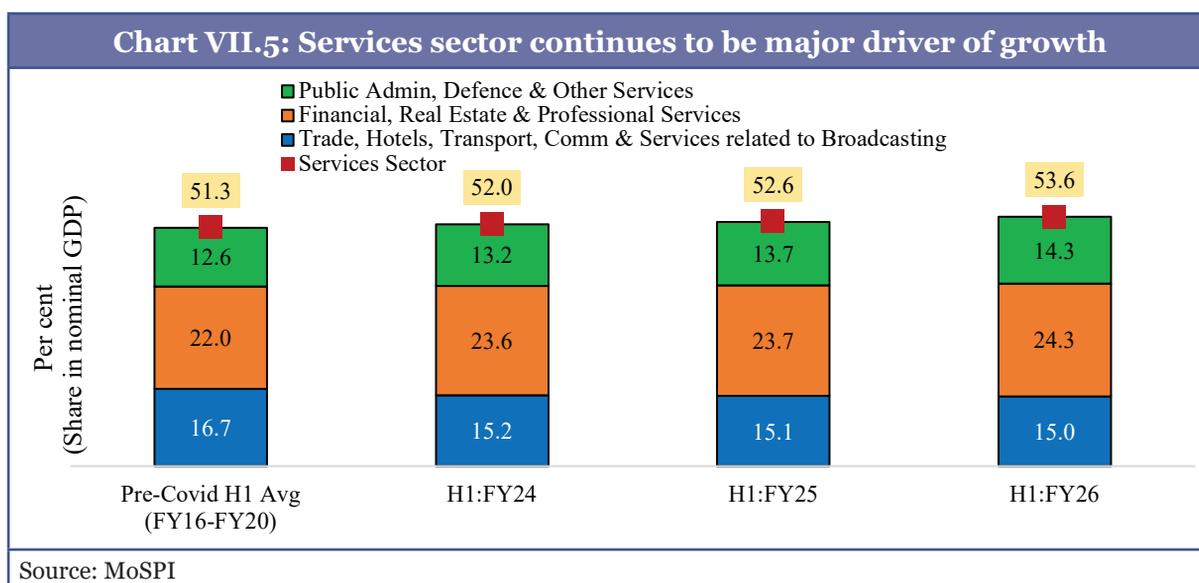
6 Services FDI is computed using the UNCTAD sectoral classification, which adopts a broader definition of services compared to the classification used by the DPIIT for reporting FDI equity inflows.

accounted for nearly 89 per cent of services FDI, highlighting the dominance of digital, skill-intensive, and infrastructure-linked services in India's investment profile.

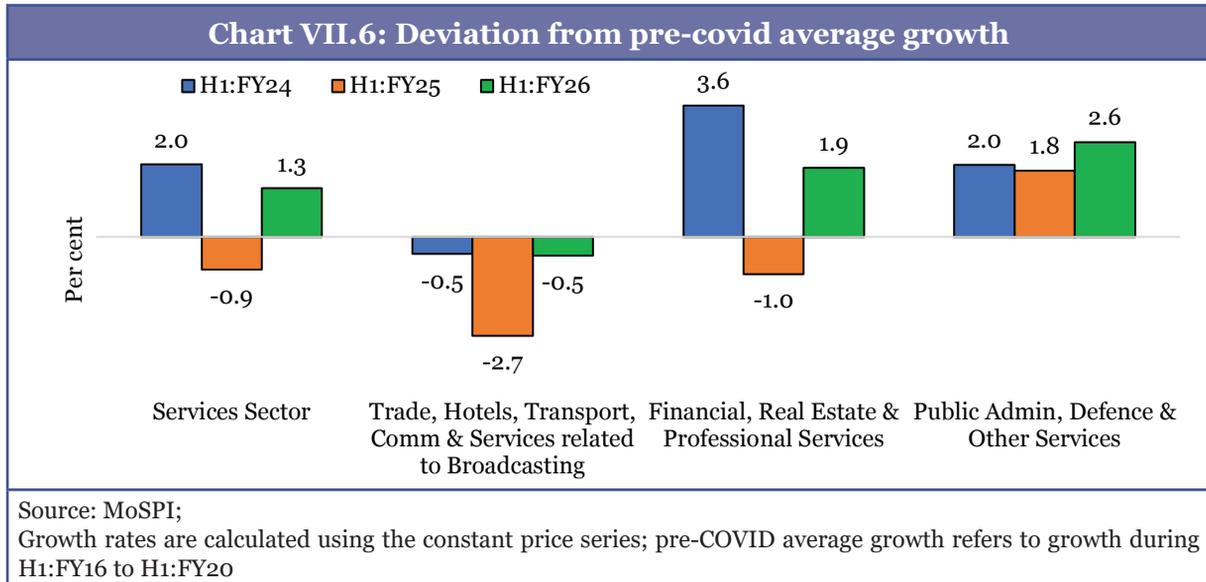
## RECENT TRENDS IN INDIA'S SERVICE SECTOR PERFORMANCE

### Services sector underpins economic growth in H1 FY26

7.11. The discussion so far highlights that, in recent years, India's services sector has performed relatively strongly in comparison to global developments. The current year, however, has been marked by heightened uncertainty and shifts in geopolitical alignments across countries. Despite these conditions, the services sector in India gained momentum in H1 FY26, with its share in GDP rising to 53.6 per cent, higher than that in H1 FY25 and the pre-pandemic period (H1 FY16-H1 FY20) (Chart VII.5). Underlying this acceleration is the growth in services GVA by 9.3 per cent in H1 FY26, up from 7.0 per cent in the corresponding period of FY25.



7.12. Sub-sector data reveal that the 'financial, real estate, and professional services' sector remains the key driver of service growth. The growth was supported by sustained demand for credit, business services, and real estate-linked activities, with both growth and GVA share exceeding pre-pandemic levels. 'Public administration, defence and other services' have also continued to expand at a pace above pre-pandemic trends, underpinned by steady public spending and service delivery. In contrast, 'trade, hospitality, transport, communication and related services' have seen a more gradual normalisation, with growth broadly close to pre-pandemic averages. However, its overall contribution is yet to fully recover, reflecting ongoing adjustments in contact-intensive and mobility-dependent activities.



7.13. While H1 FY26 performance highlights the near-term resilience of services, Box VII.1 situates these developments within a longer-term structural transformation of the sector, drawing on recent evidence from NITI Aayog.

**Box VII.1: NITI’s findings on state-level and sector-level dynamics**

In October 2025, NITI Aayog<sup>7</sup> undertook a first-of-its-kind disaggregation of India’s services sector into 15 major sub-sectors, offering a decadal assessment of structural transformation across output, employment and regional dynamics. The two-volume report highlights the emergence of services not only as the largest contributor to output, but also as a key transmission channel linking economic growth, employment generation, urbanisation and state-level convergence. While services have expanded faster than the overall economy, their capacity to absorb labour is not insignificant, contrary to general perceptions, though employment is increasingly uneven across sub-sectors and states.

Services account for around 30 per cent of total employment, substantially higher than manufacturing and construction, which employ about 11-12 per cent each, implying that services now employ more people than industry as a whole. Over 2011-2024, employment elasticity in services stood at 0.43, compared with 0.22 in manufacturing, 0.41 in agriculture, and 0.60 in construction. Services added nearly 40 million jobs over the past six years, with employment elasticity rising to 0.63 in the post-COVID recovery phase, second only to construction, underscoring the sector’s role as a labour shock absorber.

At the same time, a services employment-output paradox is becoming evident. Rapid GVA growth in high-end services has not translated proportionately into job creation, due to their high skill intensity and automation. Consequently, most new employment continues to be

<sup>7</sup> NITI Aayog. (2025, October). India’s services sector: Insights from GVA trends and state-level dynamics. Government of India. (<https://tinyurl.com/3sc84ukb>)  
NITI Aayog. (2025, October). India’s services sector: Insights from employment trends and state-level dynamics. Government of India. (<https://tinyurl.com/56kdzxp>)

generated in low-value-added subsectors like trade, hospitality, transport and personal services. Globally, as per ILO data, the share of workers employed in services rose from 35.5 per cent in 1992 to 49.8 per cent in 2022 (14.3 percentage points increase), with sharper increases in upper-middle-income countries (which saw 21.8 percentage point increase). India's transition has been more gradual, with services employment rising from 22.1 per cent to 30.0 per cent over the same period (an 8.9 percentage point increase). However, with 51.5 per cent of service workers in regular wage employment, compared with 1 per cent in agriculture and 25.5 per cent in industry, the job quality in services remains superior.

Between 2011-12 and 2023-24, traditional segments such as trade and repair, and professional, scientific and business services, maintained GVA shares of around 20 per cent each. In contrast, computer and information services more than doubled their GVA share from 6.0 per cent to 12.2 per cent. Pension and insurance services declined from 1.7 per cent to 1.1 per cent, while other financial services remained stable at about 10 per cent. Education recorded a modest increase from 6.7 per cent to 7.4 per cent; health remained broadly stable at around 2.8 per cent; and sectors such as telecommunications, audiovisual services, postal and courier services, and travel saw marginal declines. Transport, cultural and recreational services experienced sharper reductions in their GVA shares.

This diversity is mirrored in state-level performances. Karnataka, Maharashtra, Tamil Nadu and Telangana together account for nearly 40 per cent of services output, driven by modern, high-productivity services such as IT, finance and professional services, resulting in a concentration of output in highly urbanised states, particularly in southern India.<sup>8</sup> At the same time, important contrasts persist. Bihar, despite low per capita income, derives 58.7 per cent of its GVA from services, largely from low-value-added activities. Kerala, with 64.3 per cent of GSVA from services, remains reliant on traditional segments such as trade, tourism and real estate. In some cases, the services share declined, challenging the notion of one-way transition towards services: Odisha's services share declined from 38.5 per cent to 34.9 per cent, while Assam's fell from 46.5 per cent to 34.3 per cent over the period.

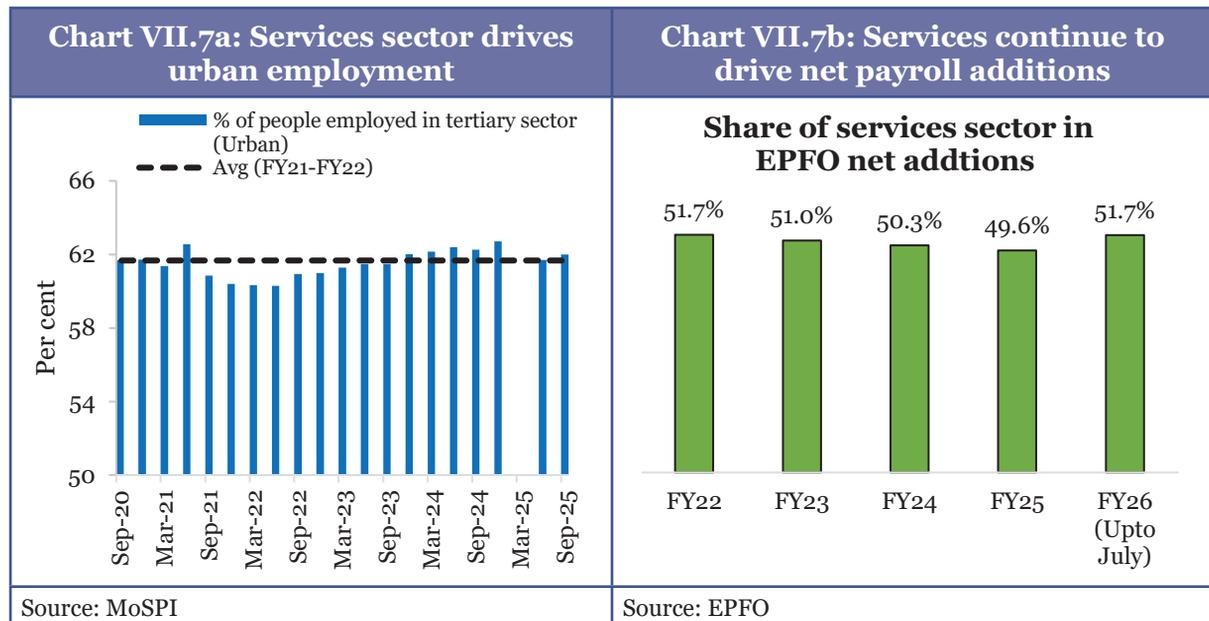
Services employment in India remains predominantly urban, with over 60 per cent of urban workers engaged in services, compared with less than 20 per cent in rural areas. Gender disparities persist, particularly in rural services employment, where only 10.5 per cent of women are engaged in services, compared with nearly 60 per cent in urban areas. At the same time, select sub-sectors show notable reversals in wage gaps. In information and communication services, urban women earn about ₹2,000 per day, compared with ₹729 for men. Similar patterns are observed in healthcare (₹542 for women versus ₹480 for men), and in rural education and public administration, where female wages exceed those of male counterparts.

## Services sector remains central to urban employment dynamics

7.14. PLFS data for the first two quarters of FY26 show that the share of services in urban employment rose to 61.9 per cent (on average), marginally higher than the FY21-

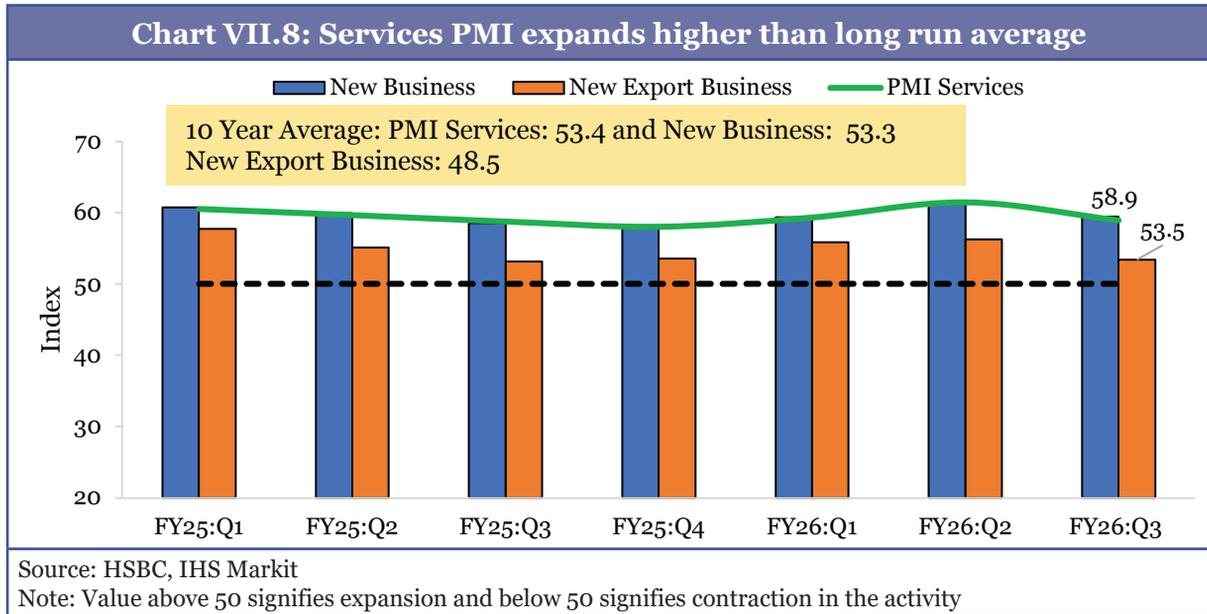
<sup>8</sup> Delhi has a higher service share in GVA, however, arising from greater presence of public administration, being the capital city-state.

FY22 average of 61.7 per cent, a period marked by relatively strong services-sector hiring during the pandemic (Chart VII.7a). Consistent with this, EPFO data for April-July FY26 indicate sustained formal job creation, with services accounting for 51.7 per cent of net employment additions (Chart VII.7b), led by expert services, trading and commercial establishments, and cleaning services. Together, these trends underscore the central role of services in strengthening labour market resilience amid global uncertainty.

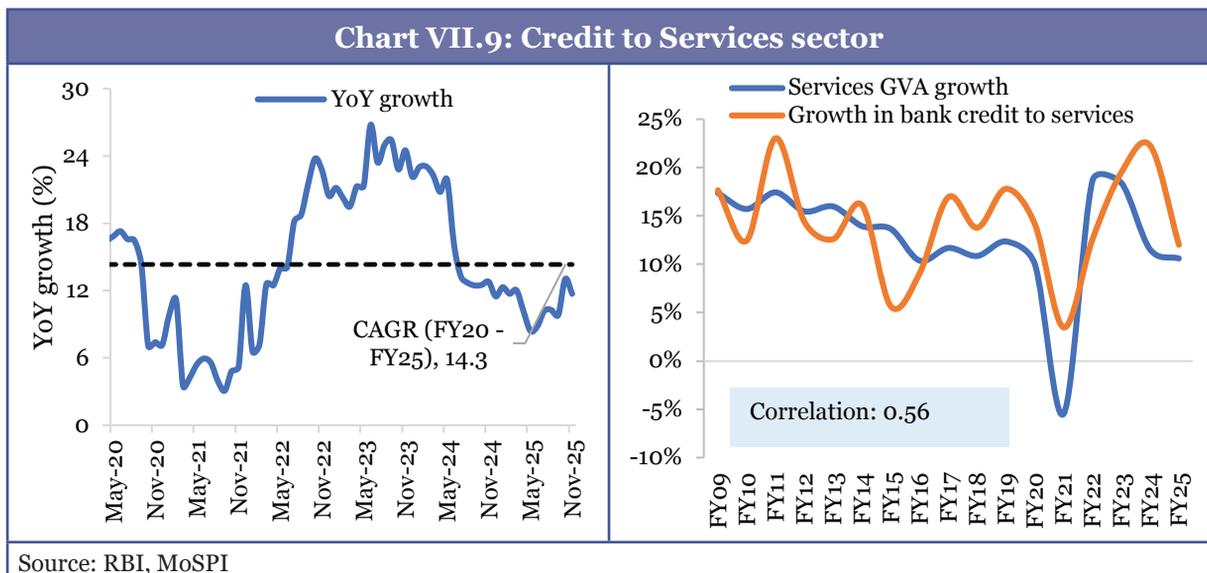


### High-frequency indicators signal steady growth in H2 of FY26

7.15. High-frequency indicators suggest a continued strengthening of service activity in Q3 FY26. The PMI Services Index remained firmly in the expansionary territory (marked by a reading above 50), averaging 58.9 during Q3 of FY26. This was driven by robust domestic demand, as reflected in the new business intakes that remained well above their long-run average of 53.3 (Chart VII.8). International sales also continued to expand to 53.5, above the long-period average of 48.5, although the pace of growth moderated to a four-quarter low, amid heightened global competition and protectionism.



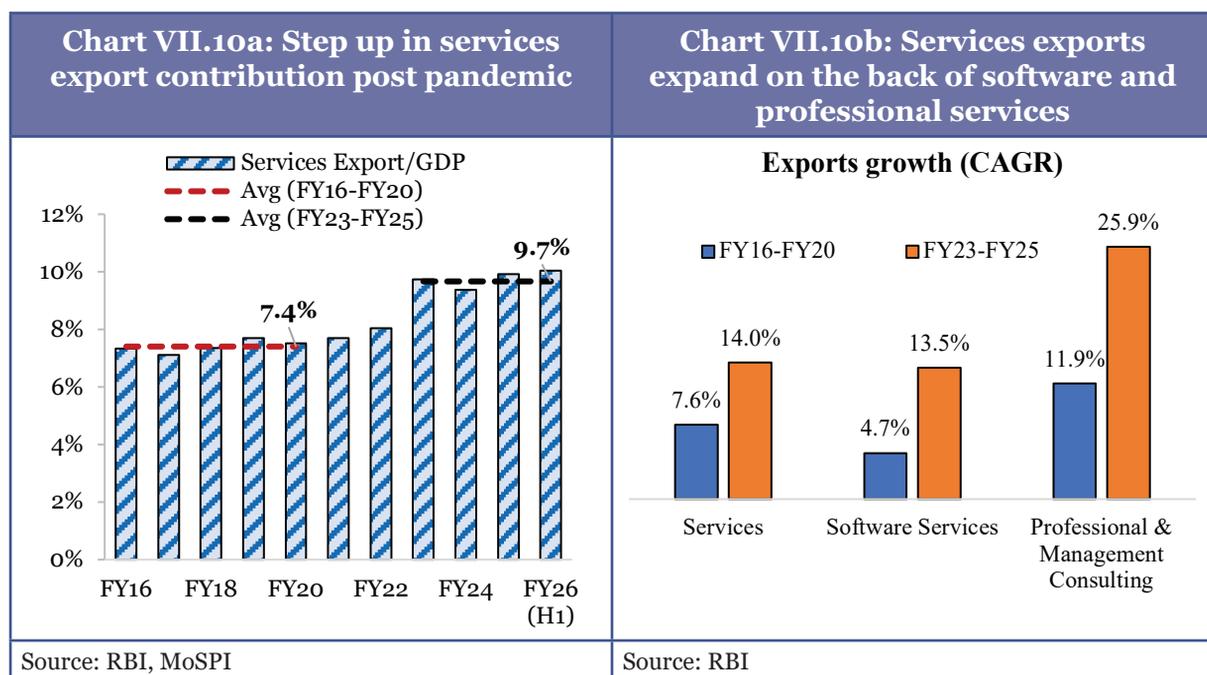
7.16. Bank credit growth in services has remained supportive in recent months, with the pace of expansion moving closer to its five-year average of ~14 per cent (Chart VII.9) after the cyclical downturn and sharp recovery during the pre- and post-pandemic periods. From an average 9.9 per cent growth during April-September 2025, credit to the services sector strengthened further, registering an average growth of 12.4 per cent year-on-year in October-November 2025. This acceleration was largely driven by a rebound in lending to Non-Banking Financial Companies (NBFCs), supported by rising demand from the retail and MSME segments, aided by the rationalisation of GST rates. Credit flows to other service segments, such as tourism, hotels, restaurants, and trade, have also gained momentum. Credit growth and GVA growth in services are fairly positively correlated. Overall, these trends indicate that financing conditions have remained responsive to evolving demand conditions in the services sector.



### Services exports as a buffer amid global uncertainty

7.17. Mirroring global trends, services exports have become a central pillar of India’s external sector and a key driver of growth. Their share in GDP averaged 9.7 per cent during FY23-FY25,<sup>9</sup> up from 7.4 per cent in the pre-pandemic period (Chart VII.10a). Amid subdued global goods trade due to policy uncertainty and geopolitical disruptions, services exports have provided a critical buffer. This role has strengthened further in H1 FY26, with the share of services exports in GDP rising to 10.0 per cent, from 9.7 per cent in H1 FY25.

7.18. The growing role of India’s services exports is reflected in the marked acceleration in its growth over recent years. Average growth in services exports has more than doubled from 7.6 per cent in the pre-pandemic period (FY16-FY20) to 14.0 per cent during FY23-FY25, reflecting strong and broad-based global demand for Indian services. Amid increasingly competitive conditions in global services markets and heightened policy uncertainty, services export growth moderated to 8.0 per cent during FY26 (April-November). Notwithstanding this moderation, growth has remained above pre-pandemic levels, indicating that the underlying momentum in services exports has been maintained.



7.19. The composition of services exports further reinforces this assessment (Chart VII.10b). Software services, accounting for over 40 per cent of total services exports, remain the primary growth driver, expanding at an average rate of 13.5 per cent during FY23-FY25 compared to 4.7 per cent in FY16-FY20, supported by strong global

<sup>9</sup> As mentioned in footnote 4

demand for digital services. Professional and management consulting services have emerged as the second-largest contributor, driven by a more than doubled growth rate of 25.9 per cent, resulting in an increase in their share from 10.5 per cent in FY16-FY20 to 18.3 per cent in FY23-FY25. Together, these segments account for over 65 per cent of services exports, highlighting India's growing specialisation in cross-border, knowledge-intensive activities. Sustaining services export growth will depend on continued diversification within services and further movement up the value chain, in line with evolving global demand patterns and regulatory environments. In this context, Box VII.2 examines the role of artificial intelligence in shaping India's services export performance, highlighting the differential impact of AI adoption across services segments and its implications for India's growing specialisation in digitally deliverable, knowledge-intensive exports.

### Box VII.2: Artificial Intelligence and India's Services Exports

Artificial intelligence (AI) is increasingly shaping global services trade, particularly digitally deliverable services. Emerging evidence suggests a two-way relationship between AI innovation and trade: advances in AI reduce trade costs and increase productivity, while increased cross-border services trade, in turn, accelerates technological diffusion. The WTO estimates that AI could raise global trade by 34-37 per cent by 2040, with digitally deliverable services expanding by about 42 per cent, driven by lower trade costs and higher productivity.<sup>10</sup> Conversely, a 10 per cent increase in digitally deliverable services trade is associated with a 2.6 per cent rise in cross-border AI patent citations across borders, underscoring the mutually reinforcing nature of trade and AI-driven innovation. India is well positioned to benefit from these trends, supported by a strong IT-BPM ecosystem and a rapidly expanding AI talent base. According to Stanford University's Artificial Intelligence Index Report 2025, India recorded the largest increase in AI talent among major economies between 2016 and 2024.

To assess the impact of AI on India's services trade, the Survey undertook an analysis using a two-way fixed effects difference-in-difference (DiD) framework using quarterly RBI balance of payments data for Q1:FY18 to Q2:FY26.<sup>11</sup> The analysis compares presumably AI-intensive services—software, business, and financial services—with less AI-exposed services, including travel, transport, insurance, government services n.e.c., and communication services, with Q2 FY23 as the intervention period.

The analysis reveals that AI-intensive services exports grew significantly faster than less AI-exposed services after the AI diffusion phase. The estimated coefficient implies, on average, an approximate 39.5 per cent increase in exports of the AI-exposed (treated) categories relative to the other (control) categories.

<sup>10</sup> World Trade Organisation. (2025). World Trade Report 2025: Making Trade and AI Work Together to Benefit All. Geneva: WTO, <https://tinyurl.com/mwz3nfwc>

<sup>11</sup> The regressions were estimated in logarithmic form, allowing coefficients to be interpreted as approximate percentage changes while mitigating scale differences across service categories. Formal tests find no evidence of differential pre-intervention trends between the treatment and control groups, supporting the validity of the DiD framework.

**Table A: Overall Impact of AI Adoption on Services Exports**

Variable	Estimate	Significance	Implied Export Increase
Post Treatment	0.333*	1%	~39.5%

Source: Author's calculation

The sub-category-wise results show that export gains are higher in software and business services, while the effect for financial services, although positive, is not statistically significant during the period under consideration.

**Table B: Category-specific Effects of AI Adoption on Services Exports**

Services Category	Post × Treatment Coefficient	Significance	Implied Export Increase
Software services	0.37*	1%	~44%
Business services	0.51*	1%	~67%
Financial services	0.12	Insignificant	

### Trade agreements for promoting services

7.20. As India's services exports expand and move up the value chain, trade policy has become central to facilitating cross-border delivery and reducing regulatory frictions. India has increasingly leveraged free trade agreements, comprehensive economic partnerships, and bilateral engagements to enhance market access and competitiveness, with a focus on professional mobility, regulatory cooperation, and digital trade. Amid the realignment of global trade relationships, ongoing and completed agreements aim to further ease barriers and support services exports. An overview of these initiatives is presented in Box VII.3 below.

**Box VII.3: India's Trade Agreements and Engagements for 2025 Relevant for Services**

Agreement / Engagement	Gains for the services sector
India-UK CETA Concluded (Jul 2025) <sup>12</sup>	<ul style="list-style-type: none"> <li>The UK has granted comprehensive market access across 137 services sub-sectors, reducing barriers and easing cross-border mobility.</li> <li>Mutual Recognition Agreements (MRAs) in nursing, accountancy, and architecture, along with assured temporary entry and stay provisions, facilitate the movement of Indian professionals; a dedicated annual quota of 1,800 positions supports chefs, yoga instructors, and classical musicians.</li> </ul>

<sup>12</sup> <https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=154945>

	<ul style="list-style-type: none"> <li>• The Double Contribution Convention eliminates dual social security payments for assignments up to 36 months, benefiting over 75,000 professionals and 900 firms, with annual savings exceeding USD 500 million and improved cost competitiveness.</li> <li>• Strong commitments on digitally delivered services (Mode 1) cover IT, professional consultancy, education and training, and telecom, while Mode 3 commitments (commercial presence) open investment opportunities for Indian firms in areas such as management consultancy, education, and environmental services.</li> <li>• CETA is expected to benefit major services segments by enabling deeper collaboration in digital, AI, fintech, and cloud services; supporting innovation-focused partnerships benefiting both large and niche companies; repositioning India from a low-cost back-office destination to a strategic R&amp;D and technology partner; and expanding opportunities in healthcare and education through institutional collaboration and MRAs.</li> </ul>
India-Oman CEPA (Concluded in Dec 2025) <sup>13</sup>	<ul style="list-style-type: none"> <li>• Oman has offered commitments in 127 services sub-sectors, covering computer-related services, business and professional services, audio-visual services, R&amp;D, education, and health services, thus unlocking new opportunities and promoting high-value job creation.</li> <li>• Enhanced Mode 4 commitments for the mobility of Indian professionals include: <ul style="list-style-type: none"> <li>• Higher quota for intra-corporate transferees (raised from 20 per cent to 50 per cent)</li> <li>• Longer permitted stays for contractual service suppliers</li> <li>• More liberal entry and stay conditions for skilled professionals in key sectors such as accountancy, taxation, architecture, medical and allied services.</li> </ul> </li> <li>• The CEPA further provides for 100 per cent FDI by Indian companies in major services sectors in Oman through commercial presence.</li> </ul>
India-European Free Trade Association (EFTA) Trade and Economic Partnership Agreement (TEPA) (In force since Oct 2025) <sup>14</sup>	<ul style="list-style-type: none"> <li>• TEPA will provide opportunities for services sector to access more markets, through digital delivery (Mode 1), commercial presence (Mode 3), and greater certainty for entry and temporary stay of key personnel (Mode 4).</li> </ul>

<sup>13</sup> <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2205889>

<sup>14</sup> <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2173138>

- The agreement will stimulate services exports in sectors such as IT and business services, cultural and recreational services, education, and audio-visual services
- MRAs under TEPA open new opportunities in professional services such as nursing, chartered accountancy, and architecture.

7.21. The contribution of services exports is well established in terms of output, external balances and competitiveness. A complementary consideration is the nature of their wider institutional spillovers, particularly whether export dynamism creates economy-wide incentives for improvements in execution capacity. Box VII.4 examines this question, focusing on differences in the way goods and services connect to system-wide public infrastructure and regulatory capabilities.

#### BoxVII.4: Can the export of services help improve state capacity?

The claim that services exports cannot play the same disciplining role as goods exports is not a judgment about their economic value or sophistication. It is a claim about how different forms of production interact with institutions, incentives, and state capacity. The distinction is structural, not sectoral.

The disciplining effect that matters is whether success and failure in a sector transmit pressure back into the wider system, forcing firms to abandon influence-seeking strategies and compelling the state to upgrade its execution capacity because incompetence becomes fiscally, politically, and macroeconomically costly. Historically, services exports have not transmitted that pressure.

The first reason is that services exports are inherently firm-selective rather than system-forcing. A globally competitive services firm can operate at high efficiency while largely bypassing the domestic institutional environment. Software, design, consulting, finance, and digital services rely primarily on human capital, bandwidth, legal contracting, and reputation. They do not require ports to function efficiently, customs to clear on time, industrial land to be assembled at scale, or municipal services to work reliably. As a result, services firms can succeed inside what is otherwise a weak or fragmented state.

Because these firms do not depend on the weakest parts of the state, they have little incentive to force improvement in those areas. They adapt around institutional failure instead of confronting it. The state, in turn, faces no compulsion to upgrade because its failures do not immediately threaten export earnings, large-scale employment, or fiscal stability.

The second reason is that services exports allow exit without voice. That is, when goods exporters face domestic bottlenecks—such as ports, power, logistics, and inspection regimes—they must address them or fail. Their capital is sunk, their supply chains are rooted, and exit is costly and visible. Services firms, by contrast, can relocate teams, invoice through offshore entities, arbitrage jurisdictions, or simply shift work across borders with

relatively low friction. When institutions become burdensome, the most productive firms leave quietly. That behaviour is rational at the firm level but is unhelpful at the system level, because it removes precisely the actors who might otherwise pressure the state to improve.

The third reason is that services exports do not impose hard budget constraints on the state. Goods exports typically anchor large employment bases, supplier ecosystems, logistics networks, and regional economies. When they falter, the effects show up quickly in trade balances, employment numbers, bank balance sheets, and political pressure. On the other hand, services exports, even when large in foreign exchange terms, are far less employment-intensive per dollar earned, geographically concentrated, and weakly linked to domestic supply chains. A slowdown hurts incomes in specific urban clusters but does not affect macroeconomic stability in the same way.

The fourth and deeper reason is that services competition is skill-based rather than system-based. In services, competitiveness is driven primarily by individual talent, firm culture, client relationships, and reputational capital. System quality matters at the margin, but it is not decisive. In goods manufacturing, competitiveness is inseparable from system performance, encompassing factors such as delivery times, cost discipline, standards compliance, logistics reliability, and infrastructure uptime. System failure translates directly and immediately into lost orders.

The empirical record supports this distinction. India is the strongest real-world test. India has built globally competitive service exports over three decades, yet its broader institutional environment, encompassing urban governance, courts, regulatory discretion, land and labour administration, remains weak and uneven.

There is also a more uncomfortable implication. Services exports can actively delay reform. By generating foreign exchange, increasing elite incomes, and creating pockets of prosperity, they alleviate balance-of-payments pressure and reduce the urgency for politically difficult changes. They act as a pressure valve, allowing the system to muddle through rather than confront its structural weaknesses. In theory, one could imagine a services-led disciplining path if services exports were mass-employment-intensive, geographically dispersed, heavily regulation-dependent, and if their failure created immediate macroeconomic consequences. In practice, no large economy has met these conditions. Digital services, by their nature, resist them.

The conclusion, stated precisely, is not that services exports are inferior or undesirable. They are extremely valuable for growth, foreign exchange, and firm-level excellence. The conclusion is narrower: services exports are structurally incapable of forcing system-wide state upgrading.

## Servicification of manufacturing

7.22. Beyond direct cross-border delivery, services are increasingly integrated into manufacturing through activities such as design, R&D, logistics, software development, and professional services, reflecting the growing “servicification” of production systems. This is evident in products such as smart devices, whose value is driven by

software ecosystems; medical equipment/wearables bundled with diagnostic and remote-monitoring services; and automobiles, which are increasingly described as “software on wheels”. As manufacturing becomes increasingly technology and data-intensive, services such as ICT, finance, compliance, and after-sales support account for a growing share of value creation. International experience suggests that this integration is a crucial channel for enhancing value addition, export competitiveness, and employment. (see Box VII.5).

### Box VII.5: Servicification of manufacturing - Global evidence and India’s emerging trajectory

#### Global evidence: services as a source of manufacturing value

Trade in value-added analysis<sup>15</sup> with data up to 2022 shows that services contribute a much larger share to manufacturing exports than reflected in gross trade figures—nearly one-third in advanced economies and about one-quarter in developing economies. Services account for around 30 per cent of export value in sectors such as electronics, metals, machinery, and textiles, highlighting the growing reliance of modern manufacturing on service inputs.<sup>16</sup> International firm-level evidence<sup>17</sup> further shows that manufacturers with higher service-intensity tend to be more productive and export-oriented, with value creation increasingly concentrated in pre- and post-production activities such as design, R&D, logistics, and after-sales support.<sup>18</sup>

#### Indian experience: exports and employment linkages

Firm-level studies for India<sup>19</sup> indicate that greater use of service inputs is positively associated with export participation, export intensity, and more stable or even higher employment in manufacturing. Complementing this, an analysis by the Centre for Social and Economic Progress<sup>20</sup> using OECD-TiVA and Indian input-output data shows that domestic services value added accounted for about 17.7 per cent of India’s manufacturing export value in 2020, with sectoral shares exceeding 20–25 per cent in electronics, metals, textiles and electrical equipment and 15 per cent or more in several labour-intensive industries.

15 Based on computations from the OECD Trade in Value-Added (TiVA) database (2025) using the “origin of value added in gross exports” dataset. Services shares are derived as the ratio of services value added embodied in manufacturing exports to total value added in manufacturing exports.

16 Ibid

17 S. Miroudot and C. Cadestin (2017). Services in Global Value Chains: From Inputs to Value-Creating Activities, OECD Trade Policy Papers, No.197, OECD Publishing, Paris. (<https://tinyurl.com/vwxfka2>)

18 For instance, logistics, trade finance, legal services, marketing, and distribution services reduce fixed and variable costs of exporting (customs clearance, transport, payments, contracts), making export participation viable for more firms and supporting higher export intensity. Design, engineering, testing, certification, branding, and R&D services help firms move up the value chain by improving product quality, compliance with standards, and customization—key for entering and sustaining export markets. IT, data analytics, and risk-management services enhance demand forecasting, inventory control, and supplier diversification, helping firms absorb shocks and maintain export relationships—supporting export stability.

19 Reddy, K., Sasidharan, S., & Thangavelu, S. (2023). Does servicification of manufacturing increase the GVC activities of firms? Case of India. *The World Economy*, 46(1), 153–181. (<https://doi.org/10.1111/twec.13318>)

20 Shingal, A. (2025). Servicification of Manufacturing: India’s Potential and Policy Priorities, Working Paper, Centre for Social and Economic Progress (CSEP), New Delhi, July 30, 2025. (<https://tinyurl.com/ysjnr5xh>)

### Policy-relevant considerations

Both global and Indian evidence underscore that the benefits of servicification depend on the efficiency of the services ecosystem. Improvements in logistics, transport, ICT, warehousing, and business services, along with reduced frictions in services trade, can enhance manufacturing competitiveness, export sophistication, and employment. Servicification thus highlights the complementarity between manufacturing and services, rather than the trade-offs, and offers India a pathway to raise manufacturing value addition while supporting jobs within a services-enabled growth framework.

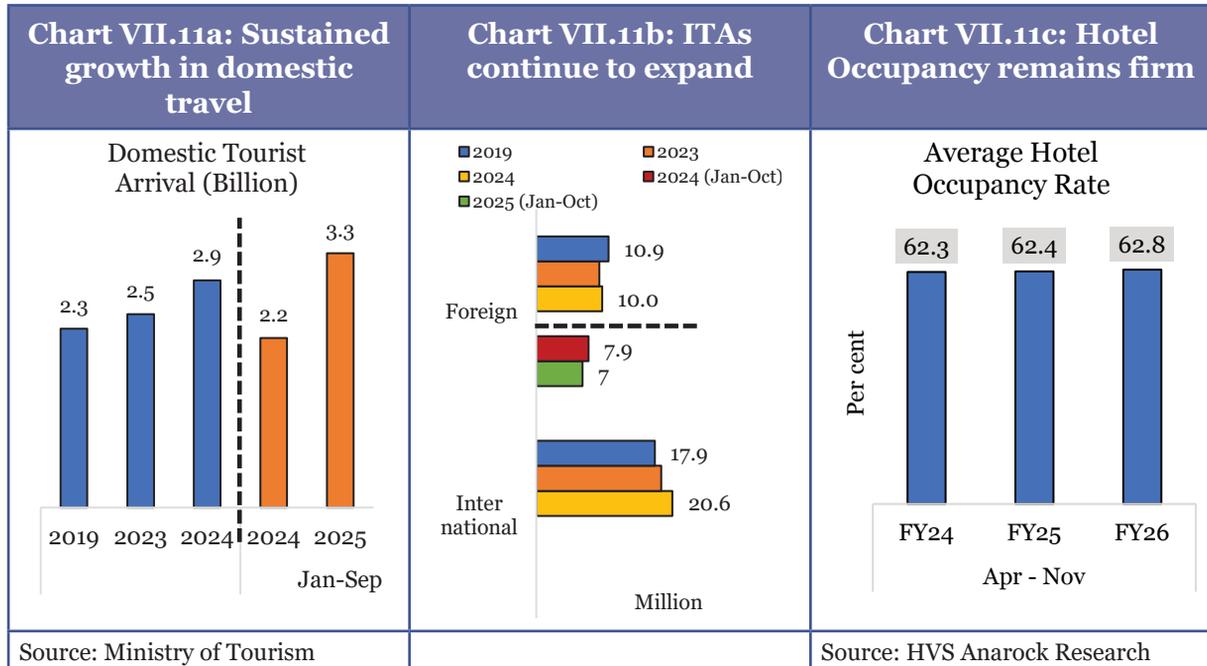
## SUB-SECTORAL PERFORMANCE AND DRIVERS

7.23. While recent trends highlight the increasing role of services in driving growth and exports, variations in demand drivers, exposure to global conditions, and the adoption of technology influence sub-sectoral performance. An examination of key services sub-sectors, therefore, provides deeper insight into the sources of growth, resilience, and emerging structural shifts within the services economy.

### a. Tourism Sector: Domestic resilience with emerging high-value segments

7.24. Domestic tourism remained the backbone of the sector, with visits increasing by about 17.5 per cent in 2024 over the previous year (Chart VII.11a) and by nearly 52.7 per cent during January-September 2025 compared with the corresponding period last year. International Tourist Arrivals (ITAs), including foreign tourist arrivals (FTAs) and arrivals of non-resident Indians (NRIs), rose to 20.57 million, marking an increase of 8.9 per cent over 2023 and 14.8 per cent above pre-pandemic levels (2019) (Chart VII.11b). Foreign tourist arrivals, however, remained below pre-pandemic levels, declining by about 11.8 per cent during January-October 2025 relative to the same period of the previous year (Chart VII.11b). This is in line with trends seen in the broader Asia-Pacific region<sup>21</sup> and is also on account of growth weakness and political turmoil in key source destinations. High-frequency hospitality indicators suggest sustained momentum, driven by domestic tourism, with hotel occupancy rates consistently exceeding 60 per cent in recent years (Chart VII.11c).

<sup>21</sup> UN World Tourism Organization. (2025, January). World tourism barometer (Vol. 23, Issue 1). UNWTO. [https://en.unwto-ap.org/news/worldtourismbarometer\\_jan2025/](https://en.unwto-ap.org/news/worldtourismbarometer_jan2025/)



7.25. As per the estimates of the Ministry of Tourism, in FY24, travel and tourism contributed 5.22 per cent to GDP, close to pre-pandemic levels, while supporting an estimated 8.46 crore direct and indirect jobs<sup>22</sup>, or about 13.3 per cent of total employment in the overall economy. Consistent with this growth, foreign exchange earnings from tourism rose to USD 35.0 billion in 2024, up 8.8 per cent from 2023.<sup>23</sup> This reflects the labour-intensive nature of this sector and its strong linkages with transport, hospitality, trade, and allied services.

7.26. Supported by cost competitiveness, skilled medical professionals, and established healthcare infrastructure, medical and wellness tourism has emerged as a key comparative advantage for India, offering high-value and non-seasonal tourism. Medical tourist arrivals increased from about 1.12 lakh in 2009<sup>24</sup> to over 6 lakh during 2022-2024, implying a CAGR of around 12.4 per cent, significantly above the overall inbound tourism growth of 4.5 per cent for the corresponding period. Consequently, medical tourism’s share in foreign tourist arrivals rose from about 2.2 per cent in 2009 to around 6.5 per cent in 2024.<sup>25</sup> Despite accounting for a modest share of total arrivals, medical tourists generate higher per-visitor spending and longer stays. Industry estimates place the medical tourism market at about USD 8.7 billion in 2025, with projections of USD 16.2 billion by 2030.<sup>26</sup>

22 Inputs received from Ministry of Tourism

23 Ministry of Tourism. <https://tinyurl.com/3awa6t63>

24 Data on medical tourism is available from 2009 onwards

25 Ministry of Tourism

26 India Medical Tourism Market Size Report (2025), Mordor Intelligence. (<https://tinyurl.com/5xb7mz5w>)

7.27. Realising tourism potential in different regions and converting it into sustained economic outcomes, however, depends critically on implementation capacity at the State and local levels. Experiences across states underscore the importance of administrative capacity and coordination across districts. Gujarat's infrastructure-led and event-based tourism initiatives illustrate the gains from coordinated planning and execution across departments,<sup>27</sup> while Kerala's state-led destination management and community participation supported an ecologically appropriate and responsible tourism model.<sup>28</sup> Sikkim's focus on sustainability and regulated visitor numbers illustrates how effective regulation and community involvement can preserve destination quality while supporting steady tourism growth.<sup>29</sup> In high-footfall cities such as Varanasi, large-scale investments in urban infrastructure through schemes like the Kashi development programme highlight the role of strengthened municipal capacity in crowd management, sanitation, and last-mile connectivity.<sup>30</sup>

7.28. In recent years, the Central Government has strengthened the tourism framework by prioritising experience-based and sustainable destination development. Schemes such as Swadesh Darshan 2.0, the Challenge-Based Destination Development initiative, and continued investments under PRASHAD have shifted the focus towards thematic, visitor-centric tourism. These efforts have been complemented by initiatives such as 'Dekho Apna Desh' and 'Incredible India', as well as improved visa facilitation and expanded regional air connectivity under UDAN, which have boosted tourism demand, particularly for lesser-known Tier 2 and Tier 3 destinations.

7.29. Sustaining and broadening this growth will require strengthening state and local capacity for event management, infrastructure upkeep, skills development, and the adoption of best practices. A tourist-centric approach-emphasising ease of travel, accommodation, local mobility, cleanliness, safety, and service quality-along with wider use of digital tools and private sector participation, will support higher-value segments. For medical tourism to thrive, targeted measures such as direct flight connectivity to key source countries, including those in Africa, and priority-based visa facilitation are also critical. Indian airports can aspire to become global aviation hubs by promoting layovers and enhancing the transit experience for international passengers. Sustained global branding and promotion in source destinations will strengthen higher tourism demand.

7.30. India also has significant untapped potential in niche tourism segments. The development of long-distance hiking trails, comparable to the Appalachian or Camino

---

<sup>27</sup> <https://tinyurl.com/4a5aw5e5>

<sup>28</sup> <https://ecotourism.forest.kerala.gov.in/>

<sup>29</sup> <https://www.nsws.gov.in/s3fs/2022-12/Sikkim%20Ecotourism%20Policy.pdf>

<sup>30</sup> <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2122058>

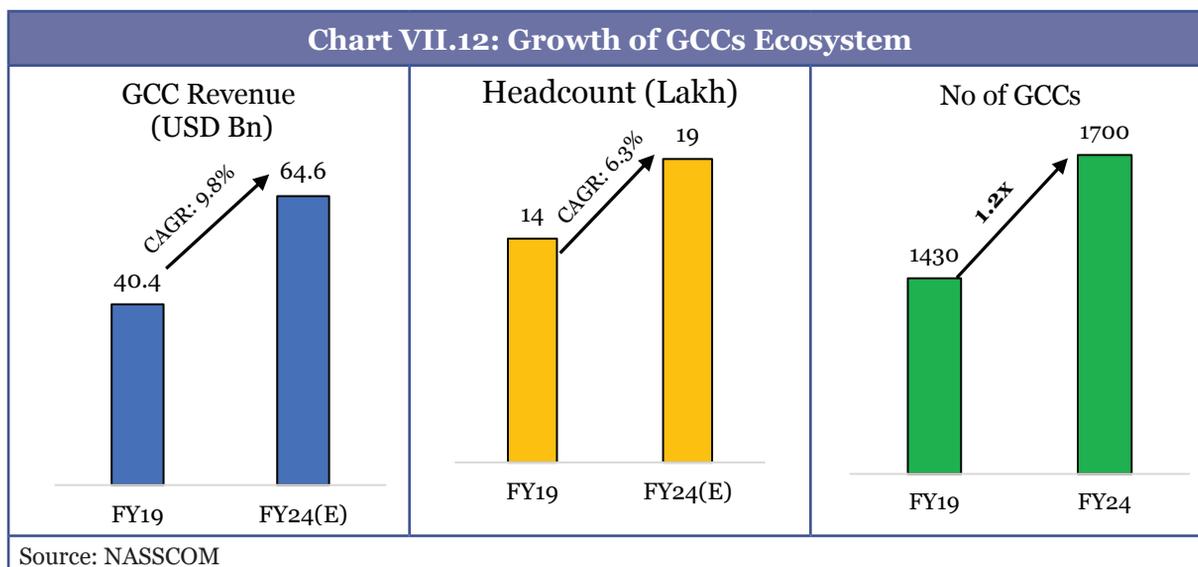
trails, can leverage India's ecological diversity, cultural heritage, and existing pilgrimage, forest and river corridors. This can support sustainable livelihoods in remote regions through community-managed, eco-friendly infrastructure, such as micro-lodges or homestays, campsites with standalone green energy sources, clean sanitation facilities, GPS-enabled navigation systems, and rescue & evacuation facilities necessary in such remote locations.

7.31. Similarly, India's vast coastline offers scope to unlock the blue economy through modern marina infrastructure. Marinas, the purpose-built harbours for recreational boats and yachts with moorings, fuel, maintenance, hospitality and water-based tourism facilities, are virtually absent in India. This constrains the growth of pleasure yachting and small-vessel building, limiting a critical first step towards the broader, mass-scale development of shipping infrastructure, a key policy focus of government. A national marina development policy that enables private players to run marinas under a transparent permit regime could support sailing, diving, and leisure cruising. This would help attract high-value tourism and international regatta events such as the Swan Cup National Regatta. Being employment-intensive, it could generate more employment in coastal regions, along with additional income for fishermen. This could also revive uneconomical ports and promote sustainable coastal development.

## **b. Information Technology and IT-Enabled Services: Adjusting to a New Global Cycle**

7.32. In FY25, the IT and IT-enabled services (IT-ITeS) sector reinforced India's position as a global technology and innovation hub, supported by continued revenue growth, a rising role of Global Capability Centres (GCCs), and deeper engagement in higher-value, complex technology activities. Nasscom estimates IT&ITeS industry revenues at USD 283 billion in FY25, (including hardware) implying a year-on-year growth of 5.1 per cent as against 3.9 per cent in FY24, underscoring resilience amid currency depreciation and subdued global tech spending. IT services exports, a key stabiliser of the external sector, are estimated to grow by 3.7 per cent in FY25.

7.33. In recent years, a key structural feature underpinning the IT-ITeS sector's performance has been the steady expansion of Global Capability Centres (GCCs) - offshore units established by multinational firms to undertake technology development, engineering, analytics and business operations for their global activities. As of FY24, India hosts over 1,700+ GCCs, employing over 19 lakh professionals, making it the largest global hub for captive centres. GCCs account for a significant share of employment within the IT sector and have contributed meaningfully to incremental hiring in recent years.

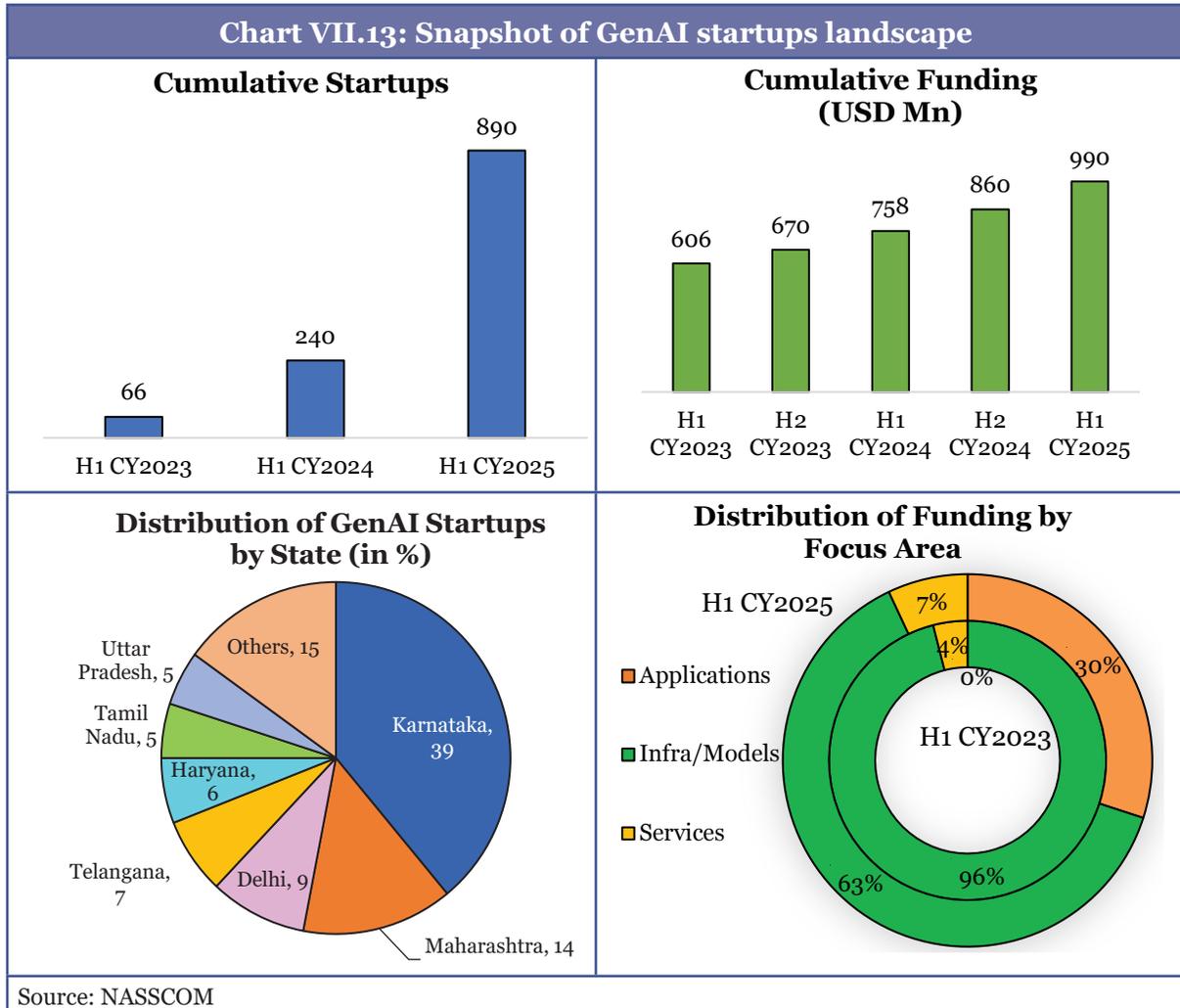


7.34. Over time, GCCs have evolved from support-oriented functions into integral components of multinational firms' global operations, undertaking core activities such as product development, engineering, analytics, cybersecurity operations and AI-enabled digital functions, thereby strengthening India's integration into global value chains as a resilient source of growth. The diversification of the GCC ecosystem has been driven by the growing participation of more specialised and innovation-focused mid-market GCCs, comprising mid-sized and emerging multinational firms. In parallel, the expansion of GCCs into Tier 2 and Tier 3 cities has supported more geographically dispersed employment and strengthened linkages with local innovation and startup ecosystems.

7.35. Driven by surging data consumption, rapid cloud adoption, and the growing use of AI, India's data centre capacity is projected to reach about 8 GW by 2030 from about 1.4GW as of Q2 of 2025.<sup>31</sup> AI data centres are specialised high-performance facilities designed to meet the intensive computational needs of artificial intelligence, machine learning, and deep learning workloads. Despite generating nearly 20 per cent of the world's data, India hosts only about 3 per cent of global data centres, around 150 out of 11,000 worldwide, according to Nasscom, highlighting both a large growth opportunity and a competitiveness gap. Data centres are also double-edged swords as they are very energy-intensive. With emerging hubs such as Malaysia (Johor), Japan, and Vietnam intensifying competition, addressing structural constraints such as energy shortages will be critical for India to position itself as a global AI data centre hub.

<sup>31</sup> Source: S&P (<https://tinyurl.com/4a5rzwe4>); Data centers are commonly measured by gigawatts (GW), as power consumption has become the primary metric for defining their capacity and scale, especially with the rise of AI and high-performance computing.

7.36. Another key trend in the IT-ITeS sector is a shift towards higher-value products and capability-driven growth. According to Nasscom, Deep Tech companies experienced a 78 per cent rise in funding in CY2024. India’s technology startup ecosystem, the world’s third largest, now comprises about 32,000-35,000 startups, with over 2,000 added in CY25, including over 900 funded start-ups in CY25. Within this, the Generative AI segment has expanded rapidly, with active GenAI startups rising more than threefold from about 240 in H1 CY2024 to over 890 by H1 CY2025.



7.37. Rising digitalisation, cloud adoption, and data-intensive technologies have also increased the demand for cybersecurity, including threat detection, risk management, compliance, and managed security services. India’s cybersecurity market is estimated at about USD 6.0 billion in 2023, growing at about 30 percent, according to Nasscom-DSCI. India’s strengthening capabilities are also evident in its Tier-1 ranking on the International Telecommunication Union’s Global Cybersecurity Index in 2024, with a score of 98.49, placing it among the world’s most cyber-resilient countries.

7.38. A structural shift, rather than a cyclical disruption, is evident in global demand for productivity-enhancing solutions driven by Generative AI, cloud adoption, cybersecurity, and data engineering. While India has improved its ranking in UNCTAD's Frontier Technology Readiness Index, from 48th in 2022 to 36th in the latest assessment (2024) among 170 economies, weaker outcomes in ICT penetration and skills, as reflected in the same index, point to constraints in the wider diffusion of frontier technologies across firms and regions. As the IT-ITeS sector creates new opportunities for productivity gains and movement up the value chain, it is at an inflexion point, with the key challenge lying in timely reskilling and the adaptation of firms and the workforce to evolving business models.

7.39. For India, Singapore's model offers valuable lessons. Since the early 2000s, Singapore has implemented successive multi-year Research, Innovation and Enterprise (RIE) plans to align public R&D investment, industry participation and talent development with evolving economic priorities.<sup>32</sup> Key features of Singapore's R&D framework include focused investment in select domains (such as advanced manufacturing, digital technologies, biomedical sciences, and sustainability); strong industry-research linkages through co-funded programmes and collaborative platforms; centralised governance to avoid a fragmented approach; predictable multi-year funding to enable long-horizon and high-risk innovation investments; and a talent-centric approach to augment the supply of high-skilled researchers and workforce. This approach has delivered measurable outcomes: gross R&D expenditure rose from about US\$7.1 billion in 2012 to US\$12.7 billion in 2022, around 65 per cent of which is business-led, alongside a sharp rise in patenting from about 1,722 in 2012 to over 4,107 by 2022<sup>33</sup> and consistently strong innovation rankings. India's ongoing initiatives-such as the ANRF & RDI Scheme, mission-based programmes in semiconductors, clean energy, and biotechnology, and PLI schemes-already signal a shift towards mission-driven, industry-linked R&D with the aim of concentrating resources in priority domains.

7.40. Looking ahead, the IT-ITeS sector is well-positioned to play a larger role in India's medium-term growth and productivity. Realising this potential will require strengthening the foundations for innovation-led, capability-intensive growth through a skilled and adaptable workforce, wider diffusion of digital technologies, and a policy environment that supports innovation and scaling. Some interventions can be relatively straightforward, for instance, recognising data centres and cloud service providers as a distinct category, rather than classifying them as "commercial buildings" under

<sup>32</sup> National Research Foundation, Singapore, Research, Innovation and Enterprise (RIE) 2025 Plan. <https://file.go.gov.sg/rie-2025-handbook.pdf>

<sup>33</sup> National Research Foundation & Agency for Science, Technology and Research (A\*STAR). (2023). 2022 RIE Survey Publication: Research and Innovation Expenditure in Singapore. Singapore: Government of Singapore. (<https://tinyurl.com/sp77v5wd>)

the National Building Code, 2016, which does not account for their specialised design needs. Additional measures could include releasing more anonymised public data to leverage scalable cloud-based Digital Public Infrastructure while maintaining robust security standards; facilitating visas for key professionals; providing tax clarity for data hosted by foreign entities in India; enabling energy-intensive data centres to access renewable power; and establishing centres of excellence within corporate hubs to strengthen research partnerships with academia.

### **c. Transport Services: Strengthening connectivity and logistics performance**

7.41. Transport services directly contribute around 4.5 per cent to GVA<sup>34</sup>, and form a foundational component enabling services for a wide range of economic activities, including manufacturing, trade, and mobility across the economy. The sub-sector has strengthened in recent years, supported by the Government's sustained emphasis on infrastructure development.

#### **Cargo transport services at ports**

7.42. Port capacity has expanded in recent years through modernisation, digitisation, and greater private participation. As a result, cargo handled at Indian ports<sup>35</sup> increased from about 1052 million tonnes in FY15 to around 1603 million tonnes in FY25. This momentum continued into FY26, with port cargo traffic at major ports recording an 8.2 per cent growth during April-December, reflecting strengthening trade activity (Table VII.1). Alongside higher volumes, operational efficiency has also improved, with the average turnaround time of container vessels at major ports declining from approximately 43 hours in FY15 to nearly 30 hours in FY25.<sup>36</sup> Complementing port-led gains, cargo movement on national waterways increased from approximately 18.1 million tonnes in FY14 to over 145.5 million tonnes in FY25, reflecting improved integration between ports and inland waterways.

#### **Aviation Services for Passenger and Cargo Transport**

7.43. Aviation services have continued to play a key role in sustaining passenger mobility and air cargo flows. In FY25, overall air passenger traffic increased by 9.4 per cent, reaching 411.8 million passengers, driven by broad-based demand from both domestic and international travellers (Table VII.1). However, a softening of momentum was observed during April-November 2025, when overall passenger traffic increased by 3.5 per cent (YoY), reflecting flight disruptions and short-term demand adjustments

<sup>34</sup> Source: Statement 8.10: Output & Value Added from Transport Services, NAS, MOSPI

<sup>35</sup> Including major and non-major ports

<sup>36</sup> Inputs received from Ministry of Ports, Shipping & Waterways

in the domestic passenger segment. During this period, domestic passenger traffic moderated to 2.6 per cent, while international passenger traffic recorded a relatively strong growth of 7.3 per cent, despite subdued foreign tourist arrivals.

7.44. Similar trends were observed in the air cargo segment. After recording a robust growth of 10.5 per cent in FY25, supported by steady trade flows, air cargo growth moderated to about 5.0 per cent during April-November 2025. Industry assessments suggest that this moderation reflects a combination of factors, including higher operating costs, capacity constraints, geopolitical uncertainties affecting international routes, and a normalisation of demand after strong growth in the previous year.

**Table VII.1: Performance of Transport Indicators**

	Units	FY16- FY20*	FY24	FY25	FY16-FY20*: Apr-Dec	FY25 : Apr-Dec	FY26: Apr-Dec
Port Cargo Traffic <sup>^</sup>	Mt	667.6	819.2	854.8	494.2	621.9	672.9
YoY Growth	%	3.9	4.5	4.3	3.9	2.7	8.2
Air Cargo Traffic <sup>#</sup>	Mt	3.2	3.4	3.7	2.0	2.5	2.6
YoY Growth	%	5.9	7.0	10.5	6.3	14.3	5.1
Air Passenger Handled <sup>#</sup>	Mn	296.7	376.4	411.8	194.0	266.1	275.5
YoY Growth	%	12.6	15.0	9.4	13.6	8.5	3.5
Railway Freight	Mt	1159.2	1588.0	1614.9	850.8	1176.1	1215.0
YoY Growth	%	2.0	5.2	1.7	2.0	2.1	3.3

Source: AAI, IPA, Ministry of Railways, MoSPI  
Note: \*FY16-FY20 corresponds to average value/ growth in pre-covid period.  
<sup>^</sup> Port cargo traffic at major ports  
Mn stands for million, Mt stands for Million tonnes  
<sup>#</sup>Data up to November  
The data of Railway Freight is Excluding KRCL

## Railway freight services

7.45. Rail freight services, a 50 per cent cost-effective cargo route compared to road transport, continue to play a critical role in supporting the bulk and long-distance movement of goods essential for core industrial activity.<sup>37</sup> In FY25, freight loading by Indian Railways exceeded 1.6 billion tonnes, witnessing a slight expansion over FY24. However, it remains 12.5 per cent higher than the average of FY21-FY24, signalling a healthy underlying momentum. This momentum has been sustained into FY26, with freight loading growing by 3.3 per cent and reaching about 1,215 million tonnes (MT)

<sup>37</sup> <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2214076&utm>

during April-December (Table VII.1). Growth was supported by strong demand from core sectors such as coal (601 MT), iron ore (138 MT), cement (109 MT), container traffic (71 MT), pig iron and finished steel (56 MT), fertilisers (52 MT), mineral oil (38 MT), foodgrains (36 MT), raw materials for steel plants (approximately 23 MT), and other goods (91 MT).

7.46. Railways' operational efficiency has also improved, with average daily freight loading rising from 4.2 million tonnes in 2024 to about 4.4 million tonnes in 2025. This has been supported by capacity augmentation through the commissioning of new tracks and the expansion of Dedicated Freight Corridors, which have eased congestion and increased movement speeds. Policy measures, including bulk cement terminals, rationalised freight rates for containerised cement movement, and wider adoption of digital platforms such as the Freight Operation Information System, have further strengthened bulk handling and operational efficiency.

#### **d. Telecommunication: Expanding Connectivity and Digital Capabilities**

7.47. Telecommunications services, which contribute directly to about 1.2 per cent of India's GVA, form a foundational backbone of the digital economy, supporting productivity and service delivery across sectors through improved access, affordability, and usage. Telecom connectivity has expanded steadily over the past decade. Total telephone connections rose from about 933 million in 2014 to over 1.2 billion by November 2025, with tele-density increasing from 75 per cent to 86.8 per cent, driven largely by faster growth in rural areas, indicating improved digital inclusion. Internet subscriptions expanded sharply from about 25 crore to 101.8 crore by September 2025, alongside rising broadband penetration.<sup>38</sup> Affordability improvements are reflected in average monthly data consumption per subscriber, which increased from 62 MB in 2014 to about 25 GB by mid-2025. This was supported by a steep decline in data prices -from around ₹300 per GB in 2014 to ₹8.3 per GB in 2025<sup>39</sup>, along with steady improvements in digital and communication infrastructure.

7.48. This expansion in connectivity has been underpinned by steady improvements in India's digital and communication infrastructure, combining public R&D with programme-based deployment. India has developed end-to-end indigenous 4G and 5G (NSA) core network technologies, placing it among a small group of countries with domestic telecom capabilities, while national programmes have expanded network reach and capacity. Alongside this, advances in cyber and telecom security have strengthened network reliability, improved disaster-resilient communications,

<sup>38</sup> Inputs received from the Department of Telecommunication

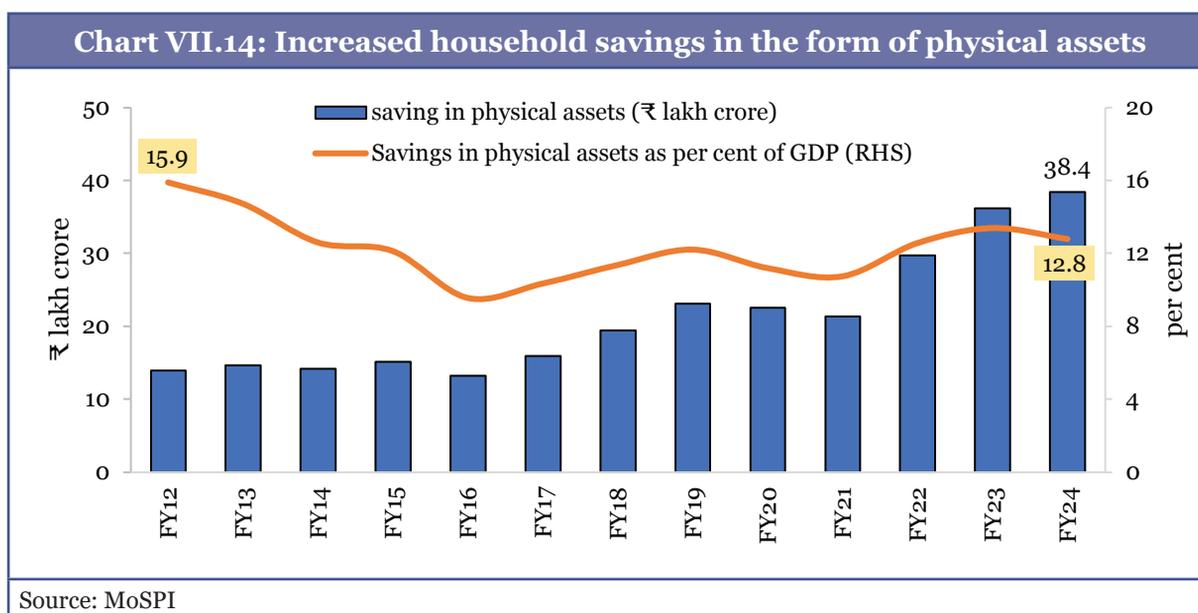
<sup>39</sup> <https://www.pib.gov.in/PressReleaseDetailm.aspx?PRID=1864152>

and supported progress in next-generation secure technologies, including quantum-secured communication.

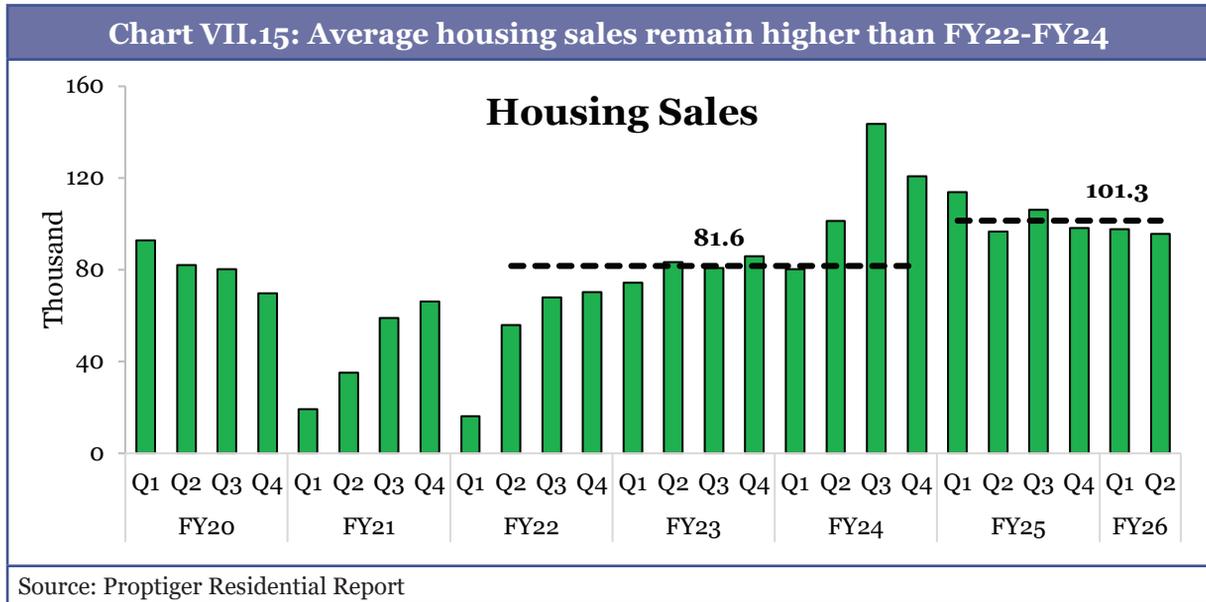
### e. Real estate and housing services

7.49. The ‘real estate and ownership of dwellings’ sector has contributed about 7 per cent to annual GVA, on average, over the past decade, highlighting its importance in services-led growth and strong linkages with construction and financial services. Over this period, policy reforms, including the implementation of the Real Estate (Regulation and Development) Act (RERA), GST, and the Housing for All mission, have supported greater formalisation of the sector. Demand-side measures, such as interest subvention under PMAY (Urban), the Affordable Housing Fund, lower interest rates, and streamlined credit processes, have further strengthened access to housing finance. Urban initiatives, such as the Smart Cities Mission and the Urban Infrastructure Development Fund (UIDF), have supported housing demand in Tier 2 and Tier 3 cities.

7.50. Backed by these reforms, the sector entered a sustained upcycle from September 2021, post-COVID, as reflected in improved sales, driven by higher household savings channelled towards physical assets (Chart VII.14). The momentum has continued in recent quarters, supported by favourable affordability conditions and easing inflation. On average, housing volume sales continue to remain higher compared to FY22-FY24 (Chart VII.15). Housing finance also expanded steadily, with outstanding individual housing loans more than tripling from about ₹10 lakh crore as at the end of March 2015 to over ₹37 lakh crore at end March 2025<sup>40</sup>, raising housing loans from 8.0 per cent to over 11 per cent of GDP, indicating a deeper financialisation of housing demand.



<sup>40</sup> NHB; individual housing loan outstanding of Scheduled Commercial Banks and Housing Finance Companies



## f. Media and entertainment services

7.51. The media and entertainment (M&E) sector has become a significant component of India’s services economy, spanning audio-visual production, broadcasting, digital content, animation and gaming, advertising, and live entertainment. Over the past decade, it has undergone a structural shift towards digital and platform-based delivery, reshaping revenue models, value chains and employment. Industry estimates place the sector’s size at around ₹2.5 trillion in 2024<sup>41</sup>, driven by rising incomes, rapid internet penetration and a large domestic market. Digital media emerged as the primary growth engine, contributing approximately one-third of the sector's total revenues, while also driving demand for content production, post-production, Visual Effects (VFX), dubbing, and localisation, all integrated into global distribution networks.

7.52. Segment-wise, audio-visual and film services remain central, with India among the world’s largest content producers, and revenues are increasingly driven by digital distribution. Video subscription revenues are estimated at ₹9,200 crore in 2024. Broadcasting and advertising have shifted decisively from linear TV to OTT and mobile platforms, with digital advertising growing faster than traditional formats. High-growth, export-oriented segments, such as animation and VFX, reached a revenue size of approximately ₹103 billion in 2024, supported by skilled manpower and cost competitiveness. The gaming segment, driven largely by mobile platforms and digital payments, expanded rapidly, with industry revenues estimated at around ₹232 billion in 2024, supported by a large and growing user base, even as monetisation models continue to evolve. Live entertainment also rebounded strongly post-pandemic (See

<sup>41</sup> The numbers quoted in this section come from the Federation of Indian Chambers of Commerce and Industry (FICCI) & EY (2025). Shape the future: Indian media and entertainment is scripting a new story. (<https://tinyurl.com/jevrrj5b7>)

Box VII.6 on the Orange Economy), crossing ₹100 billion in 2024 and generating spillovers to tourism and urban services. Overall, medium-term prospects remain strong, bolstered by digital adoption, content diversification, experiential consumption, expanding connectivity, and technological advances in AI, immersive media and virtual production.

### Box VII.6: The Orange Economy - An Emerging Lever for Media, Tourism and Urban Services

The “Orange Economy” refers to the part of the economy driven by creativity, culture, and intellectual property, comprising activities where value comes primarily from ideas, knowledge, artistic expression, and cultural content, rather than from physical goods. Of this, the concert economy comprises large-scale live music and entertainment events, along with their associated value chains, including ticketing, hospitality, travel, logistics, media production, advertising, and local services, extending beyond physical attendance. International evidence shows that live concerts are high-multiplier, services-intensive activities, generating economic value well beyond ticket sales by supporting tourism, employment and urban services. Globally, live music accounts for about one-third of total music revenues; in the US, it generated over USD 130 billion and supported more than 900,000 jobs in 2019.<sup>42</sup> In the UK, music tourism alone contributed £6.6 billion (USD 8.1 billion) in 2022 (about 0.3 per cent of GDP), reflecting strong spillovers to hospitality, transport and retail.<sup>43</sup> Concerts also serve as short-duration tourism demand amplifiers, being labour-intensive and creating jobs across various sectors, including event operations, logistics, hospitality, security, and media, particularly for young people and creative professionals. According to UNCTAD estimates<sup>44</sup>, the creative industries contribute between 0.5 per cent and over 7 per cent of GDP across countries, underscoring the significant potential of live entertainment.

In India, the concert economy is nascent but scaling, supported by a young population, rising incomes, digital ticketing platforms and improving urban infrastructure. International experience underscores that economic gains depend on urban readiness and facilitative governance, including streamlined permissions, predictable regulations, efficient crowd management, last-mile connectivity and coordination across city authorities and tourism bodies. In India, there is a lack of live event venues and restrictions on the foreign payments that can be made to artists coming from abroad. Opening up heritage monuments for such events and facilitating the visa and foreign exchange permissions for the foreign performers/artists could be considered in this regard. Considering that anywhere between 10 and 15 clearances are required, the Ministry of I&B is working on a Single Window Mechanism for Live Entertainment Permissions,<sup>45</sup> including those needed from state governments. With

42 Oxford Economics. (2021). The Concerts and Live Entertainment Industry: A Significant Economic Engine (Report No. 357150). Oxford Economics. (<https://tinyurl.com/4d783h4z>)

43 UK Music. (2023). Here, There and Everywhere 2023: Music Tourism and Economic Contribution.

44 UNCTAD’s Creative Economy Outlook 2024

45 Ministry of Information & Broadcasting, Government of India. (2025). India’s live events economy: A strategic growth imperative (White paper). Government of India. (<https://tinyurl.com/47xkpn2w>)

appropriate facilitation and integration into tourism and city branding strategies, the concert economy can become a meaningful driver of growth for M&E, tourism and allied services.

### **g. Commercialising Space and Ocean Services**

7.53. India's space sector has emerged as a fast-growing, technology-intensive and increasingly commercial segment of the services economy. Valued at about USD 8.4 billion (around 2 per cent of the global space market), it is projected to expand to USD 44 billion over the next decade<sup>46</sup>, driven by launch services, satellite communications, earth observation, navigation and a rapidly growing private ecosystem. Commercial launches have been a key export source, with India launching 393 foreign satellites for 34 countries between 2015 and 2024. This effort has earned nearly USD 143 million and EUR 272 million<sup>47</sup>, reflecting its cost-effective and reliable capabilities amid rising global demand for small satellites.

7.54. Commercialisation has been strengthened through NewSpace India Limited (NSIL)<sup>48</sup>, whose revenues rose from ₹322 crore in FY20 to ₹2,940 crore in FY23, with further expansion projected in FY25 to ₹3246.1 crore.<sup>49</sup> Profitability has also improved steadily, driven by demand-driven missions, satellite capacity leasing, and end-to-end commercial project execution, including dedicated launch services and the deployment of communication satellites. Satellite-enabled services are expanding rapidly, with India's satellite data services market valued at USD 495 million in 2024<sup>50</sup>, driven by applications in defence, climate services, logistics and urban planning. At the same time, India's private "NewSpace" ecosystem has scaled across manufacturing, launch vehicles, data analytics and downstream services, attracting over ₹1,000 crore in private funding in FY23.<sup>51</sup> Commercial leasing of transponder capacity, global sale of Earth observation imagery, and growing adoption of NavIC<sup>52</sup> in navigation and mobility services are expanding downstream service revenues. Policy initiatives such as the Indian Space Policy (2023), the operationalisation of IN-SPACE, and liberalised FDI norms have lowered entry barriers and enabled a transition towards a mixed public-private services model. This has enabled the space sector to evolve into a high-value, export-oriented and innovation-driven services segment.

46 <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2068155>

47 <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2110830&reg=3&lang=2>

48 which serves as the central commercial interface for launch services, satellite operations and technology transfer

49 <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2115229>

50 Grand View Research. (2025). India Satellite Data Services Market Size & Outlook, 2030. (<https://tinyurl.com/7pz8kn4f>)

51 <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1985938>

52 Navigation with Indian Constellation

7.55. Just as space, ocean technology and ocean sciences can be scaled through public-private partnerships. Developing heterogeneous Earth-system data products and services across the atmosphere, oceans, cryosphere and geosphere can fundamentally transform the economics of Earth-system science and applications.

## CONCLUSION AND WAY FORWARD

7.56. The trajectory of India's services sector over the past year underscores its significance to the nation's economic growth, resilience, and structural transformation. Amidst global volatility and shifting geopolitical alignments, the sector has not only maintained robust momentum in output, employment, and exports but has also demonstrated adaptability through diversification into high-value, technology-driven, and experience-led segments.

7.57. This performance has been underpinned by a series of far-reaching reform measures and policy initiatives that have systematically addressed legacy bottlenecks and positioned the sector for sustained, inclusive growth. Improvements in digital and physical infrastructure, connectivity, logistics and urban services have broadened the domestic base of services-led activity. The expansion of digitally delivered, knowledge-intensive and experience-based services has strengthened India's underlying comparative advantages. The government's proactive approach to trade policy, evident in the negotiation of comprehensive free trade agreements and economic partnerships, has facilitated greater market access, professional mobility, and regulatory cooperation, thereby enhancing the global competitiveness of Indian services. In parallel, targeted interventions in skill development, urban infrastructure, and innovation ecosystems have sought to bridge regional and sectoral disparities, foster entrepreneurship, and align workforce capabilities with evolving market needs.

7.58. While technologies are enhancing productivity and enabling new service models, the pace of change is outpacing workforce and firm-level adaptation. As a result, many economies face widening skills gaps, with rising demand for specialised capabilities in areas such as data analytics, cybersecurity, cloud computing, and AI, alongside greater automation of routine service tasks. Tighter immigration regimes in several advanced economies and intensifying global competition for skilled talent are further influencing the cross-border delivery of services. Against this global backdrop, going forward, sustaining India's position in the global services market will depend on productivity gains, continued innovation, ongoing investment in skills aligned with emerging technologies, and further simplification of regulatory processes. How effectively the sector responds to these factors will shape its contribution to India's growth trajectory in the years ahead.

7.59. The chapter also highlights key areas for improvement across major services segments. For IT and IT-enabled services, the sector's future hinges on timely reskilling, the wider diffusion of digital technologies, and the creation of a supportive policy environment for innovation and scaling. Key reforms include recognising the unique requirements of data centres, such as access to green energy, facilitating visas for skilled professionals, providing tax clarity for digital services, and the need to promote mission-driven, industry-linked research, as well as predictable funding and strong public-private collaboration. Tourism requires the creation of niche segments, such as long-distance hiking trails, and a national marina development policy to unlock the blue economy. Streamlining permissions for live events, opening up heritage venues, and facilitating foreign artist participation will help realise the potential of the concert and orange economies. Space and ocean services are poised for rapid expansion through commercialisation and public-private partnerships. Collectively, these efforts can enable the services sector to remain competitive, employment-intensive and resilient, while supporting sustained and inclusive economic growth.

\*\*\*

*This page has been left blank*

# INDUSTRY'S NEXT LEAP: STRUCTURAL TRANSFORMATION AND GLOBAL INTEGRATION



*The industrial sector in FY 2025-26 continued to display resilience and further regained momentum despite persistent global headwinds. This momentum is underpinned partly by the shift towards high-technology manufacturing. This transition reflects global trends wherein competitiveness hinges less on cost arbitrage and more on strategic indispensability within Global Value Chains (GVCs). India's long-term success will depend on its ability to integrate into GVCs as a high-tech, high-productivity manufacturing hub supported by stable and innovation-friendly policies.*

*Flagship policy initiatives of the Government are anchoring this transformation. The Production Linked Incentive (PLI) scheme continues to attract substantial investments and drive domestic value addition, particularly in electronics and emerging technology segments. Complementing this, the National Manufacturing Mission sets a long-term blueprint to boost the manufacturing sector substantially. A critical focus is on transitioning India from a technology adopter to a global innovator and scaling up the MSMEs for global competitiveness. The innovation ecosystem is being strengthened through the establishment of the Anusandhan National Research Foundation (ANRF) and the Research, Development & Innovation (RDI) Fund, which aim to crowd-in private R&D and accelerate leadership in strategic sectors such as semiconductors. Parallely, a strong thrust on infrastructure and logistics efficiency—through initiatives like PM GatiShakti and National Industrial Corridor Development Programme—is contributing towards enhancing cost competitiveness.*

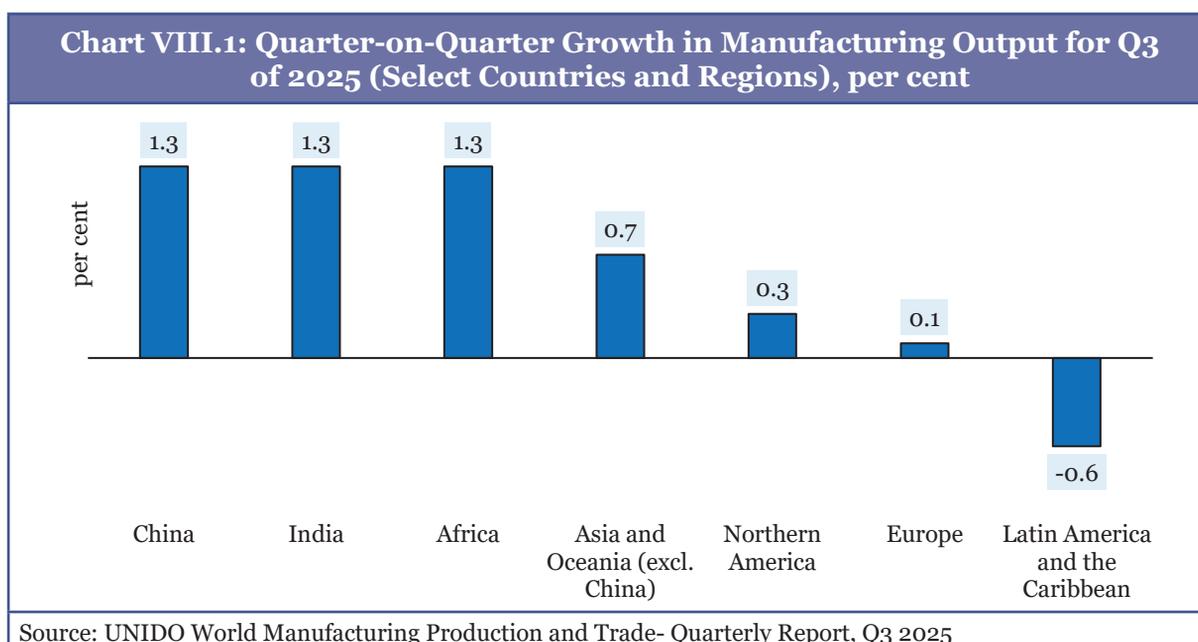
*The path to Viksit Bharat @2047 requires strategic resilience and continuous ascent within the GVCs. Sustained reforms across five pillars- Ease of Doing Business, R&D and innovation, Skilling, Infrastructure & Logistics, and Scaling up of MSMEs- will remain critical in positioning industry as a key engine of future growth.*

## **GLOBAL MANUFACTURING: UNEVEN RECOVERY AND THE SHIFT TOWARDS HIGH-TECH VALUE CHAINS**

8.1. Globally, the industrial sector in 2025 continued to face macroeconomic challenges stemming from evolving geopolitics, inflationary pressures and supply

chain realignments among other factors. Despite a steady first half, the global outlook remains subdued, with risks tilted to the downside.<sup>1</sup>

8.2. Though the world manufacturing output as a whole, expanded by 0.7 per cent in Q3 of 2025 (calendar year), the performance across regions remained uneven. Africa led manufacturing growth in Q3 2025, followed by Asia and Oceania. While Latin America and the Caribbean witnessed a decline, the Europe experienced stagnation.<sup>2</sup> India maintained strong industrial growth during the same period, placing it among the fastest growing industrial performers globally.



8.3. Global manufacturing continues to shift towards higher-value, innovation-intensive activities. Medium- and high-technology industries expanded by 1.7 per cent and 1.4 per cent in Q2 and Q3 of 2025 respectively, significantly outpacing stagnant low-tech segments.<sup>3</sup> The UNCTAD World Investment Report 2025<sup>4</sup> notes, ‘*investment in the digital economy and technology continues to act as a growth engine.*’

8.4. Alongside this technological shift, countries are also recalibrating their industrial strategies to reduce vulnerability to external disruption and enhance their leverage within global production networks by securing reliable positions in key areas of the global value chain.

1 International Monetary Fund’s World Economic Outlook for October 2025.

2 UNIDO World Manufacturing Production and Trade: Q3 2025 Report available at <https://tinyurl.com/wde6xrsx>.

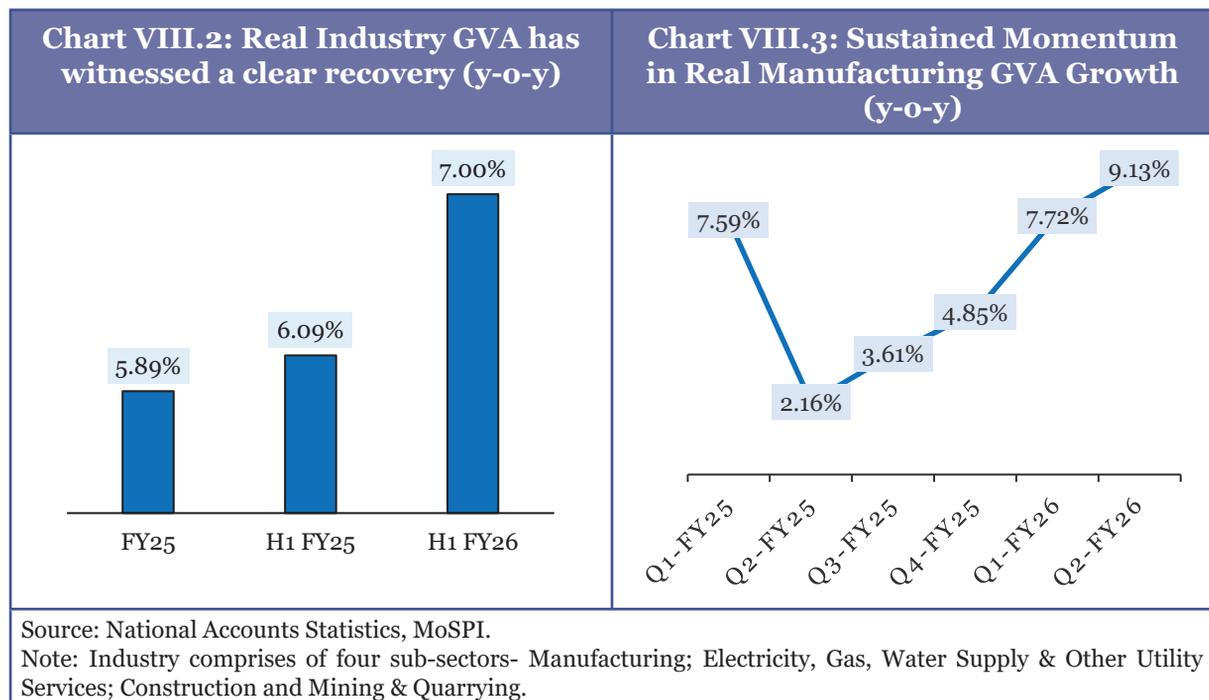
3 Ibid.

4 <https://tinyurl.com/5x52442e>.

8.5. Collectively, these trends suggest that the next phase of global manufacturing will be shaped less by simple cost arbitrage and more by strategic indispensability. Future success will depend on a country's preparedness and capacity to embed itself into GVCs as a high-tech, highly productive manufacturing hub supported by a stable policy environment.

## DOMESTIC DEVELOPMENTS: RESILIENCE AND STRUCTURAL TRANSFORMATION

8.6. Against this backdrop, India's industrial performance remains robust. Industry Gross Value Added (GVA) grew by 7.0 per cent year-on-year, in real terms, in the first half of FY2025-26, marking a clear pickup after growth had eased to 5.9 per cent in the previous fiscal year (FY2024-25).



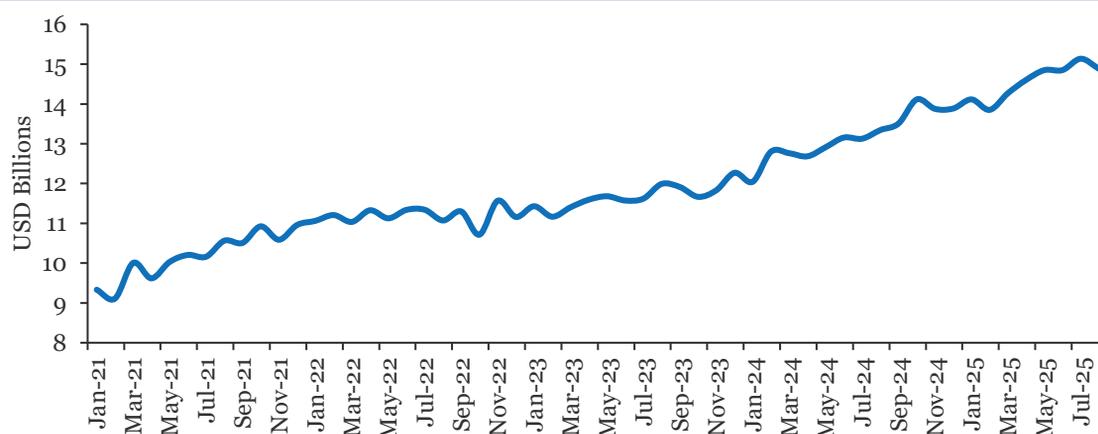
8.7. Worldwide, manufacturing activity softened across major economies through 2024 and early 2025, with some advanced economies even experiencing stagnation. This global deceleration dampened trade, investment, and order books everywhere, creating spillovers that inevitably impacted the Indian economy. Consequently, the easing in FY25 reflected a broader cooling of global demand rather than a weakening of India's underlying industrial capabilities.

8.8. This is further reinforced by the recovery witnessed in FY 2025-26, as Manufacturing GVA grew by 7.72 per cent and 9.13 per cent in Q1 and Q2, respectively, primarily driven by ongoing structural shifts within the sector. These include a gradual

move toward higher-value manufacturing segments, improved availability of industrial infrastructure through corridor-led development, and greater adoption of technology and formalisation across firms. This reflects India's improved industrial capability.

8.9. Medium and high-technology activities now account for 46.3 per cent of India's total manufacturing value added.<sup>5</sup> This positions India among a relatively small group of middle-income industrialising economies that are steadily moving towards sophisticated production structures. This shift is due to various government initiatives such as the Production Linked Incentive (PLI) schemes and the India Semiconductor Mission, alongside the strengthening of domestic capacities in electronics, pharmaceuticals, chemicals and transportation sectors. Consequently, India's global standing has strengthened, as its ranking in terms of Competitive Industrial Performance (CIP) improved to 37<sup>th</sup> in 2023, up from 40<sup>th</sup> position in 2022.

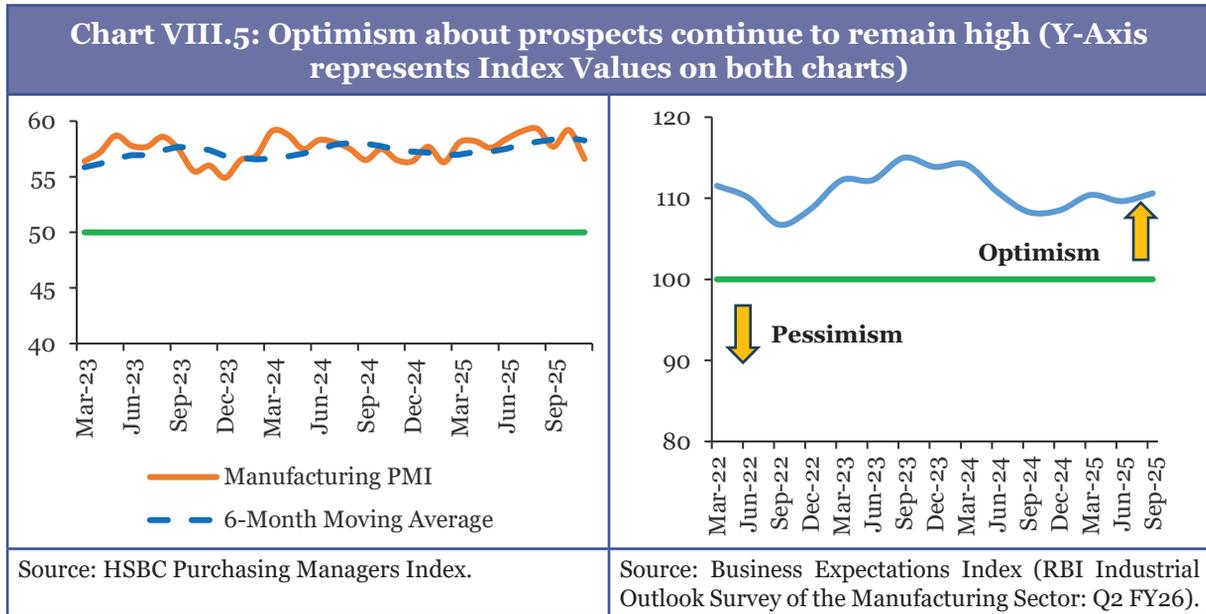
**Chart VIII.4: India's Seasonally Adjusted Global Exports of Medium- and High-Tech Manufactured Products (USD Billions)**



Source: UNIDO Statistics.

8.10. Forward-looking indicators continue to signal optimism within India's industrial sector. The Manufacturing Purchasing Managers' Index (PMI) has remained well above the expansion threshold of 50 between March 2023 and the present, with both the headline index and its six-month moving average fluctuating comfortably in the mid-50s to high-50s range (Chart VIII.5). This stability suggests broad-based confidence in current operating conditions, order books, and production plans. A similar trend is also seen in the RBI's Business Expectations Index, which has consistently stayed above the neutral benchmark of 100 through FY25 and into Q2 FY26, signaling positive sentiment regarding future output, employment, and investment. Together, these indicators reinforce the continued resilience of industry sentiment and reflect a business environment where firms remain confident about demand and growth prospects.

<sup>5</sup> UNIDO World Manufacturing Production: Q2 2025 Report.



8.11. Overall, India’s industrial sector continues to emerge as a key contributor of resilience and growth amidst the challenging global industrial landscape. Even as the global industrial production grows slowly, India’s consistent expansion, growing technological depth, and rising global presence underline its potential to remain a bright spot in the world economy.

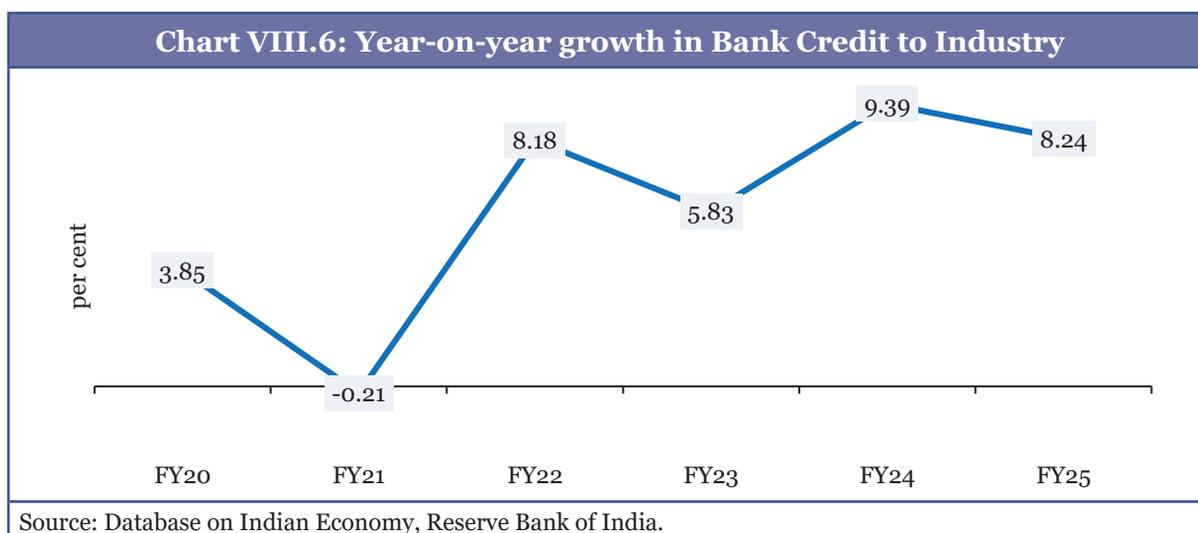
8.12. Given the sector's strategic vitality, significant employment potential, and deep economic linkages, a more concerted focus is required on five structural pillars of competitiveness: strengthening the regulatory environment for ease of doing business; boosting innovation and R&D; addressing skill gaps for future workforce needs; enhancing infrastructure and logistics to lower costs; and scaling up the MSME sector for global competition.

### Industrial credit

8.13. Though bank-based industrial credit growth from commercial banks moderated to 8.24 per cent in FY25 compared with 9.39 per cent in FY24, assessments indicate an ongoing diversification of funding sources away from banks. The Monthly Economic Review of August 2025 noted, ‘decrease in bank credit coincides with the increase in the overall flow of financial resources to the commercial sector. This shift could be due to the large corporations increasingly relying on market-based instruments such as commercial paper and corporate bonds for their funding requirements’.<sup>6</sup> Financial flows from non-bank sources to the commercial sector recorded a CAGR of 17.32 per cent over the period FY20 to FY25. Furthermore, the total flow of financial resources from domestic sources to the commercial sector has demonstrated remarkable resilience,

<sup>6</sup> <https://tinyurl.com/yd2kafsy>.

growing at a CAGR of 28.6 per cent since FY20.<sup>7</sup> These trends highlight how effectively the financial resources are growing from non-bank sources, offsetting the moderation in credit from bank sources.<sup>8</sup>



8.14. Against this backdrop, the moderation in bank credit flow to industry—though still growing at a rate above 8 per cent in FY25—should be seen as a sign of an ongoing structural adjustment. Diversification of finance sourcing by industries is expected to improve stability, reduce cyclical dependence on bank credit, and align funding more closely with firms’ balance sheet strength. The growing depth of the corporate bond markets and non-bank financing channels is expected to create an industrial credit landscape supportive of higher investment with lower systemic risk.

**Table VIII.1: Industry-wise growth in deployment of gross bank credit (in per cent)**

Sector	CAGR FY21-FY24	FY25 Growth (y-o-y)
Mining and Quarrying (incl. Coal)	7.62%	4.79%
Food Processing	10.09%	5.10%
Beverage and Tobacco	20.48%	14.06%
Textiles	7.70%	8.29%
Leather and Leather Products	5.44%	3.11%
Wood and Wood Products	16.48%	16.73%
Paper and Paper Products	7.04%	13.83%
Petroleum, Coal Products and Nuclear Fuels	18.68%	16.49%
Chemicals and Chemical Products	10.47%	7.41%
Rubber, Plastic and their Products	17.32%	14.36%

<sup>7</sup> RBI Handbook of Statistics on Indian Economy (2024-25), Table 63, available at <https://tinyurl.com/2rme64wd>.

<sup>8</sup> RBI Bulletin, October 2025: <https://tinyurl.com/yjehzk5y>.

Glass and Glassware	22.46%	11.19%
Cement and Cement Products	1.23%	-0.01%
Basic Metal and Metal Product	7.97%	12.76%
All Engineering	8.64%	21.98%
Vehicles, Vehicle Parts and Transport Equipment	9.75%	5.20%
Gems and Jewellery	4.53%	1.01%
Construction	5.92%	12.54%
Other Industries	5.38%	17.38%
Source: Reserve Bank of India (RBI) Database on Indian Economy.		

8.15. The subsequent sections of this chapter are organized as follows. The next two sections provide an overview of progress and policy measures across various industrial segments, including core input industries and capital and consumer goods sectors. This is followed by high-growth sector spotlights, offering in-depth analyses of selected sectors—electronics, automotive, and pharmaceuticals—focusing on exports, value-added activities, and technology adoption, as well as flagship initiatives to promote manufacturing. This is followed by a brief discussion on the cross-cutting structural pillars of competitiveness: innovation and R&D, regulatory reforms [including a review of Quality Control Orders (QCOs)], infrastructure and logistics, and scaling up the Micro, Small and Medium Enterprises (MSMEs). The final section concludes the discussion and presents an indicative roadmap towards greater integration with the GVCs.

## CORE INPUT INDUSTRIES

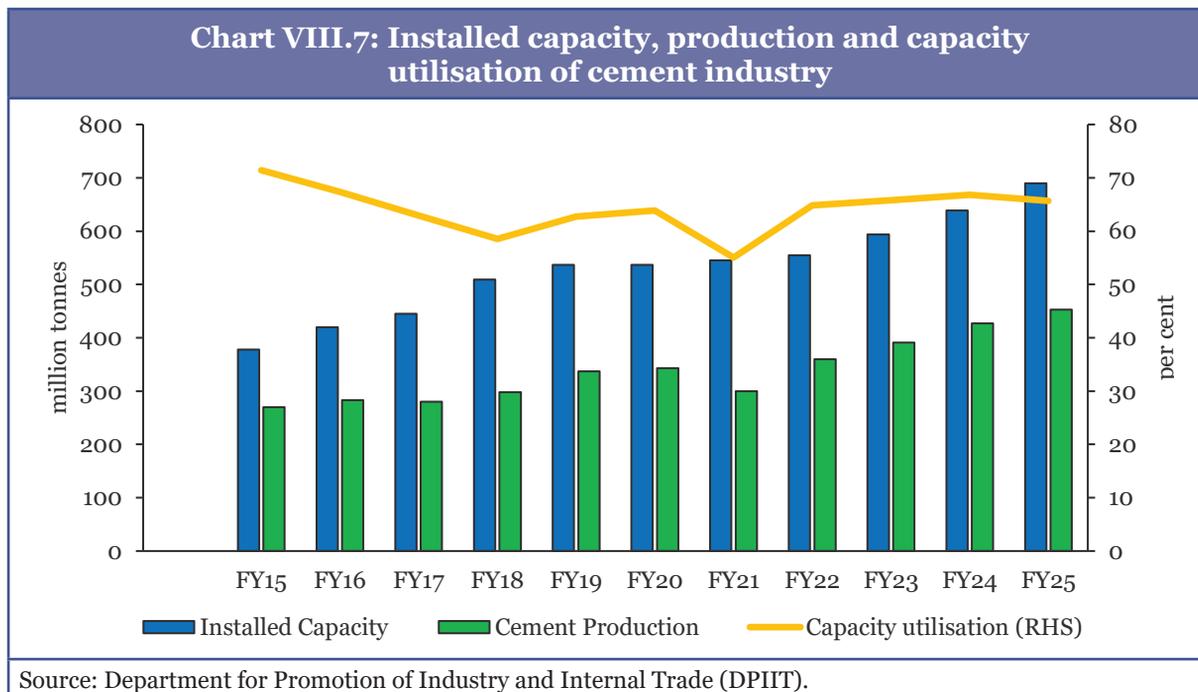
### Cement

8.16. India is the second-largest cement producer in the world after China. The Indian cement industry comprises 160 integrated large cement plants, 130 grinding units and 62 mini cement plants. The current annual installed capacity of the cement industry in India is about 690 million tonnes, with cement production of around 453 million tonnes in FY25.<sup>9</sup> Most of the cement plants in India are located near the raw material sources. About 85 per cent of the cement industry is concentrated in the states of Rajasthan, Andhra Pradesh, Telangana, Karnataka, Madhya Pradesh, Gujarat, Tamil Nadu, Maharashtra, Uttar Pradesh, Chhattisgarh and West Bengal. The industry has adequate installed capacity to meet the domestic demand for cement. Domestic cement consumption in India is approximately 290 kg per capita, compared to a global average of 540 kg per capita.<sup>10</sup>

<sup>9</sup> DPIIT.

<sup>10</sup> *ibid.*

8.17. The cement industry is mainly driven by robust infrastructure development and urbanisation. The Government's focus on mega infrastructure projects such as highways, railways, housing schemes, smart cities and rural development and industrial growth is expected to fuel cement demand significantly.



## Steel

8.18. The steel sector serves as the backbone of industrialisation and infrastructure, securing India's position as the world's second-largest crude steel producer. The sector has undergone a major transformation in the last five years, largely driven by strong domestic demand from the construction and manufacturing sectors.

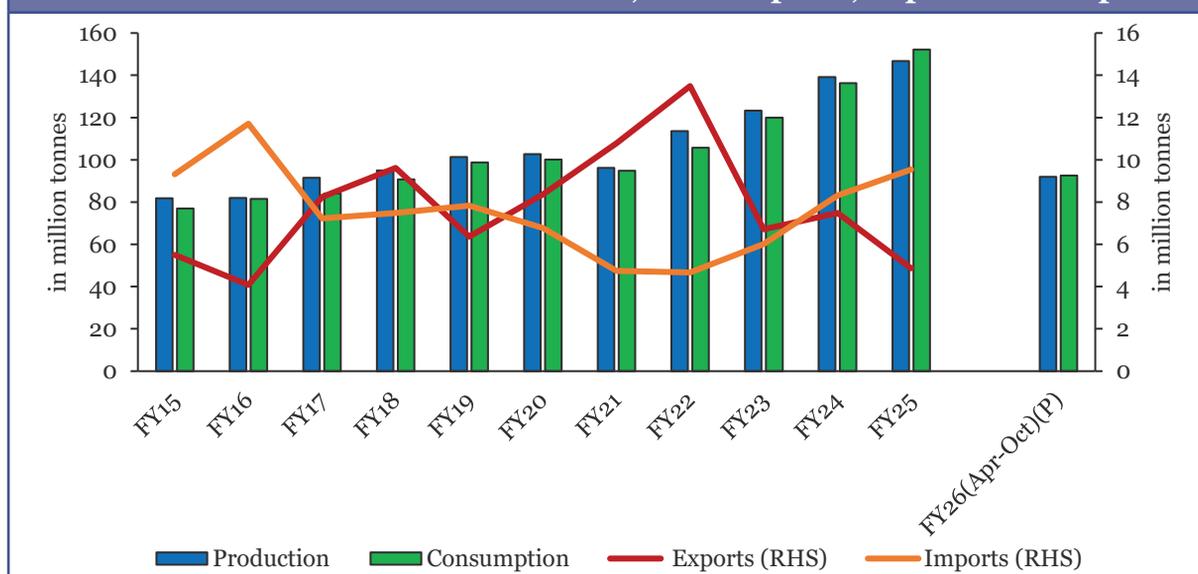
**Table VIII.2: Growth in Steel Production and Consumption**

Metric	2020-21 (MT)	2024-25 (MT)	CAGR (per cent)
Crude Steel Production	103.54	152.18	10.1
Finished Steel Production	96.20	146.69	11.1
Steel Consumption	94.89	152.13	12.5

Source: Ministry of Steel.

8.19. This momentum continued into the fiscal year 2025-26, with crude steel production growing by 11.7 per cent, finished steel production increasing by 10.8 per cent, and consumption rising by 7.8 per cent during April-October 2025-26, compared to the corresponding period last year.<sup>11</sup>

<sup>11</sup> Ministry of Steel.

**Chart VIII.8: Finished Steel Production, Consumption, Exports and Imports**

Source: Ministry of Steel.

8.20. To sustain the sector's robust growth and foster self-reliance, the Government launched the Production-Linked Incentive (PLI) Scheme for Specialty Steel in 2021, with an outlay of ₹6,322 crore, aimed at promoting high-value, niche products. As of October 2025, cumulative investment under the PLI scheme reached ₹23,022 crore, with production of 2.34 million tonnes (MT) of specialty steel.<sup>12</sup>

8.21. However, the sector faces challenges related to international price disparity and raw material security.<sup>13</sup> India was a net importer of steel during FY26 (April–October), primarily due to low international prices which resulted in lower margins on exports and cheaper imports. While India is largely self-sufficient in iron ore, the industry faces critical dependence on imported Coking Coal. To mitigate global supply risks, the Ministry of Coal launched Mission Coking Coal in 2022 with a view to significantly enhance domestic raw coking coal production to 140 MT by 2030.

## Coal

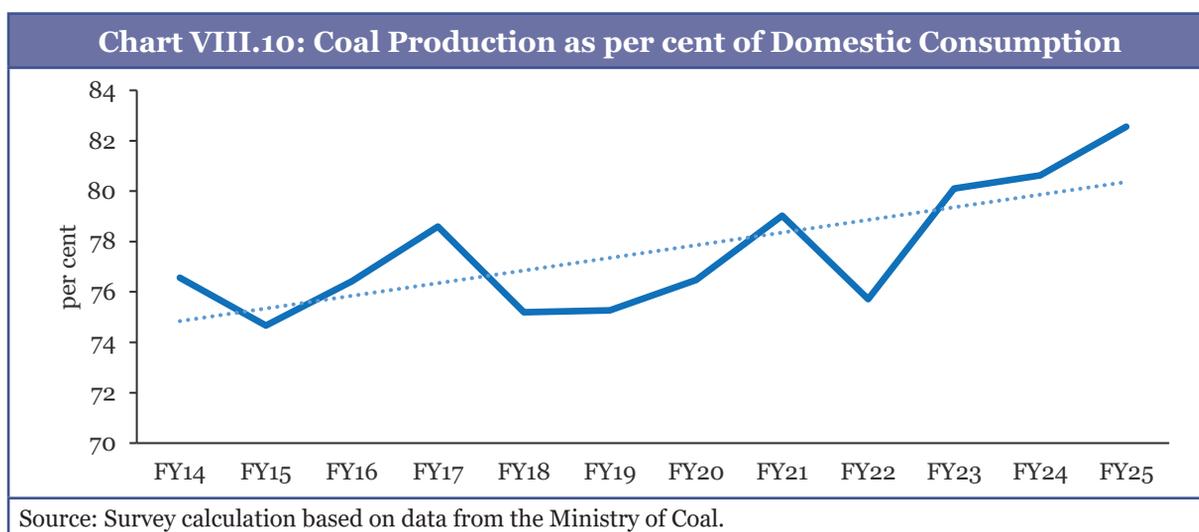
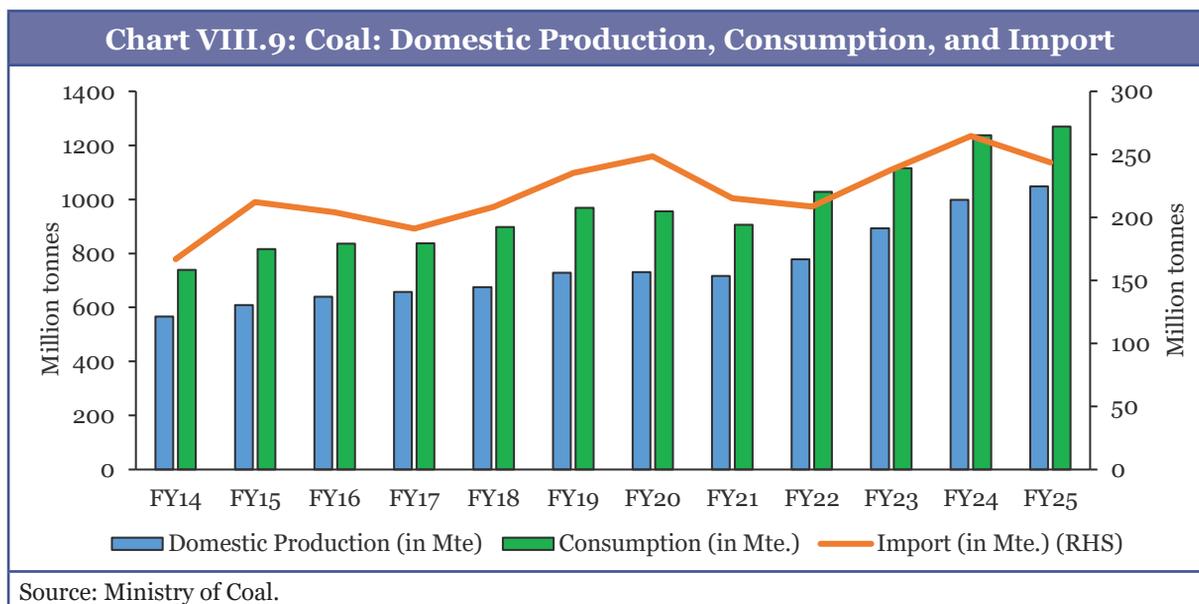
8.22. With the fifth-largest coal reserves and as the second-largest consumer, coal remains crucial, contributing 55 per cent to the national energy mix and fuelling over 74 per cent of total power generation.<sup>14</sup> India's coal industry reached historic heights in FY25, producing 1,047.52 Million Tonnes (MT) of coal—a 4.98 per cent increase from the previous year's 997.83 MT. This represents the highest coal production the country has ever achieved, demonstrating the industry's impressive growth and

<sup>12</sup> *ibid.*

<sup>13</sup> *ibid.*

<sup>14</sup> <https://tinyurl.com/2ceh389y>.

importance to India's energy needs. Concurrently, the total coal supply surged by 5.38 per cent, reaching 1,025.33 MT in FY25. Driven by this strong domestic output, imports registered a significant 7.9 per cent decline, falling from 264.53 MT in FY24 to 243.62 MT in FY25.<sup>15</sup> Furthermore, the ratio of domestic production to consumption has also steadily improved over the past decade, as production growth has consistently outpaced consumption growth (Chart VIII.10).



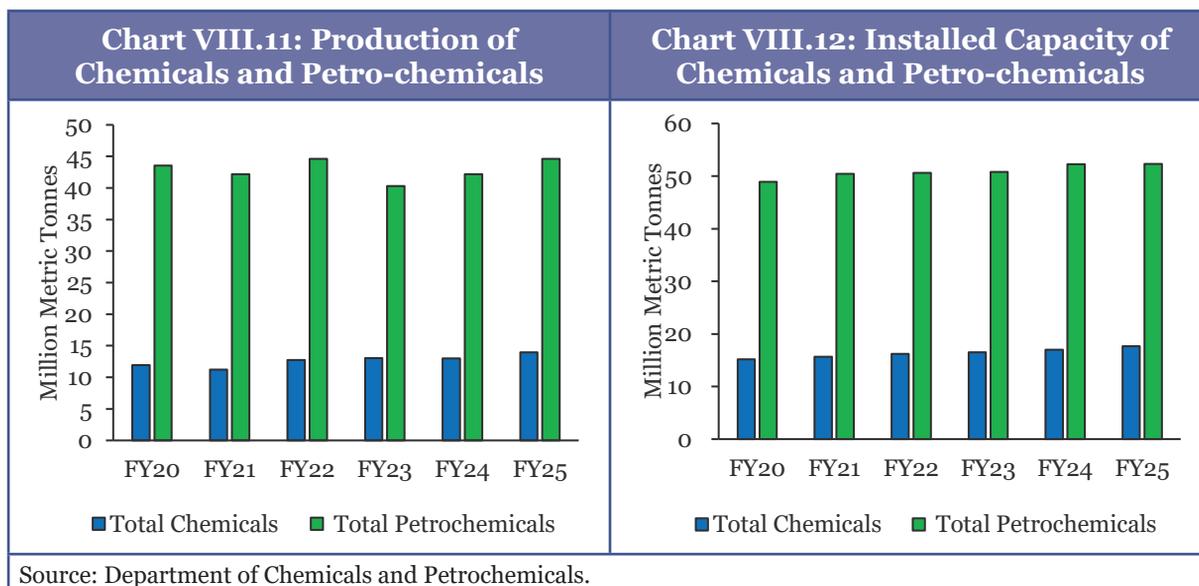
## Chemicals & Petrochemicals

8.23. The Chemicals and Petrochemicals sector continues to play a significant role in industrial development of the economy, having strong backward linkages with petroleum refining and natural gas processing, as well as forward linkages with

<sup>15</sup> Ministry of Coal.

numerous downstream industries. The sector contributed 8.1 per cent to the overall manufacturing sector's GVA in FY24.

8.24. The production of selected major chemicals and petrochemicals<sup>16</sup> has demonstrated a consistent upward trend over the last decade. The total production of Major Chemicals and Petrochemicals reached 58,617 thousand MT in FY25, as compared to 45,638 thousand MT in FY16, registering a Compound Annual Growth Rate (CAGR) of 2.8 per cent during the period FY16 to FY25.<sup>17</sup>



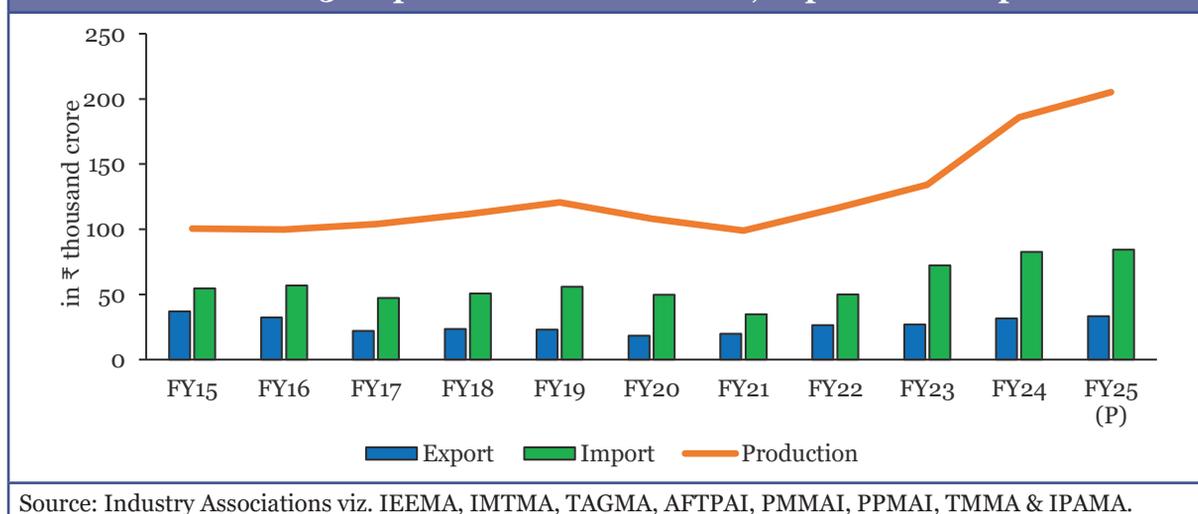
## PERFORMANCE OF CAPITAL GOODS AND CONSUMER GOODS INDUSTRIES

### Capital Goods

8.25. The export performance of the Capital Goods sector since FY22 is closely aligned with the expansion in domestic production capacity and the strengthening of domestic investment activity. Simultaneously, imports have registered consistent growth, reflecting robust domestic investment demand, as well as a reliance on technologically advanced imported machinery. Overall, these dual trends indicate strong domestic investment cycles but also indicate the continuing need to reduce dependence on imported high-tech capital goods.

<sup>16</sup> Department of Chemicals and Petrochemicals monitors selected Major Chemicals and Petrochemicals products only. The data source in respect of Installed Capacity and Production of Chemical products is Monthly Production Reports (MPRs) received from the chemical manufactures under large and medium scale units only.

<sup>17</sup> Department of Chemicals and Petrochemicals.

**Chart VIII.13: Capital Goods: Production, Exports and Imports**

8.26. The Government is actively trying to enhance the competitiveness of the Capital Goods Sector through Phase II of the Scheme on Enhancement of Competitiveness in the Indian Capital Goods Sector, launched in 2022. The scheme focuses on six core components, including the identification of technologies through technology innovation portals, the establishment of new Advanced Centres of Excellence (CoEs), Common Engineering Facility Centres (CEFCs), the upgradation of existing testing and certification centres, alongside robust skilling initiatives. Under Phase II of the Scheme, a total of 29 projects with total cost of ₹891.37 crore with government contribution of ₹714.64 crore have been sanctioned, as of November 2025. Many technologies developed under the scheme have also captured export markets in countries such as France, Belgium, Qatar and others.<sup>18</sup>

## Automobile

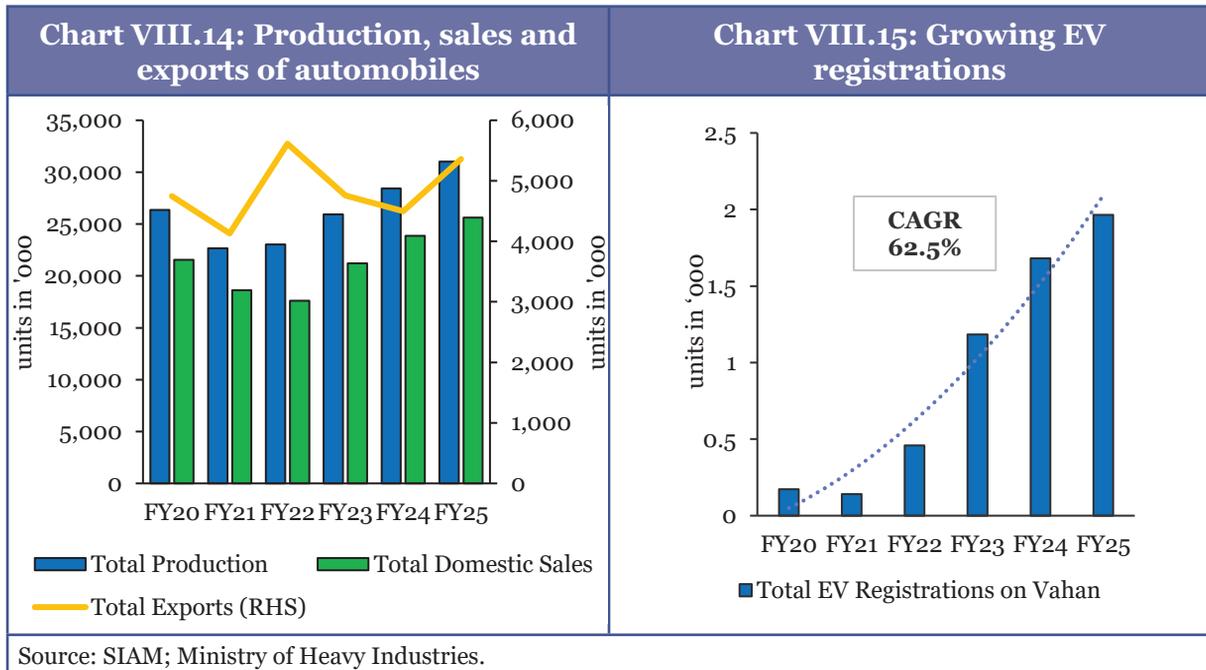
8.27. The automotive industry is a significant driver of economic growth, with India established as the world's largest market for Two-Wheelers and Three-Wheelers and the third-largest market globally for Passenger Vehicles (PV) and Commercial Vehicles (CV). Supported by a vast manufacturing and auto component ecosystem, the sector provides direct and indirect employment to over 30 million people and contributes significantly to public finances, accounting for nearly 15 per cent of the country's GST collections.<sup>19</sup>

8.28. The industry is also witnessing tremendous growth in exports, with more than 5.3 million vehicles shipped across Passenger, Commercial, Two-Wheeler, and Three-Wheeler segments in the FY25 and posting double-digit growth in the H1 of 2025-26, reflecting rising global acceptance of India-made vehicles. Overall, the industry has

<sup>18</sup> Ministry of Heavy Industries.

<sup>19</sup> *ibid.*

recorded nearly 33 per cent growth in production over the last decade (from FY15 to FY25). A robust demand-side recovery has driven both production growth and sales in the post-pandemic period. Furthermore, government initiatives highlighted in Box VIII.1 below have driven significant growth in Electric Vehicle (EV) registrations in recent years (Chart VIII.15).



### Box VIII.1: Strategic Policy Interventions for Electric Mobility

- **PLI Scheme for Automobile & Auto Components Industry (PLI-Auto Scheme)** approved in September 2021 with ₹25,938 crore outlay incentivises high-value Advanced Automotive Technology (AAT) vehicles and products, and has attracted a cumulative investment of ₹35,657 crore till September 2025.
- **PLI scheme for ‘National Programme on Advanced Chemistry Cell (ACC) Battery Storage’ (PLI ACC Scheme)** with ₹18,100 Crore outlay for 50 GWh capacity is localising ACC manufacturing, with 40 GWh capacity already awarded, strengthening the EV ecosystem.
- **PM E-DRIVE Scheme:** Launched in September 2024 with an outlay of ₹10,900 crore, which provides demand incentives for e-2W and e-3W, and extends support to new categories, including e-trucks and e-ambulances, alongside funding for charging infrastructure and testing agency upgrades.
- **PM e-Bus Sewa-Payment Security Mechanism (PSM) Scheme** notified in October 2024 with an estimated financial outlay of ₹3,435.33 crore, to support deployment of over 38,000 electric buses. The objective of the Scheme is to provide payment security in case of default by public transport authorities for making timely payment to selected bidders/operators/OEMs on their monthly payment obligations for operation of electric buses.<sup>20</sup>

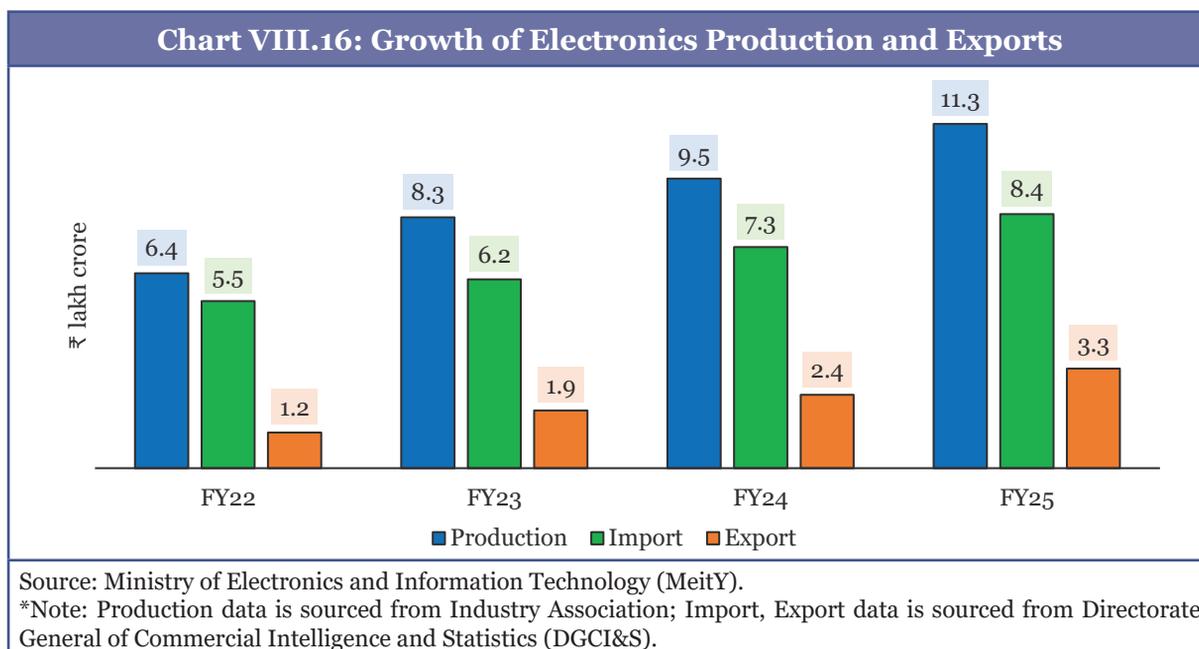
<sup>20</sup> <https://tinyurl.com/45j5ye3u>.

- **Scheme to Promote Manufacturing of Electric Passenger Cars in India (SMEC)**, notified in March 2024 aims to attract investments from global EV manufacturers and promote India as a manufacturing destination for e-cars, by allowing temporary imports of high-value e-4W at a reduced customs duty, contingent upon a minimum investment of ₹4,150 crore (USD 500 million) and achieving mandatory phased Domestic Value Addition (DVA) targets.

## Electronics

8.29. India's electronics sector has undergone a structural transformation in recent years, ascending from the seventh-largest export category in FY22 to the third-largest and fastest-growing in FY25. This momentum continued into the first half of FY26, with electronics exports reaching USD 22.2 billion, positioning the sector on track to become the second-largest exported item.<sup>21</sup>

8.30. This growth is underpinned by a remarkable surge in domestic production and export volumes (Chart VIII.16). Central to this expansion is the mobile manufacturing segment, which witnessed a nearly 30-fold increase in production value, rising from ₹18,000 crore in FY15 to ₹5.45 lakh crore in FY25. Transitioning from a net importer to the world's second-largest mobile phone manufacturer, India now hosts over 300 manufacturing units, a significant leap from just two units in 2014.<sup>22</sup>



8.31. The government has also recognised the challenges inherent in building a competitive electronics manufacturing ecosystem—particularly the need for large

<sup>21</sup> Source: PIB Release available at <https://tinyurl.com/yy2z5zh5>.

<sup>22</sup> *ibid.*

capital investment, economies of scale, long gestation periods, access to cutting-edge technologies, and a highly skilled workforce. In response, a series of strategic interventions have been implemented (Box VIII.2) to enable domestic firms to overcome these barriers and integrate more effectively into GVCs.

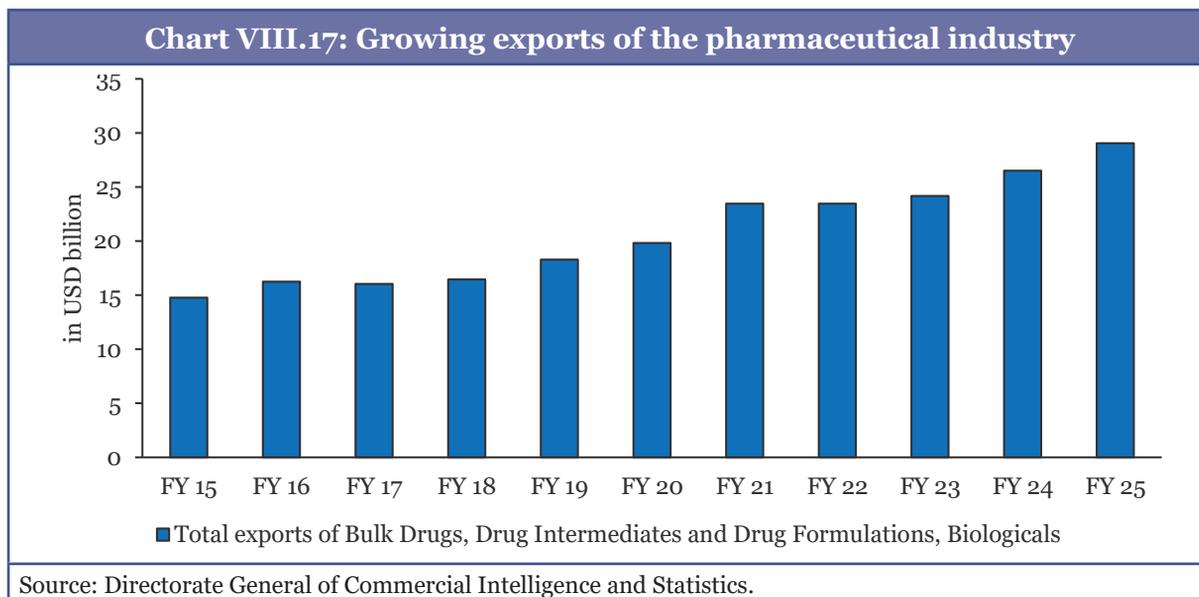
#### Box VIII.2: Key initiatives to strengthen electronics manufacturing

- **PLI Scheme for Large Scale Electronics Manufacturing:** Launched in April 2020, the scheme has generated a cumulative production of approximately ₹9.34 lakh crore, exports of ₹5.12 lakh crore and investment of ₹13,759 crore, as of September 2025.
- **PLI Scheme 2.0 for IT Hardware:** Launched in May 2023, the PLI schemes for IT Hardware have realised a cumulative production of ₹14,462.7 crore and investments of ₹892.47 crore as of September 2025.
- **Electronics Component Manufacturing Scheme (ECMS):** Notified in April 2025 with a budgetary outlay of ₹22,919 crore, the scheme aims to develop robust component manufacturing ecosystem by integrating domestic electronic industry with GVCs. It offers (a) turnover-linked incentive, (b) capex incentive and hybrid incentive (combination of (a) and (b)) on target segment products.
- **Electronics Manufacturing Clusters (EMC and EMC 2.0) Scheme:** These schemes provide "plug-and-play" infrastructure to attract global firms. Under EMC, 19 Greenfield clusters and 3 Common Facility Centers (CFCs) were approved, while EMC 2.0 has approved 11 clusters and 2 CFCs, as of September 2025.
- **Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS):** Notified in April 2020, it provides a 25 per cent financial incentive on capital expenditure for the downstream value chain. As of September 2025, 58 applications have been approved with a total proposed investment of ₹22,081 crore.
- **Modified Programme for Development of Semiconductors and Display Manufacturing Ecosystem:** Under the ₹76,000 crore programme, the India Semiconductor Mission (ISM) has approved landmark projects, including Micron's ATMP (Assembly, Testing, Marking and Packaging) facility, Tata Electronics' Semiconductor Fab, one compound semiconductor fab and various other packaging facilities, as a first step towards high-tech self-reliance. In addition, 24 projects for financial support and 100 companies for design infrastructure support for chip design to be implemented by domestic start-ups/ MSMEs have been approved.

## Pharmaceuticals

8.32. The Indian pharmaceutical industry is the world's third-largest by volume, meeting approximately 20 per cent of global generics demand, with exports to 191 countries in FY25. Over 50 per cent of these exports are directed to highly regulated

markets such as the United States and Europe. Beyond generics, India is a global leader in low-cost vaccine supply, providing a majority of the world's diphtheria, tetanus and pertussis (DPT), Bacillus Calmette-Guerin (BCG) and measles vaccines. In FY25, the sector's annual turnover reached ₹4.72 lakh crore, with exports growing at a CAGR of 7 per cent over the last decade (FY15 to FY 25) (Chart VIII.17).<sup>23</sup>



8.33. Moreover, India's medical devices sector is also rapidly becoming globally competitive, with exports to 187 countries in FY25. The industry now manufactures high-end equipment, including MRI and CT scanners, linear accelerators, cardiac stents, and ventilators. This expansion into sophisticated imaging and life-support technologies marks a significant shift toward high-tech medical manufacturing. Key initiatives for both sectors are detailed in Box VIII.3.

8.34. India currently ranks 11<sup>th</sup> globally in pharmaceutical exports by value, with a 3 per cent share and medical devices exports have grown significantly from USD 2.5 billion in FY21 to USD 4.1 billion in FY25, though there exists substantial scope for further expansion.<sup>24</sup> To move up the value chain, the pharmaceutical industry is shifting from a volume-driven to a value-driven approach, with greater emphasis on complex generics, biosimilars, and innovation. Likewise, scaling up the medical devices sector necessitates reducing import dependence through the adoption of advanced manufacturing technologies such as AI and 3D printing, along with streamlining global certification processes to strengthen international market access.

<sup>23</sup> Department of Pharmaceuticals.

<sup>24</sup> *ibid.*

### Box VIII.3: Key policy initiatives in the pharmaceutical sector

- **Supply Chain Resilience (PLI for Bulk Drugs):** To mitigate reliance on imported Active Pharmaceutical Ingredients (APIs) or their Key Starting Materials (KSMs) or Drug Intermediates (DIs), the PLI scheme for Bulk Drugs has mobilised investments worth ₹4,763 crore as of September 2025 and created manufacturing capacity of 55,000 MT per year for 26 critical products, including a strategic focus on fermentation-based synthesis for KSMs like Penicillin G Potassium, which is the precursor for several semi-synthetic antibiotics, such as Amoxicillin, Ampicillin, Cloxacillin and Dicloxacillin.
- **Strengthening of Pharmaceutical Industry (SPI):** With an outlay of ₹500 crore, this scheme supports MSMEs and clusters. Under the Revamped Pharmaceuticals Technology Upgradation Scheme (RPTUAS), 255 applications have been approved to facilitate units align with global standards.
- **Scheme for Promotion of Bulk Drug Parks:** Three world-class parks are being developed in Gujarat, Himachal Pradesh, and Andhra Pradesh with a total ₹3,000 crore outlay.
- **PLI for Medical Devices:** As of September 2025, the scheme has attracted ₹1,093.69 crore in actual investment, and manufacturing of 57 high-end medical devices has started in the country.
- **Scheme for Promotion of Medical Devices Parks:** Final approval for financial assistance of ₹100 crore each has been given to the states of Uttar Pradesh, Tamil Nadu and Madhya Pradesh. Under the scheme, the land has already been allotted to 184 manufacturers.
- **Strengthening of Medical Device Industry (SMDI) Scheme:** Launched in November 2024 with a ₹500 crore outlay, this scheme focuses on reducing import dependence, capacity building, and supporting clinical studies.

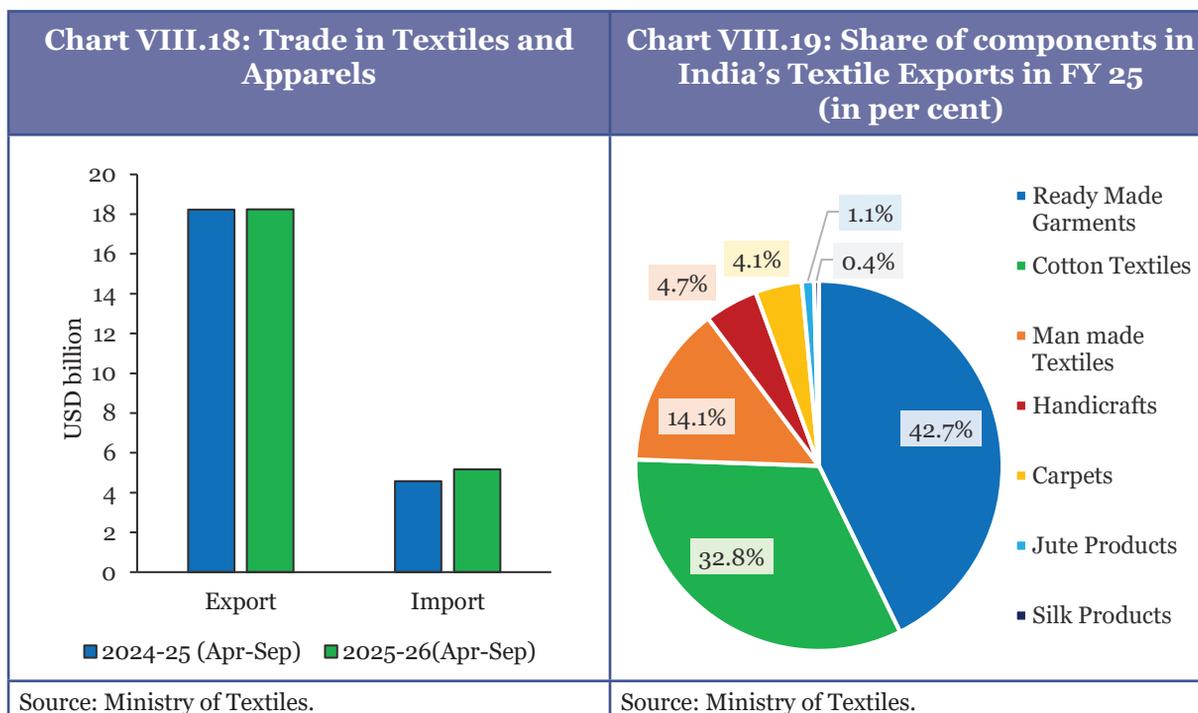
## Textiles

8.35. The Indian apparel & textile industry, with a size of about USD 179 billion, contributes close to 2 per cent of GDP and accounts for about 11 per cent of the manufacturing GVA. India is the world's largest cultivator of cotton by acreage and the largest producer of jute, as well as the second-largest producer of silk and cotton. Beyond natural fibres, India is a major global hub in the man-made fibres (MMF) segment, ranking second globally, supported by large, technologically advanced manufacturing facilities. The country is the second-largest producer of polyester and viscose fibres.<sup>25</sup>

8.36. India is the 6<sup>th</sup> largest global exporter of textiles and apparel, with a share of about 4 per cent in world exports in this segment. India's export of Textiles and Apparel (including Handicrafts) increased to USD 37.75 billion in FY25, up from USD 35.87 billion in FY24.<sup>26</sup>

<sup>25</sup> Ministry of Textiles.

<sup>26</sup> *ibid.*



8.37. While India's textiles sector possesses significant intrinsic strengths, the sector faces challenges such as, small scale and fragmentation of the value chain, heavy reliance on cotton [which contrasts with the global market's focus on Man-Made Fibres (MMF)], limited FDI and technology adoption. To drive a structural transformation, the Government has taken several initiatives such as the launch of the PM-Mega Integrated Textile Region and Apparel Parks (PM-MITRA) Scheme to facilitate economies of scale and reduce logistics costs; revision to the Production Linked Incentive (PLI) Scheme for MMF and Technical Textiles in October 2025 to encourage fresh investments and ease entry barriers such as expansion of eligible MMF and technical textile product lines; reduction in minimum investment thresholds (from ₹300 crore to ₹150 crore and from ₹100 crore to ₹50 crore); and lowering the incremental turnover requirement from 25 per cent to 10 per cent.

8.38. Furthermore, to alleviate raw material constraints and reduce production costs, the Government strategically revoked multiple Quality Control Orders (QCOs) in the MMF and viscose value chains in November 2025.<sup>27</sup> Besides, the technical textiles segment has been supported by the National Technical Textile Mission (NTTM), launched with an outlay of ₹1,480 crore (2020-21 to 2025-26), which focuses on R&D, market development, and skill development to position India as a global leader in technical textiles.

<sup>27</sup> Department of Chemicals and Petrochemicals (DCPC) revoked 14 QCOs—seven of them relating to the polyester value chain—on 12 November 2025, followed by Ministry of Textiles' revocation of QCO on viscose staple fibre (VSF) on 18 November 2025. [Source: Ministry of Textiles].

## KEY INITIATIVES TO PROMOTE MANUFACTURING

### Performance Linked Incentive (PLI) scheme

8.39. In alignment with India's vision of 'Aatmanirbhar Bharat', the Production Linked Incentive (PLI) Scheme was launched in 2020 and now spanning 14 key sectors, with an outlay of ₹1.97 lakh crore. The core purpose of these schemes is to attract investments in key sectors and introduce cutting-edge technology, ensure efficiency, and achieve economies of size and scale, thereby making Indian companies and manufacturers globally competitive. Till September 2025, under the PLI scheme, an actual investment of over ₹2.0 lakh crore has been realised, leading to incremental production/sales of over ₹18.70 lakh crore and employment generation of over 12.60 lakhs (direct and indirect). Cumulative incentives of ₹23,946 crore have been disbursed across 12 sectors, with 806 applications approved across all 14 sectors. The PLI Schemes have witnessed exports surpassing ₹8.20 lakh crore, driven significantly by sectors like electronics, pharmaceuticals, and telecom & networking products.<sup>28</sup>

8.40. Sectoral gains are tangible and worth noting. The electronics sector has emerged as a flagship success story under the PLI strategy. The PLI Scheme has encouraged major smartphone companies to re-locate their production to India. As a result, India has become a major mobile phone manufacturing hub.<sup>29</sup> In the first three years, pharmaceutical sales under PLI Scheme for Pharmaceuticals crossed ₹2.63 lakh crore, including exports worth ₹1.69 lakh crore and overall, Domestic Value Addition in the sector has been 83.74 per cent as on March 2025.<sup>30</sup> Further, the PLI scheme for automobile and auto-components has attracted cumulative investments worth ₹35,657 crore, resulting in creation of 48,974 jobs, until September 2025.<sup>31</sup>

### National Manufacturing Mission

8.41. Complementing PLI, the National Manufacturing Mission (NMM), was announced in Union Budget 2025–26. The NMM aims to boost innovation, raise competitiveness, and expand manufacturing capacity across priority sectors, complementing Make in India and the Atmanirbhar Bharat push. It emphasises faster technology adoption and deeper MSME integration into value chains.

---

<sup>28</sup> Department for Promotion of Industry and Internal Trade (DPIIT).

<sup>29</sup> Source: PIB Release available at <https://tinyurl.com/3ffsxy57>.

<sup>30</sup> Department of Pharmaceuticals

<sup>31</sup> Ministry of Heavy Industries.

**Box VIII.4: National Mission on Manufacturing (NMM)<sup>\*32</sup>**

The **National Mission on Manufacturing (NMM)**, announced in the Union Budget 2025-26, represents the foundational policy blueprint for accelerating India's industrial growth and global competitiveness over the next decade. It sets ambitious targets for 2035, aiming to double the manufacturing sector's contribution to GDP from 12.9 per cent (2023) to 25 per cent and generate 143 million jobs, along with boosting merchandise exports to USD 1.2 trillion by deepening integration into GVCs.

The Mission has a strategic two-pronged approach, dedicating major focus to sector-specific interventions across 20 to 30 prioritised industrial clusters. This would entail identifying industrial clusters based on parameters such as demand potential, employment generation capacity, and presence of natural endowments and classifying sectors into three archetypes: Scale (e.g., Automotive, Pharmaceuticals) for rapid expansion; Fix and Transform (e.g., Electronics, Capital Goods) for structural reform; and Seed (e.g., Semiconductors, Electric Vehicles) for strategic, innovation-led growth.

The other core activities are expected to address vital, cross-cutting challenges essential for competitiveness, including enhancing the Ease of Doing Business, strengthening Plug & Play Infrastructure, and improving workforce productivity through targeted skilling, empowering MSMEs, prioritising technology and provision of industrial housing. The NMM is thus expected to act as the central facilitator to align efforts across the Centre, States, and clusters, ensuring unified direction and convergence.

**Innovation and R&D: From Adopters to Innovators**

8.42. India's research and innovation ecosystem has, over the years, strengthened significantly, as its standing in scientific research output has risen sharply from the 7<sup>th</sup> position in 2010 to the 3<sup>rd</sup> position globally currently in terms of scholarly publications, reflecting a sustained expansion of academic research capacity.<sup>33</sup> The quality of output is also growing: the number of Indian universities in the 2026 Quacquarelli Symonds (QS) World University Rankings saw a five-fold jump, from 11 institutions in 2015 to 54 in 2026, making India the fourth most-represented country in the rankings.<sup>34</sup>

8.43. The country's ranking in the Global Innovation Index (GII) improved from 66<sup>th</sup> in 2019 to 38<sup>th</sup> in 2025. This places India at the top of the rankings within the lower-middle-income country group and first in the Central and Southern Asia region.<sup>35</sup>

32 Source: NITI Aayog. \*The National Mission on Manufacturing (NMM) was announced in the Union Budget 2025-26. All objectives, components, and institutional arrangements described herein are reported to be at the proposed level.

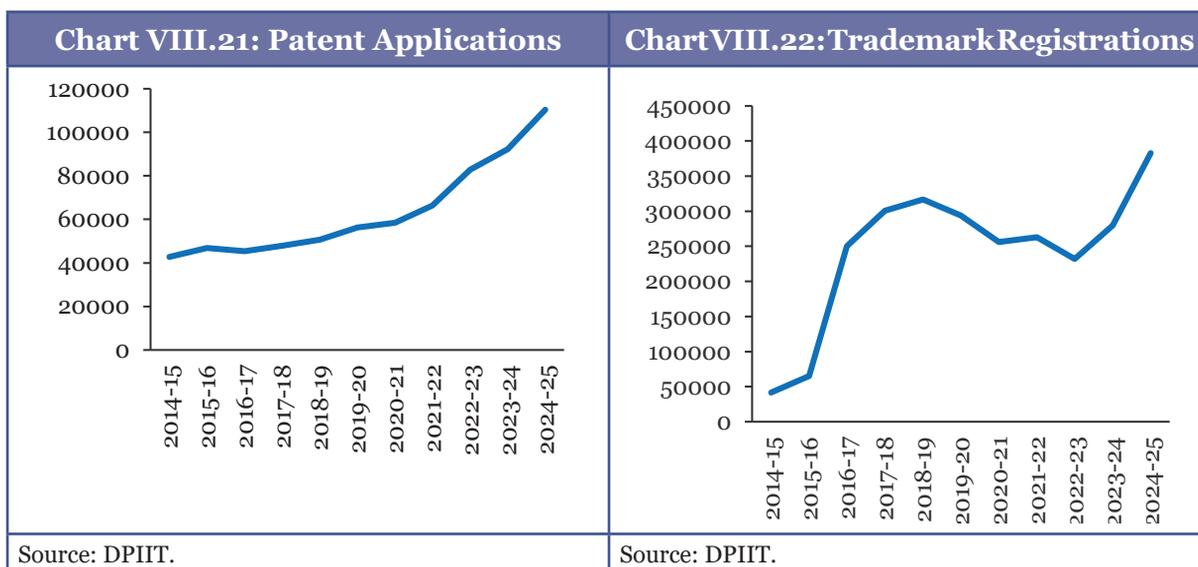
33 Department of Science and Technology.

34 PIB Release available at <https://tinyurl.com/3m44bb4m>.

35 Global Innovation Index 2025. World Intellectual Property Organization. <https://tinyurl.com/3ut3cn58>.



8.44. Bengaluru, Delhi and Mumbai feature among the top 50 most innovation-intensive clusters in the world<sup>36</sup> and the country's innovation output as a whole, has recorded a marked growth. Emerging as a significant global player in Intellectual Property (IP), India ranks 4<sup>th</sup> in trademarks, 6<sup>th</sup> in patents, and 7<sup>th</sup> in industrial designs in global filings in 2024.<sup>37</sup> From FY20 to FY25, patent applications filed nearly doubled, and trademark registrations grew 1.5 times. Designs registered increased by 2.5 times. The increased diffusion of design registrations alongside patent activity suggests a critical shift towards differentiated products, process innovation, and branding, marking an economy moving up the value chain.



8.45. Marking a shift from the trends of a few years ago, where public-sector drove innovation, R&D now is also being driven by a vibrant start-up ecosystem in the country. The World Intellectual Property Organization (WIPO) ranks India 12<sup>th</sup> globally, for its

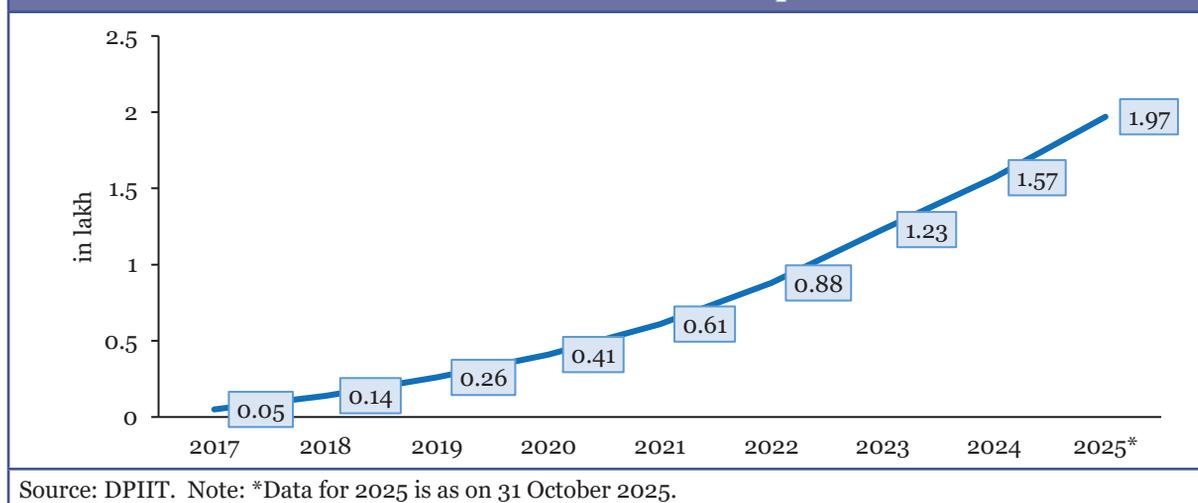
<sup>36</sup> *ibid.*

<sup>37</sup> Source: World IP Indicators 2025, WIPO available at <https://tinyurl.com/bdde84ab>.

entrepreneurship policies and entrepreneurship culture.<sup>38</sup> As an evidence to this, since the launch of the Startup India Initiative in 2016, the number of DPIIT-recognised startups has increased from approximately 500 to over 2 lakh as of 2025.<sup>39</sup> Flagship financing instruments, such as the Fund of Funds for Startups, the Startup India Seed Fund Scheme, and the Credit Guarantee Scheme for Startups, create an ecosystem that enables entrepreneurs to take risks and innovate with confidence.

8.46. Innovation activity is increasingly broad-based, spanning biotech, Artificial Intelligence (AI), digital services, and sustainability-oriented solutions, supported by a growing pipeline of risk capital, credit access, and incubator-led early-stage support. Collectively, these indicators signal a system that is expanding in scale, quality, and sophistication, with innovation activity graduating from niche research entities into a wider industrial base.

**Chart VIII.23: Rapid growth in DPIIT-Recognised Startups  
(Cumulative no. of Startups)**



### Box VIII.5: CSIR Progress in Applied Innovation

Over the last year and a half, between FY25 and the first half of FY26, the Council of Scientific and Industrial Research (CSIR) has demonstrated tangible progress in advancing applied research and translating it into deployable solutions across strategic sectors including infrastructure, health, chemicals, energy, aerospace, biotechnology and defence. Shifting from laboratory-oriented research towards impact-oriented research and facilitating technology transfer, CSIR has been working steadily towards supporting national goals of Aatmanirbharta and technology-led growth.

A key driver of CSIR's recent progress has been mission-mode innovation in infrastructure and materials. Indigenous technologies such as REJUPAVE and the ECOFIX pothole repair

<sup>38</sup> Economy Profile: India, WIPO: <https://tinyurl.com/29h8jd72>.

<sup>39</sup> Inputs received from DPIIT and Startup India Dashboard. As of 25th November, 2025.

system, designed for challenging terrain, are already deployed by the Border Roads Organisation (BRO) in high-altitude regions and are being increasingly adopted by state agencies. Complementing these are early deployments of India's first bio-bitumen highway, steel-slag road infrastructure, and trials with end-of-life plastics, all signalling a clear shift towards circular economy-aligned public works and context-specific applied innovation.

CSIR's applied innovation portfolio now extends into industrial processes, strategic materials, and health technologies with clear deployment pathways. The continuous-zero flow, zero-liquid discharge paracetamol production technology developed by CSIR-National Chemical Laboratory has already been licensed for commercial use, reducing manufacturing costs by an estimated 15-20 per cent. In defence and chemicals, CSIR-Indian Institute of Chemical Technology's (IICT) development of an indigenous process for CL-20 propellant materials strengthens self-reliance in high-energy materials. In biotechnology and health, CSIR's innovations range from an affordable molecular diagnostic for sickle cell anaemia to advances in gene editing platforms and targeted drug delivery for cancer. Collectively, these developments reflect a clear shift from laboratory research to deployable and commercially relevant technologies that support nation-building.

CSIR's work in applied innovation also extends to frontier technologies. The successful test flights of solar-powered high-altitude pseudo satellites (HAPS) capable of long-endurance flight for border security and telecom relay demonstrate deep capability development in autonomous systems. Likewise, indigenous developments in UAV propulsion engines, kamikaze drones, and the partnership with Bharat Electronics Limited for sensor systems demonstrate increasing linkages between public research and national defence capability. CSIR-NAL's technology transfer for commercial production of indigenously designed trainer aircraft (HANSA-3 NG) is another milestone, marking the first time a homegrown civil aircraft platform is moving to commercial manufacturing.

CSIR's recent progress demonstrates a maturing model of government-led applied innovation, where public R&D is increasingly moving beyond publication and prototyping toward deployment, industrial adoption and commercial transfer. By facilitating the transition of technologies from research labs to real-world deployment, this approach enhances technological self-reliance through faster innovation diffusion while broadening India's capacity in strategic and future-oriented fields.

8.47. India is also establishing itself as a strong contender in critical technologies. The Critical Technology Tracker, published by the Australian Strategic Policy Institute (ASPI)<sup>40</sup>, shows India now ranks among the top five countries in 45 out of 64 critical technologies, compared to just 4 technologies in the period from 2003 to 2007. This breadth across defence, space, quantum computing, AI, and advanced materials signals an expanding strategic capability essential for Aatmanirbharta.

<sup>40</sup> <https://tinyurl.com/4fkhmjc9>.

### Box VIII.6: India's Rankings\* in Critical Technology Research Output

Defence, space, robotics & transportation	<ul style="list-style-type: none"> <li>• 3<sup>rd</sup> in Advanced Aircraft Engines</li> <li>• 3<sup>rd</sup> in Autonomous underwater vehicles</li> <li>• 4<sup>th</sup> in Drones, Swarming and collaborative robots</li> </ul>
Quantum Computing	<ul style="list-style-type: none"> <li>• 3<sup>rd</sup> in post-quantum cryptography</li> <li>• 4<sup>th</sup> in Quantum Sensors</li> </ul>
Biotech, gene tech and vaccines	<ul style="list-style-type: none"> <li>• 2<sup>nd</sup> in Biological Manufacturing</li> <li>• 3<sup>rd</sup> in Novel Antibiotics and Antivirals</li> </ul>
Artificial Intelligence, Computing and Communications	<ul style="list-style-type: none"> <li>• 2<sup>nd</sup> in Mesh and Infrastructure Independent Networks</li> <li>• 3<sup>rd</sup> in Advanced radiofrequency communication, Protective cybersecurity technologies</li> <li>• 3<sup>rd</sup> in AI algorithms, machine learning, Natural Language Processing</li> </ul>
Advanced Materials	<ul style="list-style-type: none"> <li>• 2<sup>nd</sup> in Advanced Composite Materials, Smart Materials</li> <li>• 3<sup>rd</sup> in Nanoscale Materials, Coatings, Advanced Explosives</li> </ul>
Energy	<ul style="list-style-type: none"> <li>• 2<sup>nd</sup> in Biofuels</li> <li>• 3<sup>rd</sup> in Supercapacitors, Nuclear waste management &amp; recycling</li> <li>• 4<sup>th</sup> in Nuclear Energy, Hydrogen and ammonia for power</li> </ul>

\*Note: ASPI's rankings are research-output based and indicate relative scientific leadership and do not necessarily capture industrial maturity, commercial deployment, or production capabilities.  
Source: ASPI Critical Technology Tracker.

8.48. Despite notable progress in research and development, challenges remain, primarily concerning R&D expenditure intensity. India's Gross Expenditure on R&D (GERD) as a percentage of GDP stands at a modest 0.64 per cent, substantially below the global average. Leading economies, such as the US (3.48 per cent), China (2.43 per cent), and South Korea (4.91 per cent), invest significantly more.

8.49. Low expenditure in R&D is partly due to low investment in R&D from business sector, which accounts for only 41 per cent of the total expenditure. This is in stark contrast to countries such as China (77 per cent), United States (75 per cent), and South Korea (79 per cent), where business sector contributions to R&D are significantly

higher.<sup>41</sup> Bridging this disparity through various measures and fostering a conducive environment for private industry is critical for accelerating technological development. To drive this endeavour, the government has instituted a series of high-stakes, mission-driven initiatives.

8.50. A major institutional reform driving India's R&D and aimed at addressing the challenges highlighted above is the establishment of the Anusandhan National Research Foundation (ANRF) under the ANRF Act, 2023. The ANRF is intended to provide strategic direction, competitive funding opportunities and collaboration pathways across industry, academia and government. The initiatives taken up by ANRF are being complemented by a suite of mission-driven national programmes such as the National Quantum Mission, the National Mission on Interdisciplinary Cyber-Physical Systems, the IndiaAI Mission, the India Semiconductor Mission, and the National Green Hydrogen Mission. Each initiative focuses on building foundational scientific capability in sunrise domains, translating research into scalable industrial capacity.

8.51. To finance innovation at scale, the Government also announced a new Research, Development and Innovation (RDI) Fund with a total outlay of ₹1 lakh crore over six years and ₹20,000 crore allocated for FY26. The Fund is designed to catalyse private investment in high-tech R&D, support projects at advanced technological readiness levels, enable acquisition of strategically important technologies, and operationalise a Deep-Tech Fund of Funds. Together, the ANRF, the national missions and the RDI Fund form a consolidated architecture for expanding India's GERD beyond its current level and accelerating India's transition towards technological leadership and the broader objectives of Atmanirbhar Bharat.

#### Box VIII.7: Why the India Semiconductor Mission Matters

Microprocessors are products that are largely obscured from view in our day to day lives. Yet, they form the heart of our energy systems, financial markets, telecom networks, manufacturing units, hospitals, transportation networks, and satellites, among many other applications. The COVID-19 pandemic exposed the vulnerabilities in global semiconductor supply chains. Shortages impacted over 169 industries globally, causing price increases and production delays.<sup>42</sup> The absence of a steady supply of semiconductors is likely to hamper economic activities across sectors. Reliance on a handful of suppliers for semiconductors is an added risk. The India Semiconductor Mission (ISM), launched in 2021 aims to build domestic capacity across design, manufacturing, and innovation in semiconductors and is a first step towards in self-sufficiency and technological sovereignty.

<sup>41</sup> Department of Science and Technology (DST).

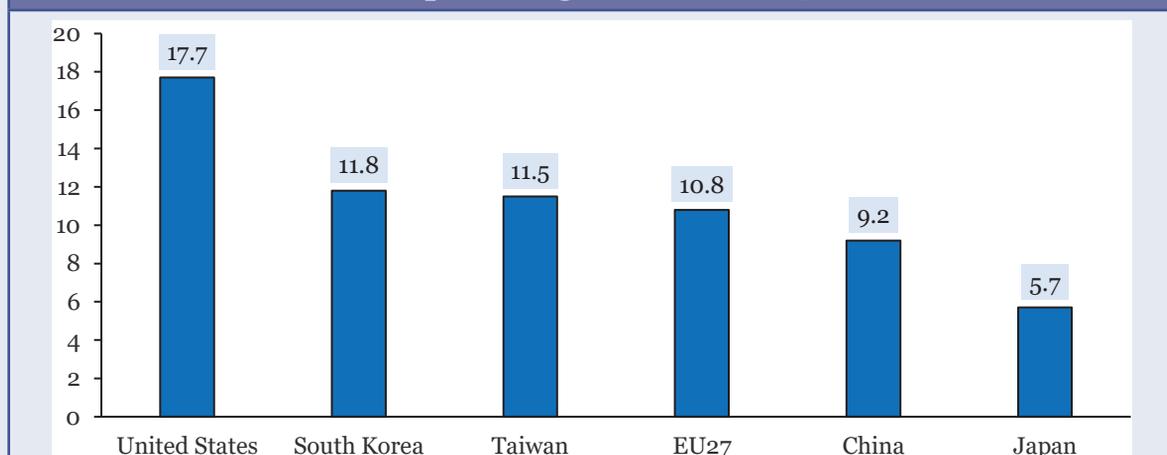
<sup>42</sup> Economic Survey 2021-22.

## Design

Semiconductor manufacturing begins with the design process, which determines the chip's architecture, which optimises parameters such as cost, power consumption and processing capabilities, based on the needs of the chip in question, making their designs incredibly complex. Progress in chip design requires consistent mix of multidisciplinary research, substantial investments, years of R&D for each new chip developed, and a highly skilled workforce. This makes semiconductors the most R&D intensive product to produce, even more than pharmaceuticals and software.

The mix of these factors is not something everyone could afford, nor get right, due to which the design process of cutting-edge chips is highly concentrated in a few developed nations. Global leaders in the design process include the United States, South Korea, Taiwan and Japan, who collectively account for 79.4 per cent of the global semiconductor Integrated Circuit (IC) design revenue.<sup>43</sup> Their edge is also maintained by the sustained investments in R&D, allowing them to capitalise on existing intellectual property to further their leadership.<sup>44</sup>

**Chart VIII.24: R&D Expenditures in semiconductor industry as a percentage of Sales (2024)**



Source: State of the U.S. Semiconductor Industry 2025, Semiconductor Industry Association.

## Manufacturing of semiconductors

The manufacturing phase of semiconductors is resource-intensive, requiring highly specialised machinery and facilities. Making semiconductors is extremely resource-intensive and depends on very specialised equipment and facilities. A modern semiconductor factory can cost around USD 10 billion to set up, largely because the machines used must work with nanometre-level precision. The supply of the machines capable of undertaking these complex tasks is concentrated with just 5 companies across 4 countries.<sup>45</sup>

43 Mapping the Semiconductor Supply Chain, Akhil Thadani & Gregory C. Allen. Center for Strategic and International Studies. May 2023.

44 Studies have highlighted the case for a more proactive and strategically calibrated engagement with global intellectual property rights (IPR) treaties to support innovation and R&D-led growth (See: Sanjeev Sanyal and Apurv Kumar Mishra, India and Global IPR Treaties, Working Paper, Economic Advisory Council to the Prime Minister, 2024).

45 Semiconductor Lithography Equipment Market Size & Share Analysis – Growth Trends and Forecasts (2024-2029), Mordor Intelligence.

Furthermore, at these nanometre scales, efficient production requires a high degree of control over the entire process, with specialised and sensitive equipment. Even here, the supply chain is highly concentrated. As of 2021, the United States, Japan and South Korea make up two-thirds of the global sales for wafer fabrication, assembly and test equipment.

Recent geopolitical events underscore a broader lesson: economies that depend on external access to foundational technologies increasingly face constraints not just in production, but in strategic autonomy. As advanced economies accelerate investments in semiconductor capacity and tighten export controls, access to chips becomes a determinant of competitiveness and also national security.

### **The India Semiconductor Mission for a Resilient India**

To address structural vulnerabilities and build resilience, the Government of India has undertaken a series of coordinated measures to develop an end-to-end domestic semiconductor system. The India Semiconductor Mission and the Semicon India programme together form the core of this strategy, supported by a ₹76,000 crore incentive framework to catalyse investment in fabrication, assembly, testing, marking and packaging facilities. Under these programmes, four targeted schemes have been launched, each extending fiscal support of 50 per cent of project cost/capex for semiconductor and display fabs, compound semiconductor facilities, and outsourced semiconductor assembly and testing units, alongside a dedicated Design Linked Incentive scheme to encourage domestic chip design. As of August 2025, ten semiconductor manufacturing and packaging projects have been approved with a cumulative investment of around ₹1.60 lakh crore in 6 states.<sup>46</sup> In addition, State Governments have also begun complementing the national framework, with initiatives such as Odisha's Semiconductor Manufacturing and Fabless Policy offering additional incentives and institutional support. As execution accelerates and capacity expands, these measures are expected to strengthen domestic semiconductor capabilities, enhance the resilience of critical supply chains and position India as a significant participant in the global semiconductor marketplace.

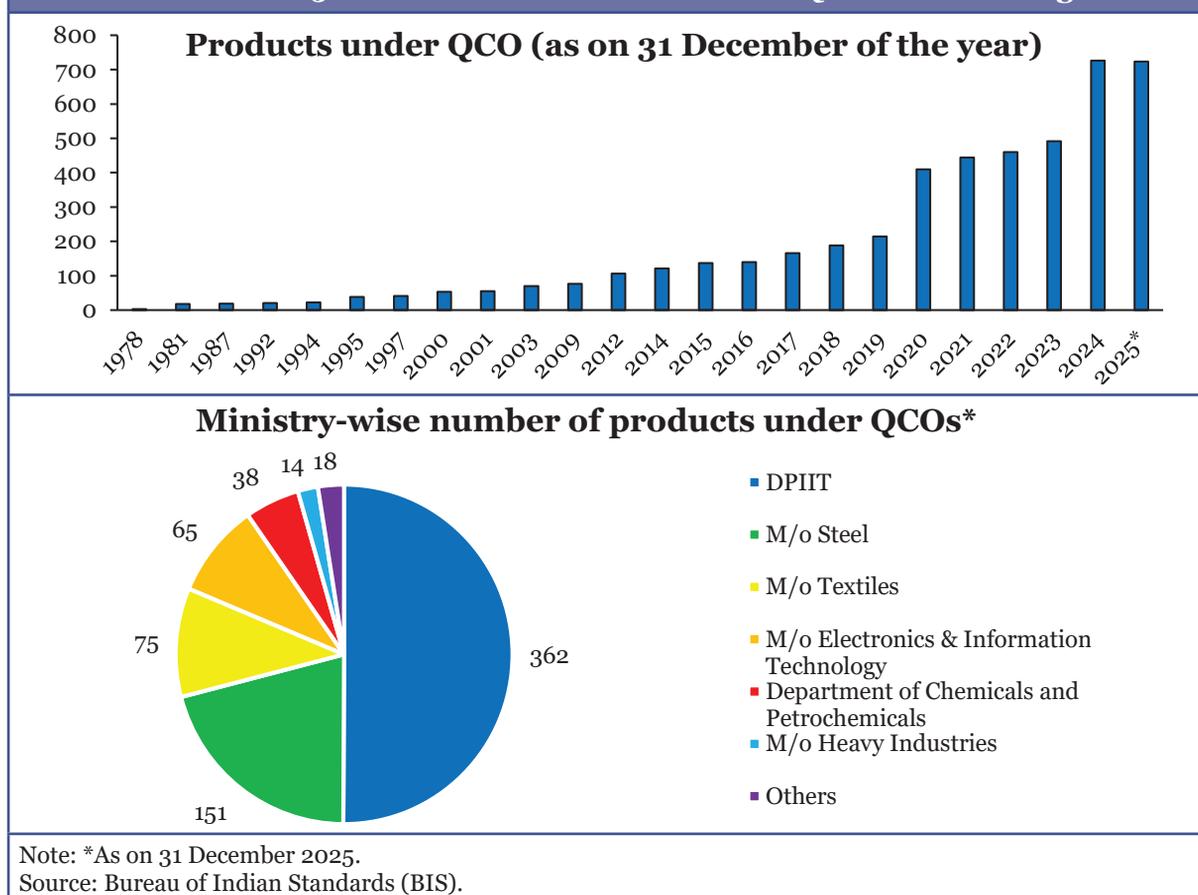
## **Quality control: Enhancing global competitiveness**

8.52. With the goals of the National Manufacturing Mission seeking to position India as an indispensable part of GVCs, quality aspect is as critical as cost competitiveness. In this context, Quality Control Orders (QCOs) are regulatory instruments that mandate conformity with the desired quality standards. The Government of India has significantly augmented mandatory quality assurance in India. As of 31 December 2025, a total of 143 QCOs covering 723 products have been notified by various ministries,<sup>47</sup> more than tripling the coverage from 214 products in 2019. The purpose of QCOs is to ensure that products meet stipulated quality standards, while avoiding market distortions and protecting consumer requirements.

<sup>46</sup> <https://tinyurl.com/4hap8fdy>.

<sup>47</sup> Apart from these, 2 Horizontal QCOs on Safety of all Household Electrical Appliances (as per IS 302 (Part 1)) and Safety of Machinery and Electrical Equipment have also been notified. (Source: Bureau of Indian Standards (BIS))

**Chart VIII.25: Growth in terms of number of QCOs and coverage**



**Box VIII.8: Quality Control-Towards Pragmatism**

In a global environment marked by tightening technical regulations, QCOs are vital for addressing and mitigating the reputational risks associated with inadequate and inconsistent quality. They level the playing field for firms that invest in quality while curbing the influx of substandard imports. In several sectors, the introduction of QCOs for finished goods has been accompanied by improved compliance and a reduction in the circulation of substandard products including sectors such as toys, transformers, footwear, and cement, directly contributing to India's long-term goal of overall improved standards.

A prominent example of this strategic approach leading to a fundamental trade shift is seen in the Toys sector. A Quality Control Order (QCO) for Toys was issued in 2020 w.e.f 01.01.2021, along with an increase in Basic Customs Duty (from 20 per cent to 60 per cent in Feb 2020, and subsequently to 70 per cent in March 2023) and mandatory sample testing of each import consignment to curb the import of sub-standard toys. The results demonstrate a clear structural transformation: between FY15 and FY23, imports of toys declined by 52 per cent, while exports soared by 239 per cent.<sup>48</sup> Crucially, India transitioned from being a net importer (in FY15) to a net exporter of toys from FY21 onwards. This shift was largely attributed to the quality regulations and tariff policies allowing domestic manufacturers to scale up and meet international quality benchmarks.

48 <https://tinyurl.com/4x9jusp7>.

Beyond quality, consumer and workplace safety also provide an equally compelling justification for mandatory standards. QCOs on products ranging from electrical appliances to helmets are essential for protecting public welfare and maintaining market confidence. This regulatory enforcement is to be further supported by enhanced surveillance, expanded testing infrastructure, and digitised certification processes.

While the rationale is clear, the design and implementation of QCOs should be grounded in economic practicality. Mandatory certification, while necessary, is not cost-free and can create friction if implemented without adequate preparation and due diligence, especially given that Micro, Small, and Medium Enterprises (MSMEs) form a significant part of India's industrial base. MSMEs often lack the capital to establish in-house testing facilities or adapt quickly to new certification requirements. Overly narrow transition periods can also lead to production delays, supply disruptions, and rising inventory costs, unintentionally burdening the firms QCOs are meant to support.

This becomes particularly relevant when QCOs extend to raw materials and intermediate inputs. Modern manufacturing is intrinsically linked to global suppliers. Mandating certification for specialised raw materials, intermediate inputs, or spare parts—particularly when domestic alternatives are scarce or non-existent—can inadvertently be counterproductive, causing delays in critical downstream sectors such as automotive, power, and electronics. QCOs on intermediates, therefore, require exceptional caution, with flexibility built in when domestic alternatives do not exist especially in view of complexity of modern global supply chains.

Therefore, QCOs should be approached pragmatically as instruments for strengthening quality assurance, consumer safety and strategic resilience within increasingly complex value chains.<sup>49</sup> If regulations are applied without comprehensive value-chain analysis, it can trigger cascading consequences, increasing costs and erode cost competitiveness. This interconnectedness was famously illustrated by economist Milton Friedman in his 1980 lecture. Holding up a pencil to the audience, he stated, "*...There is not a single person in the world who could make this pencil... When you go down to the store and buy this pencil, you are in effect trading a few minutes of your time for a few seconds of the time of all those thousands of people.*"<sup>50</sup>

A forward-looking QCO framework should, therefore, incorporate a rigorous pre-notification assessment, calibrated transition periods (especially for MSMEs), adequate national testing capacity, and a clear alignment with industry readiness. Critically, where sufficient domestic production capacity does not exist, the framework should provide exemptions or alternative pathways for specialised inputs such as raw materials, intermediates, spare parts, and quantities required for R&D. The Government recognises the importance of a balanced and adaptive approach, with recent regulatory decisions reflecting a willingness to recalibrate QCOs.<sup>51</sup> This balanced approach will allow QCOs to strengthen India's manufacturing capabilities without imposing undue burdens, ensuring that quality regulation remains a strategic enabler of long-term economic growth.

49 World Development Report 2025: Standards for Development (Spotlight 1).

50 Source: Free to Choose (1980) documentary/book, based on Leonard E. Read's 1958 essay "I, Pencil".

51 As per BIS, a total of 46 QCOs covering 51 products have been revoked by concerned regulators in 2025–26, while 3 QCOs covering 63 products and 20 categories of machines and electrical equipment under the Omnibus Technical Regulation (OTR), were deferred or suspended by concerned regulators in 2025-26.

## Infrastructure and Logistics: Improving Competitiveness

8.53. A competitive manufacturing ecosystem relies not only on firm-level productivity but also on the efficiency, connectivity and predictability of the infrastructure surrounding it. Over the past few years, the infrastructure push has shifted from project-level execution to systems-level planning. PM GatiShakti represents this structural shift by enabling multi-modal planning through a unified geospatial platform. As of November 2025, 57 Ministries and Departments have been onboarded, and over 1,700 data layers have been integrated into the National Master Plan for allowing planners to identify bottlenecks, optimise routes, and avoid duplication in capital expenditure.<sup>52</sup> The opening of PM GatiShakti Public and the Unified Geospatial Interface now provides private users with access to 230 curated datasets for planning investments and logistics strategies. This marks a transition away from Government-only planning to a systematic approach of shared national infrastructure intelligence, allowing efficient planning and resource utilisation.

8.54. States and districts have also been adopting this framework at scale, with 27 States notifying State Logistics Policies and 28 Aspirational Districts using the GatiShakti District Master Plan Module for area planning. This will then be extended to all 112 Aspirational Districts in the near term. Complementing this is the National Logistics Policy (NLP) and tools such as Logistics Ease Across Different States (LEADS) and the Unified Logistics Interface Platform (ULIP), which benchmark logistics competitiveness and integrate data across ministries. ULIP currently connects 44 systems across 11 ministries through over 2,000 data fields, with more than 1,700 companies registered and 200 crore API transactions executed. These investments in planning capability, digital integration and logistics intelligence are beginning to improve operational predictability for industry.

8.55. Infrastructure execution is advancing rapidly through the National Industrial Corridor Development Programme, which enables the development of new industrial cities with plug-and-play facilities and logistics hubs focused on multimodal connectivity. Phase-I cities such as Dholera, Shendra-Bidkin, Greater Noida and Vikram Udyogpuri are now operational, with 350 industrial plots allotted and investment of ₹2.02 lakh crore across sectors, including electronics, renewables, pharmaceuticals and EVs.<sup>53</sup> Complementing this are sector-specific interventions under the National Logistics Policy, such as the Sectoral Plan for Efficient Logistics for the cement industry. The industry is expected to experience reductions in its logistics costs through efficiency gains from multimodal connectivity and digital transparency.

---

<sup>52</sup> Department for Promotion of Industry and Internal Trade (DPIIT).

<sup>53</sup> *ibid.*

8.56. India's logistics strategy has transitioned beyond mere asset creation to an integrated ecosystem approach, combining physical infrastructure, digital public platforms (like ULIP), regulatory simplification, and corridor-based industrialisation (PM GatiShakti). This holistic approach aims to minimise logistics friction, financing delays, and coordination losses that previously constrained industrial competitiveness.

8.57. A new joint study by DPIIT and NCAER<sup>54</sup> estimates logistics costs at 7.97 per cent of GDP for FY24, which is lower than 8.84 and 8.79 per cent for FY23 and FY22, respectively. This indicates that initiatives like PM GatiShakti, Dedicated Freight Corridors (DFC), Bharatmala, and Sagarmala are already driving significant cost optimisation and efficiency gains. Collectively, these developments are thus building a more predictable and cost-competitive industrial environment, which will help India better integrate into GVCs. Further details on initiatives in the infrastructure sub-sectors leading to logistics improvements are presented in the infrastructure chapter (Chapter 9).

#### Box VIII.9: Why India must strengthen its industrial cluster strategy to compete globally

India's ambition to emerge as a globally competitive industrial hub will critically depend on the strength and scale of its industrial clusters. Evidence from across the world shows that high-performing clusters are not just contributors to industrial activity; they are central to a nation's export growth, attracting foreign investment, driving innovation and enhancing productivity. Countries that have successfully integrated into GVCs, starting from China, Vietnam to South Korea, all have done so through a small number of highly competitive, globally connected clusters that combine economic density with institutional agility. China's Greater Bay Area, for example, generates 35 per cent of national exports and 11 per cent of GDP while occupying less than 1 per cent of land. Vietnam's two key economic regions contribute nearly two-thirds of GDP and trade within just 11 per cent of its land area. These examples highlight a consistent pattern: industrial activity needs concentration, connectivity, and a local environment that grants the freedom to compete and innovate.<sup>55</sup>

Industrial clusters create advantages by bringing firms, suppliers, workers, and logistics together in dense ecosystems. Such co-location increases productivity through shared infrastructure, reduced transaction costs, common labour pools, and continual knowledge spillovers—all of which are essential to industrial competitiveness. A recent success story is Nashik's luggage ecosystem, where Samsonite's facility has emerged as the world's largest by volume, surpassing long-standing European hubs.<sup>56</sup> The company's decision to further expand locally highlights the importance of established regional supply chains and workforce stability. Such examples demonstrate the potential to 'Make in India for India and the world' by evolving regional clusters into high-productivity global manufacturing bases.

<sup>54</sup> <https://tinyurl.com/59bsvvey>.

<sup>55</sup> Inputs from Foundation for Economic Development.

<sup>56</sup> <https://tinyurl.com/yxffdj3w>.

India has also attempted to build industrial clusters through various schemes over the past few decades, from the 1997 Industrial Park Scheme and the 2005 SEZ Act to the National Industrial Corridor Development Programme and sector-specific clusters for electronics, textiles, and software. While India has several organically developed clusters that bolster domestic production, however, transforming these clusters into globally competitive ecosystems requires addressing two key structural factors. First, achieving optimal scale: the median size of India's clusters is relatively small, often lacking the necessary land area and robust multimodal connectivity essential for global value chain integration. Second, enhancing regulatory flexibility: frameworks governing these zones have yet to fully relax key constraints related to labour, building norms, and ease of doing business, which limit their appeal to international firms seeking speed and predictability.

The gap between domestic strength and global competitiveness underscores the need for an upgraded cluster strategy. Strengthening India's global competitiveness requires reimagining the cluster model as a high-productivity, reform-enabled ecosystem. The strategic way forward can be built on three pillars. First, it should prioritise scale and location by strategically identifying and anchoring large, high-potential regions in well-connected brownfield locations, ensuring the necessary scale through clear land titling and modern land pooling mechanisms. Second, an empowered institutional mechanism (like the IFSCA at GIFT City) can be granted the authority to ensure regulatory certainty and flexibility, enabling clusters to operate with globally competitive speed. Third, it should involve harnessing private execution by enhancing the role of private developers to masterplan, build, and operate core infrastructure, ensuring market responsiveness and efficiency. Clusters designed under this framework may have the potential to become India's primary engines of growth, accelerating integration into global value chains and supporting the nation's economic growth and resilience.

8.58. Manufacturing activity in India is expanding beyond metropolitan cities to Tier-2 and Tier-3 cities, which possess advantages such as affordable land, lower real estate and wage costs, and proximity to raw material sources. These cities offer significant potential for job creation, sustained economic growth and improved livelihoods, while also supporting decongestion of large metro cities. Sustained investments in connectivity, industrial infrastructure, skilling and supportive policy frameworks can further facilitate many Tier-2 and Tier-3 cities to emerge as competitive manufacturing centers not just domestically but also globally.

8.59. Case studies from smaller industrial centers of Tier-2 and Tier-3 cities illustrate how these advantages are translating into manufacturing competitiveness. For instance, Hubballi-Dharwad-Belagavi is an emerging cluster for advanced manufacturing.<sup>57</sup> In Belagavi (Karnataka), long-standing foundry and precision-engineering capabilities have evolved into an aerospace-oriented cluster supplying castings and machined components to domestic and global manufacturers, supported by local skills and cluster-

<sup>57</sup> Source: Karnataka Digital Economy Mission: <https://tinyurl.com/4mwjefxt>.

based industrial development. Similarly, with lower operating costs and improved road, rail and air connectivity with wider supply chains - a diversified manufacturing base anchored in steel processing, metal fabrication and consumer durables has been developed at Hubballi–Dharwad.<sup>58</sup> India's industrial future thus is likely to be facilitated by its smaller cities across various states.

## **SCALING UP MSMEs: DEEPENING COMPETITIVENESS, EXPANDING MARKET ACCESS, AND BRIDGING THE CREDIT GAP**

8.60. Micro, Small, and Medium Enterprises (MSMEs) form the backbone of India's industrial economy, accounting for approximately 35.4 per cent of manufacturing, around 48.58 per cent of exports, and 31.1 per cent of GDP in the country.<sup>59</sup> With over 7.47 crore enterprises employing over 32.82 crore persons,<sup>60</sup> the sector holds its position as the second-largest employer after agriculture. Globally, MSMEs make up about 90 per cent of businesses and are responsible for over 50 per cent of the total global employment.<sup>61</sup> With India's manufacturing sector positioned for greater global integration, MSME sector's role is critical in enabling effective supply-chain participation, fostering local value addition, and supporting inclusive regional growth.

8.61. Despite expanding credit footprints and rising digital integration, access to formal credit remains a binding constraint for many micro-enterprises due to limited collateral and documentation readiness, as is generally the case worldwide. This challenge was also highlighted in the World Bank's Financial Sector Assessment Report for India (2025),<sup>62</sup> which noted that 27 per cent of MSMEs identify finance as their biggest obstacle. Women-owned MSMEs, in particular, account for a small fraction of commercial credit, though formalisation under Udyam and targeted credit guidelines are gradually addressing this gap. Furthermore, MSME credit has maintained a positive trajectory in recent times, bolstered by several government interventions aimed at enhancing credit flow to the sector.

8.62. MSME credit remained the primary driver of industrial credit growth during H1FY26. In recent periods, the overall MSME credit growth year-on-year (Y-o-Y)

<sup>58</sup> <https://tinyurl.com/5bmuz77n>.

<sup>59</sup> Source: National Statistical Office, Ministry of Statistics & Programme Implementation for the year 2023-24. Data for exports is sourced from the portal of Directorate General of Commercial Intelligence and Statistics for the year 2024-25

<sup>60</sup> Total employment reported by the MSMEs on the Udyam Registration Portal as on 09.01.2026, <https://tinyurl.com/t557udxr>.

<sup>61</sup> NITI Aayog Report on Enhancing MSMEs Competitiveness in India (2025) available at <https://tinyurl.com/2x443e58>.

<sup>62</sup> World Bank- India Financial Sector Assessment Report (June 2025) <https://tinyurl.com/dv2bsduc>.

has significantly outpaced the Y-o-Y growth observed in large industry credit (Table VIII.3).<sup>63</sup> This acceleration can partly be attributed to policy measures, including the revised MSME classification thresholds implemented in April 2025, which expanded the eligibility for priority sector lending, guidelines enabling jewellery-backed small business loans and targeted Budget schemes. Further, NBFCs continued to play a critical role as last-mile credit providers, maintaining strong double-digit lending growth to MSMEs.<sup>64</sup>

**Table VIII.3: Growth in deployment of gross bank credit to MSMEs (Y-o-Y per cent), select periods**

Segment	March 2024	August 2024	March 2025	August 2025
Micro & Small Enterprises	14.7	13.4	8.8	20.9
Medium Enterprises	13.3	19.2	18.6	13.1
<b>Total MSME Credit</b>	<b>14.3</b>	<b>15.1</b>	<b>11.7</b>	<b>18.5</b>
Large Industry (comparison)	6.4	7.7	6.2	1.8

Source: Monetary Policy Report, RBI Bulletin (October 2025)

8.63. The SME public markets have also witnessed a dramatic expansion over the past two years, driven by buoyant market conditions and digital retail participation. Between 2022–23 and 2024–25, SME IPO listings surged by 87.2 per cent, with the total issue amount growing by 52.7 per cent over the previous year. This boom was characterised by a sharp rise in retail investor participation, facilitated by UPI-based ASBA (Application Supported by Blocked Amount) system, and significant listing gains.<sup>65</sup> While capital-intensive manufacturing dominated issue sizes, the services sector also saw a rise in listings, indicating the SME segment's enhanced role in mobilising capital for growth.

#### Box VIII.10: Maharashtra's Pioneering Defence & Aerospace Venture Fund— A State-Led Innovation Finance Model

Maharashtra launched a pioneering Defence & Aerospace Venture Fund (MDAVF), a registered Category II-Alternative Investment Fund (AIF) worth ₹330 crore<sup>66</sup> in 2018, aimed at catalysing manufacturing capabilities among MSMEs in strategic, high-growth sectors. The Fund, managed by IDBI Capital Markets & Securities, focuses on supporting enterprises engaged in precision engineering, aerospace components, UAV systems, and defence sub-systems. This model blends State capital

<sup>63</sup> RBI Bulletin, October 2025: <https://tinyurl.com/2d59t9vx>.

<sup>64</sup> *ibid.*

<sup>65</sup> Chattopadhyay, B., & Ganguly, S. (2025, October 20). Fundraising by Indian Small and Medium Enterprises through IPO: Recent Trends and Developments. RBI Bulletin, (October 2025) available at <https://tinyurl.com/bdumbhz8>.

<sup>66</sup> <https://tinyurl.com/5n97nfcj>.

with professional fund management to provide crucial early-stage and growth-stage support to MSMEs. The Fund invests in companies through various instruments, including equity or equity-linked investments, convertible instruments, and debentures, to achieve risk-adjusted returns.<sup>67</sup>

The Fund has attracted significant private capital into high-technology MSMEs through co-investment and risk-sharing mechanisms and supported MSMEs in acquiring vital defence certifications, facilitating vendor development processes, and achieving their export readiness. The initiative is explicitly aligned with the national indigenisation priorities outlined under the Defence Production and Export Promotion Policy (DPEPP). It leverages strong linkages to Maharashtra's established industrial corridors and emerging defence clusters.

The Fund has extended capital support to a broad set of MSMEs, with investments spanning missile systems, aerospace technologies, naval platforms, and electronic warfare. It has built a diversified portfolio, including investments across multiple enterprises and selective full and partial exits, reflecting a maturing investment cycle. This Fund demonstrates how State-level innovation finance can accelerate MSME technological capabilities in sunrise sectors. Such funds can indeed accelerate MSME participation in strategic value chains by catalysing private investment, facilitating certification and R&D and anchoring enterprises within emerging industrial corridors.

8.64. To strengthen credit linkages, the Credit Guarantee Scheme (CGS) for Micro and Small Enterprises (MSEs) was revamped, effective from 01 April 2023, following a corpus infusion of ₹9,000 crore in the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE), enhancing the ceiling for guarantee coverage from ₹2 crore to ₹5 crore and reducing the annual guarantee fees to as low as 0.37 per cent. Key enhancements include increasing the extent of guarantee coverage for women-owned MSEs from 85 per cent to 90 per cent. Additionally, effective from 01 April 2025, the government has doubled the ceiling for guarantee coverage from ₹5 crore to ₹10 crore and rationalised the annual guarantee fee for coverage exceeding ₹1 crore.<sup>68</sup>

8.65. The Self-Reliant India (SRI) Fund, launched to infuse ₹50,000 crore as equity funding in MSMEs, has assisted 682 MSMEs by way of investment worth ₹15,442 crore, as of 30 November 2025.<sup>69</sup> Additionally, the Prime Minister's Employment Generation Programme (PMEGP) assists micro-entrepreneurs by providing margin money subsidies on bank loans. The programme has been expanded to include higher project costs and an enhanced scope of activities. Further, to bolster competitiveness, the MSME Champions Scheme promotes "Zero Defect, Zero Effect" practices through ZED Certification and productivity improvements via the MSME Competitive (Lean)

<sup>67</sup> <https://tinyurl.com/2b87ffef>.

<sup>68</sup> Ministry of Micro, Small and Medium Enterprises.

<sup>69</sup> *ibid.*

Scheme. Innovation is also being institutionalised through the MSME-Innovative component, which facilitates incubation, design interventions, and the protection of IPR.

8.66. Operational challenges such as delayed payments affect liquidity, especially for micro-suppliers. With a view to address these challenges, government's noteworthy interventions include expanding TReDS (Trade Receivables Discounting System) ecosystem and digital invoicing with a reduced monetary limit for onboarding on TReDS for Corporates and CPSEs from ₹500 crore to a turnover of ₹250 crore,<sup>70</sup> the rapid progress of the ONDC (Open Network for Digital Commerce) ecosystem and the TEAM (Trade Enablement and Marketing Scheme) Initiative (which aims to assist five lakh MSMEs to onboard the platform)<sup>71</sup> offer a transformative path for MSMEs to integrate into formal e-commerce and supply chains at lower transaction costs.

#### Box VIII.11: Online Dispute Resolution (ODR) for MSMEs: Securing Working Capital

The persistence of delayed payments remains a critical challenge for the MSME sector, with an estimated ₹8.1 lakh crore locked in delayed payments<sup>72</sup>, impacting working capital and restricting growth. When an MSME files a delayed payment case against a buyer, it may strain or even damage the business relationship. Buyers may perceive the filing as an adversarial step and may stop placing new orders or discontinue the partnership altogether. Since MSMEs rely heavily on long-term commercial ties, the fear of losing future business prevent them from pursuing legal option, even when large dues remain pending.

The MSE Scheme on Online Dispute Resolution (ODR) for Delayed Payments, along with the MSME ODR Portal developed under it, introduces a structured process that encourages amicable settlement between seller and buyer before the dispute moves into formal adjudication under the MSMED Act, 2006. This early, dialogue-based resolution mechanism allows MSMEs to recover delayed payments without undermining business relationships.

The portal is designed for accessibility, featuring an end-to-end digital process that is faster and more cost-effective than traditional channels. Its low-cost structure, multi-layered resolution mechanism (combining negotiation, conciliation, and arbitration), and 24X7 availability in multiple languages make dispute resolution economically viable even for very small claims. Ultimately, the ODR initiative enhances trust, promotes contractual discipline, and can directly ease the cash-flow stress that plagues the MSME ecosystem, ensuring greater resilience and competitiveness.

8.67. Overall, the MSME sector is well-positioned to harness the current momentum in the manufacturing sector. In order to continue the momentum, innovative measures

<sup>70</sup> Source: PIB Release available at <https://tinyurl.com/5z3e7z8h>.

<sup>71</sup> Source: PIB Release available at <https://tinyurl.com/5ce9yrp2>.

<sup>72</sup> Inputs from Ministry of Micro, Small and Medium Enterprises (MSMEs).

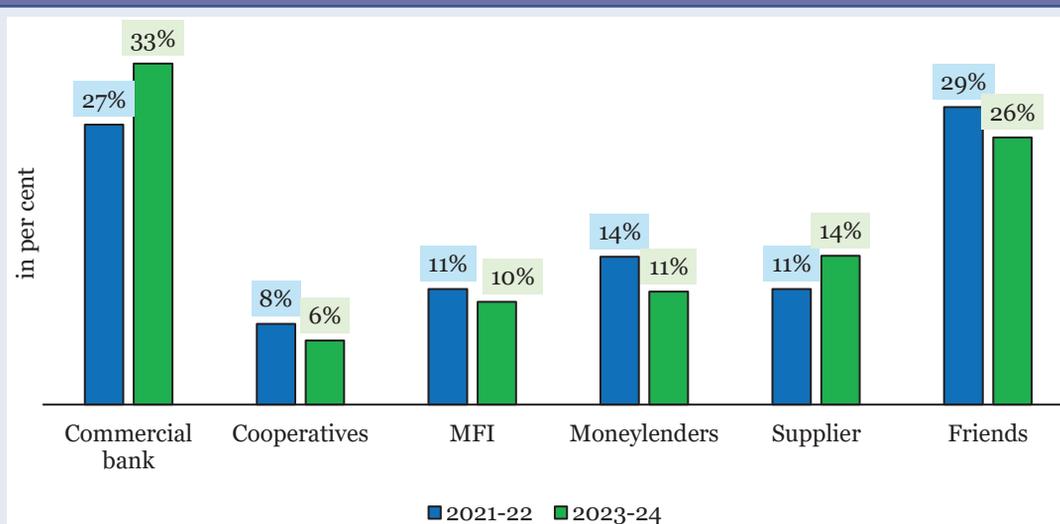
including cash-flow-based lending should be expanded significantly to encourage formal credit access to micro and even first-time borrowers. Further, accelerating digital lending partnerships may also channel timely and affordable finance to a wider base of enterprises.

### Box VIII.12: Strengthening Access to Small-Value Credit– Financing Opportunities for Unincorporated Manufacturing Enterprises

Adequate and timely access to credit continues to be a critical enabler of growth for the unincorporated sector. In recent years, access to finance for unincorporated enterprises has improved considerably. According to the Annual Survey of Unincorporated Sector Enterprises (ASUSE), the average outstanding loan per unincorporated non-agricultural establishment increased from ₹50,138 in 2022–23 to ₹53,710 in 2023–24, reflecting a growth of 7.12 per cent.

This expansion in credit availability has also been accompanied by a gradual shift towards formal financing channels, which is a welcome trend. The share of unincorporated manufacturing establishments accessing formal sources of credit rose from 48 per cent in 2021–22 to 51 per cent in 2023–24. Chart VIII.26 further illustrates this transition, showing a 6-percentage-point increase in borrowing from commercial banks between 2021–22 and 2023–24, alongside a 3-percentage-point decline each in reliance on informal lenders. These developments have been possible due to sustained Government efforts to broaden financial inclusion and strengthen the MSME credit ecosystem. Initiatives such as the Pradhan Mantri Jan Dhan Yojana, credit guarantee frameworks, interest subvention schemes, and the MUDRA Yojana have played a significant role in expanding banking outreach and improving access to formal credit for unincorporated enterprises.

Chart VIII.26: Distribution of establishments by Sources of loan outstanding as on last date of reference period

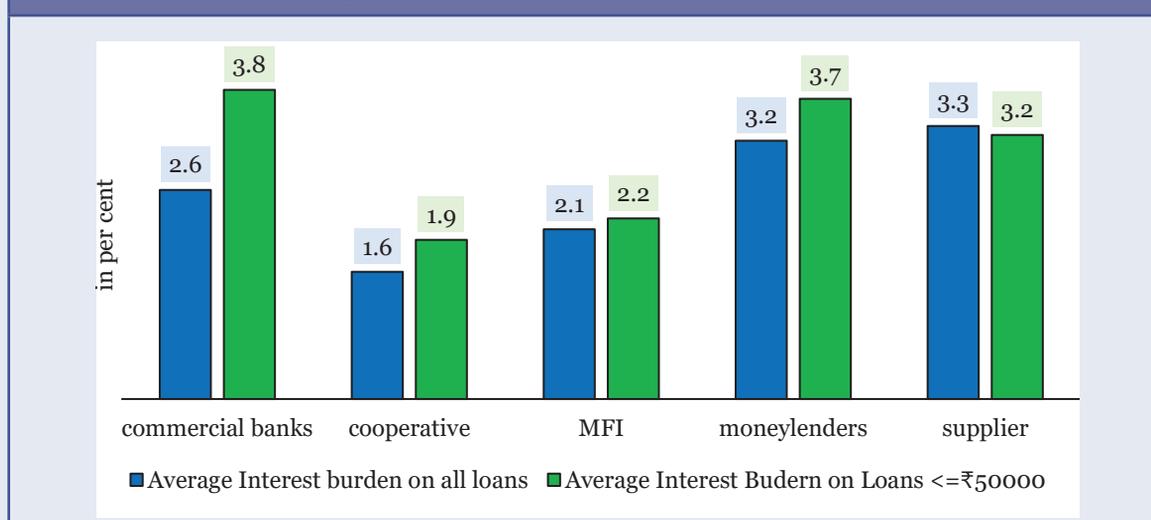


Source: Survey Calculations based on Annual Survey of Unincorporated Sector Enterprises (ASUSE) 2021-22 and 2023-24 Database, MoSPI.

Note: MFI stands for microfinance institution

Further, this shift towards formal sources has also helped reduce the interest burden (measured as interest payable during the reference period as a proportion of outstanding loans) for establishments. As shown in Chart VIII.27, loans obtained from formal institutions typically carry a lower interest burden than those from informal sources. This pattern largely holds true even for small-ticket loans (loan amount less than ₹50,000), except in the case of commercial banks, where the interest burden may be comparable to that of informal lenders, reflecting pricing adjustments for higher perceived risk and lower profitability in such segments. Friends continue to serve as an important financing source owing to strong personal relationships and the availability of low- or zero-interest loans without collateral, particularly for small and urgent funding needs.

**Chart VIII.27: Average interest burden across different sources of finance**

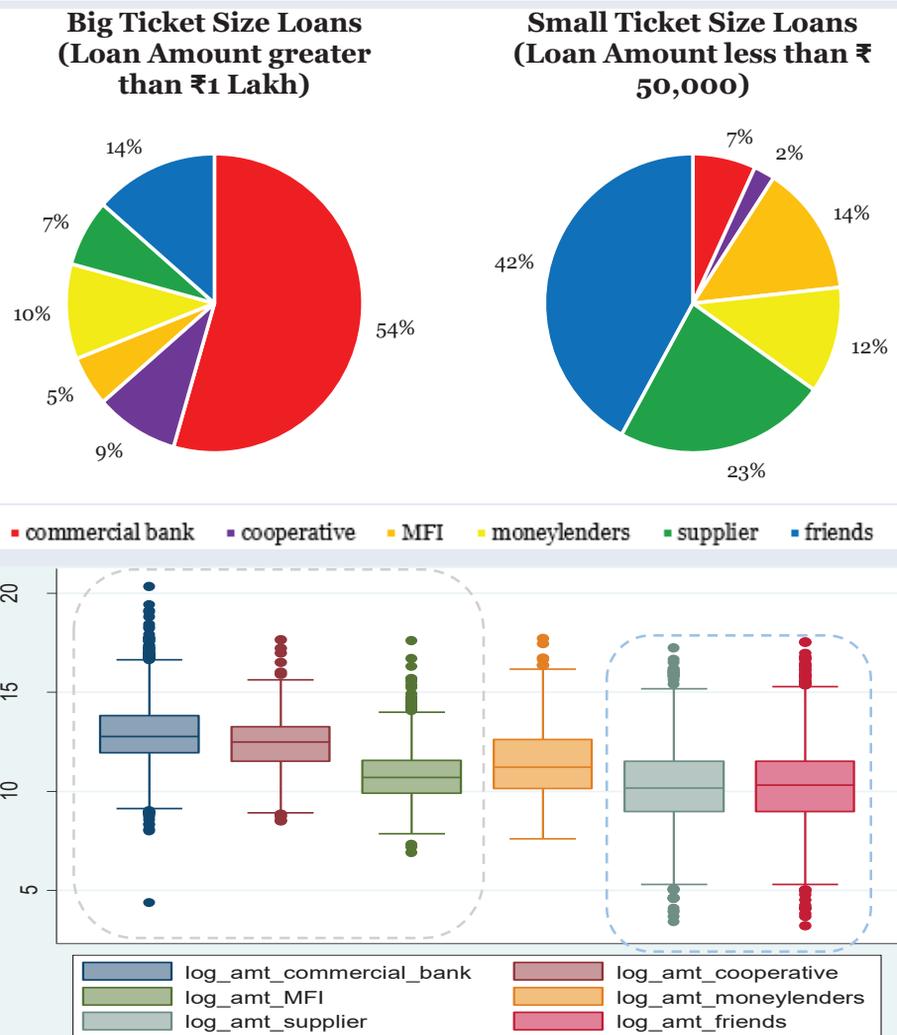


Source: Survey Calculations based on Annual Survey of Unincorporated Sector Enterprises (ASUSE) 2023–24 Database, MoSPI.

Chart VIII.28 offers further insights into opportunities for strengthening access to formal finance. While formal institutions have been effective in reducing dependence on informal channels for moderate- and large-sized loan requirements, there is scope for improvement in the provision of formal finance for small-ticket loans. On the demand side, micro and small enterprises often seek small working-capital loans but face barriers such as limited documentation, weak or thin credit histories, the absence of formal banking relationships, and low levels of financial literacy. On the supply side, formal lenders face disincentives in serving this segment due to low profit margins, high transaction and monitoring costs, heightened risk perceptions, and credit products that are often not tailored to the operational needs of these enterprises. Consequently, enterprises continue to rely on informal sources despite their relatively higher costs.<sup>73</sup>

<sup>73</sup> International Finance Corporation (IFC) Report on Financing India's MSMEs: Estimation of Debt Requirement of MSMEs in India, November 2018, available at <https://tinyurl.com/nhp86mp4>.

**Chart VIII.28: Distribution of Amount of Loan Outstanding by sources of financing (in per cent)**



Source: Survey Calculations based on Annual Survey of Unincorporated Sector Enterprises (ASUSE) 2023–24 Database, MoSPI.

Recognising the distinct credit requirements of unincorporated enterprises, the Government has already initiated several interventions such as Credit Guarantee Schemes for MSMEs,<sup>74</sup> treatment of bank loans disbursed to MFI under priority sector lending (PSL),<sup>75</sup> creation of special category of NBFC-MFI (non-deposit taking NBFC which has a minimum of 75 per cent of its total assets deployed towards microfinance loans)<sup>76</sup> and PSL guidelines, which mandate a sub-target of 7.5 per cent of banks' adjusted net bank credit for micro enterprises.<sup>77</sup>

74 Ministry of Micro, Small & Medium Enterprises, "Credit Guarantee Scheme for Micro & Small Enterprises: Scheme Guidelines," available at <https://tinyurl.com/msc7439y>.

75 Reserve Bank of India (RBI), Master Directions – Priority Sector Lending – Targets and Classification, 2025, FIDD.CO.PSD.BC.13/04.09.001/2024-25 (March 24 2025), available at <https://tinyurl.com/3b2a3s4v>.

76 RBI, <https://tinyurl.com/kb388s9m>

77 RBI, Priority Sector Lending – Targets and Classification, RBI/2014-15/573, FIDD.CO.Plan.BC.54/04.09.01/2014-15 (April 23, 2015), available at <https://tinyurl.com/p5ef8yzk>.

## INTEGRATING WITH GLOBAL VALUE CHAINS

8.68. India accounted for an estimated 2.9 per cent of the global manufacturing GVA<sup>78</sup> and 1.8 per cent of global merchandise exports in 2024,<sup>79</sup> indicating considerable potential for expanding its global manufacturing footprint. The limited share can be attributed to relatively low participation in GVC trade, particularly on the backward-linked side, where firms import intermediates and components to assemble for export.

8.69. This trend calls for reviewing our policy approach: should India prioritise deepening domestic sourcing or focus on integrating more actively with international production networks? Research supports the latter for a labour-rich economy like India. While greater integration into GVCs, especially through backward participation (importing inputs), initially raises the share of Foreign Value Added (FVA), it generates significantly higher absolute Domestic Value-Added (DVA) and employment in the medium term due to scale effects (Grossman & Rossi-Hansberg, 2008). For a labour-rich economy, export-oriented GVC participation can be a powerful mechanism for employment generation in higher-productivity manufacturing.

8.70. Recent geopolitical realignments and global supply-chain restructuring can also create opportunities for labour-abundant economies to position themselves as competitive assembly and manufacturing hubs in GVCs. In this context, higher import tariffs on intermediates and capital goods relative to final products can lead to inverted duty structures, which raise input costs for domestic manufacturers and discourage assembly and component manufacturing. A renewed and sustained focus on input tariff neutrality may therefore help realise the potential in this window. Towards this end, recent budgets have already initiated correction of inverted duty structures, particularly in several core manufacturing sectors, contributing to a more neutral tariff environment. Going forward, continued calibration of tariffs on intermediates and capital goods—especially in high-growth sectors—can enhance cost competitiveness, deepen assembly and component ecosystems, and support India's emergence as a preferred global production base.

### Box VIII.13: Backward GVC participation and Domestic Value Addition: Evidence from India and Vietnam

GVC integration occurs through two principal channels: (i) backward linkages, wherein firms import intermediate inputs for processing and export of final goods, and (ii) forward linkages, where domestically produced inputs are exported for further processing abroad. For late-industrialising economies, empirical literature suggests that backward GVC participation often generates relatively larger early-stage gains, by facilitating entry into

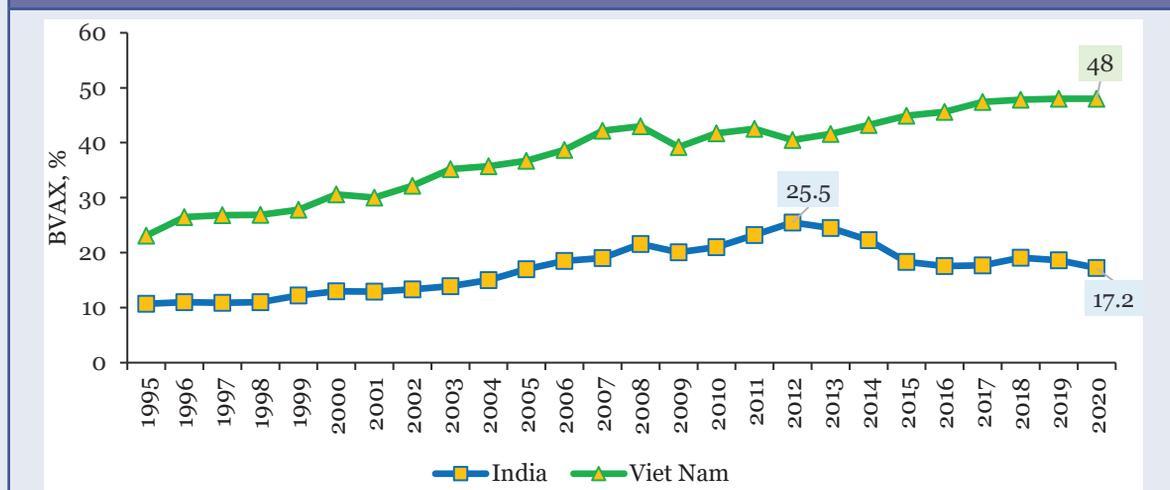
<sup>78</sup> Based on World Bank data on Manufacturing Value Added (current US\$) (2024) available at <https://tinyurl.com/5ad3mkt2>.

<sup>79</sup> Based on WTO data (2024) available at <https://tinyurl.com/39d6j6ta>.

assembly-based activities, enabling rapid scale expansion, and supporting employment growth in labour-intensive segments of production (Veeramani & Dhir, 2022).<sup>80</sup>

In the period following trade liberalisation in the 1990s, India experienced a notable increase in backward GVC integration. The BVAX ratio<sup>81</sup> — measured as the share of foreign value added in gross exports — rose from 10.7 per cent in 1995 to 25.5 per cent in 2012, before moderating to 17.2 per cent in 2020. Over a comparable period, Vietnam’s BVAX ratio increased more sharply, reaching close to 48 per cent, underpinned by sustained tariff liberalisation, an explicitly export-oriented industrial policy, and deeper integration into global production networks.<sup>82</sup>

**Chart VIII.29: Backward GVC Participation – BVAX (as per cent of Gross Exports), India and Vietnam**



Source: OECD-TiVA database.

Cross-country and sectoral evidence indicates that higher backward participation can contribute to increases in total domestic value added (DVA), even when the domestic share per unit of export remains modest in the initial stages. In electronics, for example, Vietnam’s BVAX in 2020 was approximately 49.8 per cent — nearly twice India’s 25.4 per cent — yet Vietnam generated greater absolute DVA and export value, reflecting the role of scale effects in amplifying domestic value creation. Similar patterns are observed in textiles and related sectors, where Vietnam’s stronger GVC integration has been associated with significantly higher export volumes.

These trends suggest that, when supported by competitive input tariffs, efficient logistics and customs processes, predictable regulatory regimes, and an investment-conducive ecosystem, backward-linked GVC integration can function as an important pathway for export growth, employment generation, and gradual strengthening of domestic productive capabilities.

80 Veeramani, C., Dhir, G. Do developing countries gain by participating in global value chains? Evidence from India. *Rev World Econ* 158, 1011–1042 (2022).

81 Backward participation, often measured by BVAX (foreign value added as a share of exports), captures how much imported content is used in a country’s exports

82 Veeramani, C., Centre for Development Studies.

For India, a calibrated deepening of participation in global supply chains — particularly in labour-intensive and assembly-linked sectors — represents a potential avenue for advancing job-rich industrialisation within the broader Viksit Bharat@2047 growth trajectory.

#### Box VIII.14: Why Advanced Manufacturing Matters for India

Advanced manufacturing strategy based on R&D intensive, innovative technology to improve and enhance competitiveness, can contribute not only as a driver of growth, but as a comprehensive ecosystem for enforcing systemic discipline at scale, in a big and late-industrialising economy such as India. Full exposure to global competition, uncompromising quality standards along with thin margins with dynamic delivery standards, significantly limits the scope for regulatory discretion or political access. It would thus encourage manufacturing sector automatically to strictly avoid any compromise on productivity, reliability, and scale. This distinguishes advanced manufacturing from other growth pathways that may raise output without altering firm behaviour. This is also very much in line with India's manufacturing policy based on strategic, selective, and mission-driven, rather than neutral, passive, or purely incentive-based.

The integration of advanced manufacturing with logistics, power, ports, standards, and skills ensures that any institutional weaknesses or deviation quickly and invariably translate into huge economic costs – compelling both the industry or regulator/government to strengthen the weakness or to incur losses or face consequences of poor execution. International experience from Germany, Japan, and South Korea shows that sustained engagement in advanced manufacturing exports has supported both firm-level upgradation and improvements in state capacity.

While not sufficient for inclusive growth and not without risks, it has been observed that the advanced manufacturing remains the pathway that disciplines firms, constrains discretion, and compels governance upgradation at the system level. Other growth drivers—such as infrastructure, capital markets, digital governance, and services exports—can raise incomes, but function best as complements rather than substitutes. Advanced manufacturing matters not because it is aspirational, but because its unforgiving nature forces capability and efficiency at scale on a sustained basis. India's national manufacturing mission strategy in the context of economic development, geopolitical uncertainty, technological disruption, and strategic autonomy can thus accommodate the advanced manufacturing without any frictions.

## CONCLUSION: A ROADMAP FOR THE NEXT LEAP

8.71. India's industrial sector continues to display strong momentum despite an evolving and challenging global environment, supported by reforms in infrastructure, logistics, ease of doing business and innovation systems. The rise of medium and high-technology manufacturing, growing traction under PLI schemes, and improving business sentiment point to a strengthening production ecosystem. Domestic

fundraising and credit access have diversified, corporate balance sheets are healthier, and MSMEs are increasingly being integrated into formal supply chains, also through digital platforms and cluster development. India's industrial path is unfolding at a time when the global economy is marked by supply-chain realignments, near-shoring and friend-shoring impulses, and a more fragmented global order. As highlighted in the Economic Survey 2024–25, India must rely more on domestic engines of growth, and this moment represents an inflexion point.

8.72. The next phase of industrialisation will require a calibrated shift from a model centred mainly on import substitution towards one focused on scale, competitiveness, innovation and deeper integration into GVCs. Rather than seeking complete self-reliance in every segment, India needs to build strategic resilience through diversification and creating depth of capabilities. This requires an increase in private sector investment in R&D, technology adoption, skills, and quality systems. MSMEs will be crucial in this journey, evolving from micro-scale production toward deeper participation in formal and export-linked supply chains [See Box VIII.15].

#### **Box VIII.15: Innovation for Strategic Resilience and Indispensability**

The global economy has transitioned from an era of efficiency-driven globalisation to one defined by strategic resilience and technological sovereignty. In this landscape, the ability to innovate is no longer merely a driver of productivity; it has become the primary currency of national security and geopolitical leverage.

Despite being the world's fourth-largest economy, India's Gross Expenditure on R&D remains stagnant at ~0.64 per cent of GDP, significantly trailing the 2.5 per cent–5 per cent range of innovation-led economies like the US, China, and Israel. The deficiency in India is not a lack of scientific talent but challenges in collaboration with the private sector and 'translation' at scale.

India excels at Technology Readiness Level (TRL) 1-3, but an industrial economy needs TRL 7-9 products. The intermediate stage - prototyping, piloting, and characterisation - constitutes the stage at which Indian innovation appears to stagnate. To secure a position of leverage in global supply chains, India must continue to work towards bridging the critical gap between academic discovery and industrial commercialisation. Innovation reforms in India must be holistic and systemic, addressing not only research funding but also translation, adoption, and scale.

A critical diagnosis of the Indian ecosystem reveals a persistent market failure where the Indian private sector, historically risk-averse and comfortable with technology licensing or import, has failed to step up as the primary engine of R&D. In this context, the announcement of ₹1 lakh crore RDI Scheme and its operationalization by the Hon'ble Prime Minister in November 2025, reflects a sincere commitment from GOI to collaborate with and incentivize the private sector to undertake innovation and help catapult India towards the frontiers of research, development and innovation.

As we undertake this policy effort to place innovation as a core anchor for India's journey going forward, there is a case for examining the need to complement the approach through the creation of Translational Research Centres (TRCs) that serve as shared national assets for piloting and prototyping. TRCs can be viewed as essential national infrastructure, comparable to physical and digital public infrastructure, and can help reduce the cost and risk of testing, validating, and scaling new technologies for start-ups, MSMEs, industry, and academic institutions. By being built and managed as long-term national assets rather than short-term projects, these centres can provide shared access, continuity, and lasting impact across multiple technology cycles. The ANRF architecture can be leveraged for the identification, establishment, and governance of such TRCs as critical national infrastructure.

The effectiveness of India's innovation reforms depends on adopting a balanced, system-wide approach across the science and technology ecosystem, supported by robust governance frameworks, clear performance metrics, and transparent delivery and accountability mechanisms. In this context, it is essential that the ANRF and the RDI Scheme operate in close coordination to align demand signals, research priorities, institutional incentives, standards-setting, and public procurement. Such alignment will enable the creation of a coherent and integrated national research-to-deployment pipeline, ensuring efficient translation of research outcomes into scalable and deployable technologies.

The data from ASPI's critical technology tracker is a wake-up call – the global technology landscape is bifurcating, and India cannot afford to be a client state. Global capital flows are increasingly gravitating along 'geopolitical faultlines.' Countries that control critical nodes – such as semiconductors, advanced materials, and APIs—possess 'reverse leverage.'

If India fails to ignite this innovation engine, the risks would be long-lasting. India risks remaining a 'service provider' to the developed world, vulnerable to technology denial regimes and supply chain shocks. Conversely, India can choose to work towards the following objective: defensive sovereignty (preventing supply shocks) and offensive leverage (becoming indispensable in high-tech domains). A firm choice shall have to be made.

8.73. As India considers its manufacturing strategy amid economic transformation, geopolitical uncertainty and rapid technological change, manufacturing capacity needs to be viewed as a strategic national asset. It is central to employment, productivity, technological learning, exports and strategic resilience, and therefore warrants a mission-oriented approach beyond purely incentive-based interventions. In this context, government interventions may be considered even in the absence of immediate cost competitiveness for select sectors and technologies of national interest. Policy design can also benefit from treating industrial clusters, rather than standalone firms, as the unit of competition by integrating anchor firms, MSMEs, suppliers, skills, logistics and R&D, with an emphasis on ecosystem depth.

8.74. Sequenced capability building is also critical for strengthening manufacturing competitiveness. This involves supporting progression from assembly to components,

systems and design- or IP-intensive activities through sector-specific capability ladders with time-bound milestones for localisation and value addition. Export performance can serve as an important test of competitiveness, with supported sectors transitioning from import substitution towards exports over defined timelines. While innovative experimentation and learning should be encouraged, persistent stagnation or continued support without capability growth should be avoided. Within this framework, the role of the State extends beyond facilitation to that of strategist, coordinator, risk absorber and capability builder, operating within a federal structure that encourages States also to act as co-owners of national manufacturing priorities aligned with local strengths.

8.75. Strengthening the enabling ecosystem will also be key. Continued tariff rationalisation, especially for intermediates and capital goods, can enhance cost competitiveness and deepen GVC integration. Modern logistics infrastructure, under the PM GatiShakti initiative, regulatory simplification, and a focused industrial cluster strategy—anchored in scale, supplier depth, skills, and shared infrastructure—will be vital for expanding manufacturing beyond existing enclaves,—especially in Tier-2 and Tier-3 cities. The innovation push under ANRF and the RDI Fund, coupled with a future-ready workforce in semiconductors, EVs, green tech and advanced materials, will support technological upgradation. In this context, advanced manufacturing can play a critical role in raising productivity, strengthening export competitiveness and enforcing discipline across firms and create a revamped and robust manufacturing ecosystem.

8.76. Ultimately, a strong industrial sector is a strategic imperative for India. With sustained reform momentum, investment in innovation and human capital, and dynamic private sector participation, the industrial sector can emerge as a central pillar and contribute even more significantly in the journey towards Viksit Bharat@2047.

\*\*\*

*This page has been left blank*

# INVESTMENT AND INFRASTRUCTURE: STRENGTHENING CONNECTIVITY, CAPACITY AND COMPETITIVENESS



*Infrastructure continues to be central to India's growth strategy, with public capital expenditure following a sustained upward trajectory since FY15 and gaining further momentum in recent years. Large-scale investments across roads, railways, ports, power, aviation and digital infrastructure have strengthened connectivity, expanded capacity and improved logistics efficiency, generating strong multiplier effects for growth and productivity. This phase has been characterised not only by rapid asset creation but also by a shift towards integrated, system-level development.*

*A defining feature of this transition has been the institutionalisation of multimodal planning through PM GatiShakti, complemented by the National Logistics Policy and digital platforms that are reducing transaction costs and execution risks. Reforms in infrastructure financing—spanning project finance regulation, Public-Private Partnership (PPP) frameworks, asset monetisation and capital market instruments—are crowding-in private investment. At the same time, India's infrastructure base is broadening to include digital public infrastructure (DPI), clean energy, resilient water systems and emerging sectors. Sustaining investment momentum while aligning infrastructure with efficiency, sustainability and competitiveness will continue to remain key towards supporting India's medium-term growth and its long-term vision of Viksit Bharat @2047.*

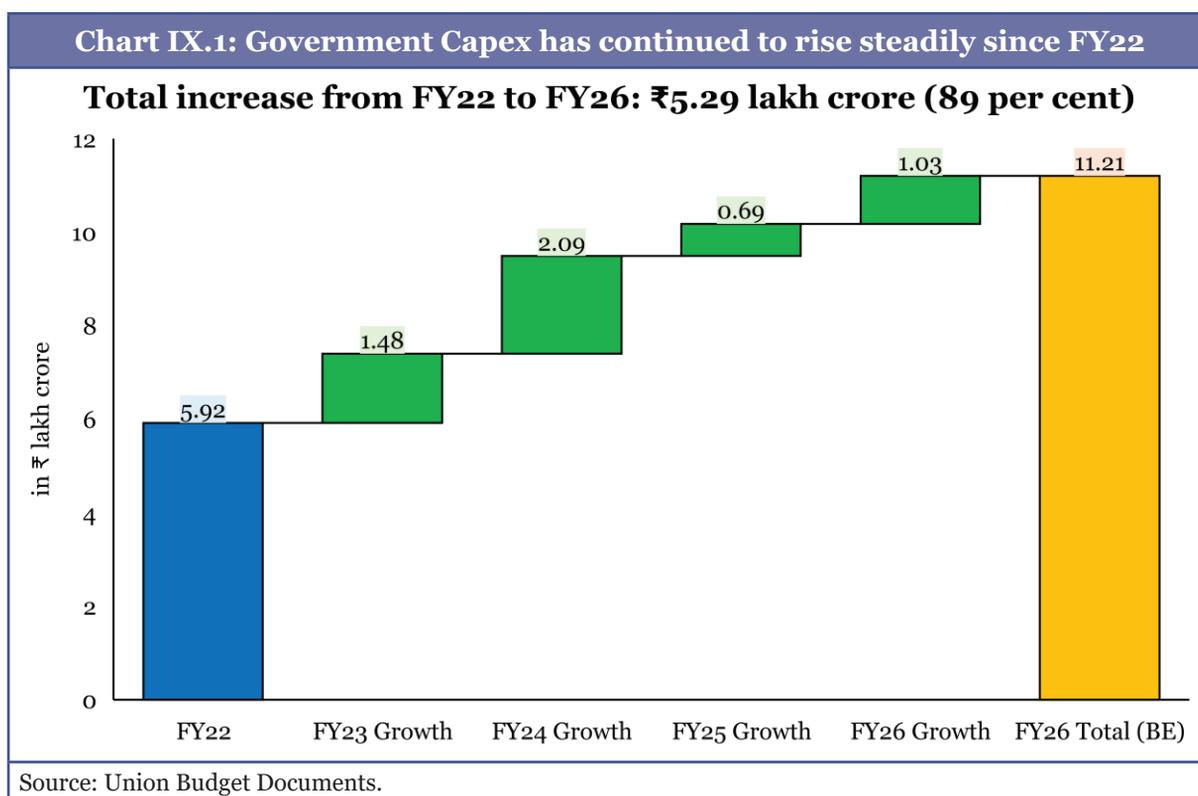
## INTRODUCTION: INFRASTRUCTURE AS THE ENGINE OF GROWTH

9.1 The decisive role of infrastructure investment in India's growth strategy has been a defining feature in recent years. Union Budget priorities since FY20 reflect a sustained shift toward large-scale public capital expenditure, supported by integrated planning, and the systemic modernisation of logistics and connectivity networks.

9.2 This period has been marked not just by the accelerated expansion of traditional infrastructure, such as highways, railways, ports, and energy systems, but also by the expansion of digital public infrastructure (DPI), data systems, and assets aligned with renewable energy. Together, these developments signal a shift in how India plans and finances infrastructure projects, moving beyond mere capacity addition to focusing on enhancing efficiency, competitiveness and network integration.

9.3 A major element of this shift has been the substantial increase in public capital expenditure. Between FY19 and FY22, the Government of India's capital expenditure increased by 92 per cent, from ₹3.07 lakh crore to ₹5.92 lakh crore. This momentum has been sustained over the subsequent fiscal years, reinforcing the objective of expanding access to quality infrastructure across the country.

9.4 The Government of India's capital outlay has increased by nearly 89 per cent, from ₹5.92 lakh crore in FY22 to a budgeted allocation of ₹11.21 lakh crore for FY26, recognising the strong multiplier effects that infrastructure generates on the economy. Public expenditure on infrastructure has a high multiplier effect, estimated by studies to be around 2.5 to 3.5 times the GDP over the medium term.<sup>1</sup> This means, for every rupee spent by the government in creating infrastructure, GDP gains worth ₹2.5-₹3.5 accrue.<sup>2</sup> The scale and consistency of this investment momentum have positioned infrastructure as a cornerstone of India's growth engine.



9.5 This investment push has been paired with major institutional and technological reforms designed to enhance planning quality and reduce execution risks also through private participation. The PM GatiShakti National Master Plan, launched in 2021, has successfully institutionalised multimodal, GIS-enabled planning. The recent launch of PM GatiShakti Public has further democratised the platform, providing regulated

1 Fiscal Multipliers for India (by Sukanya Bose & N. R. Bhanumurthy, NIPFP, 2013) <https://tinyurl.com/4972rumk>.

2 Speeding up with Gati Shakti (October 2021), NITI Aayog, available at <https://www.niti.gov.in/speeding-gati-shakti>.

access to geospatial data for private developers and researchers to leverage advanced analytics for infrastructure planning and investment decisions.<sup>3</sup>

9.6 Complementary initiatives under the National Logistics Policy (NLP) have supported the emergence of a more predictable and digitised logistics environment. The use of the Unified Logistics Interface Platform (ULIP) and the insights drawn from the Logistics Ease Across Different States (LEADS) framework are actively improving logistics efficiency, which directly affects the competitiveness of India's manufacturing sector. A detailed analysis of the impact of the PM GatiShakti framework, the National Logistics Policy, and other initiatives aimed at reducing logistics costs and improving competitiveness is presented in the Infrastructure and Logistics section in Chapter 8 on Industry.

9.7 Beyond physical assets, DPI acts as an essential force multiplier across the economy. The expansion of BharatNet, the deployment of 5G networks, and the continued growth of platforms like Unified Payments Interface (UPI) and Aadhaar, ULIP, DigiYatra, FASTag, form the essential digital backbone upon which smart, efficient, and inclusive infrastructure services are delivered at scale.

9.8 Overall, infrastructure remains a key lever for sustaining medium-term growth through (i) continued public capex and improved project planning and execution, (ii) crowding-in of private investment through a stronger Public-Private Partnership (PPP) pipeline, (iii) deeper and more resilient long-term financing via capital markets and prudentially sound bank/NBFC credit.

9.9 While public capital expenditure on infrastructure has expanded significantly in recent years, its effectiveness increasingly depends on the quality of project planning, prioritisation and execution. Evidence from various studies suggests that time and cost overruns in large infrastructure projects are often linked to gaps in upstream project preparation, including weak feasibility assessments, incomplete Detailed Project Reports (DPRs), rigid procurement practices, and delays in dispute resolution. Strengthening institutional capacity across the project lifecycle, including improved project preparation, lifecycle-based costing, standardised contracts, faster dispute resolution, wider adoption of technology, and skill development are critical to delivering infrastructure faster, at scale, and within budget.

9.10 The subsequent sections of this chapter discuss measures to enhance infrastructure financing and provide a detailed review of progress, outlook, and challenges across key infrastructure sub-sectors, including core physical infrastructure, energy sector, digital infrastructure, rural infrastructure and emerging

---

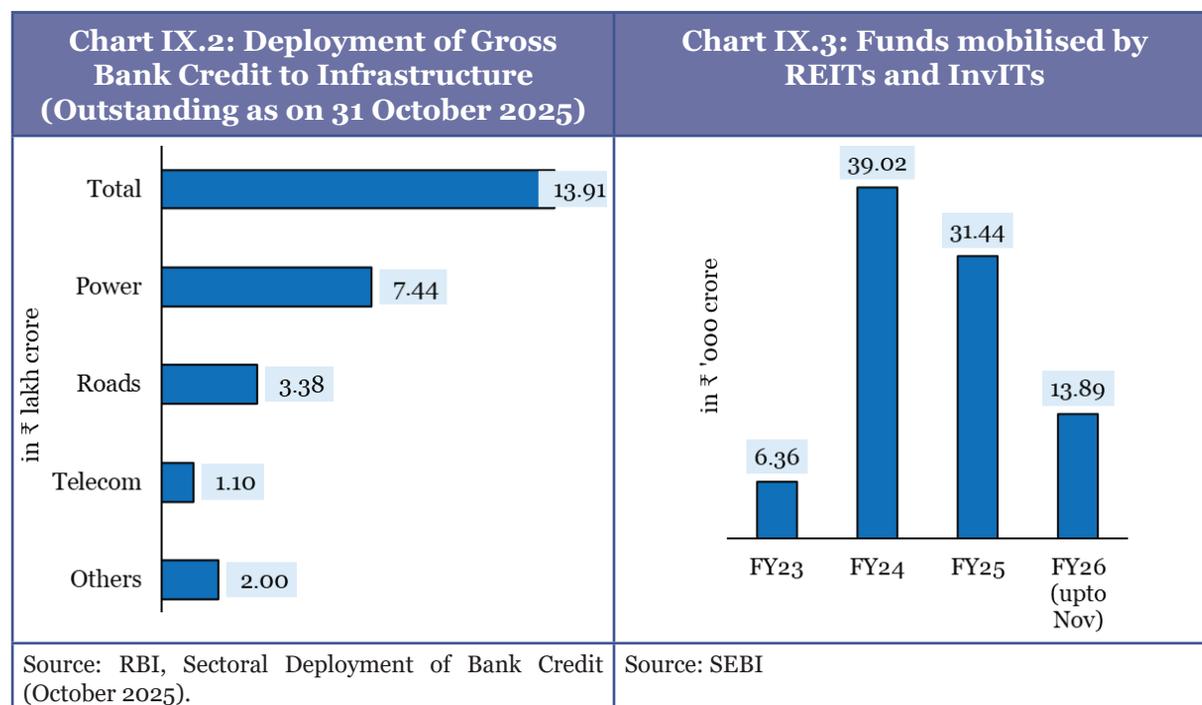
<sup>3</sup> PIB Release available at <https://tinyurl.com/nm83nmw7>.

sectors infrastructure. Discussions pertaining to urban infrastructure and social infrastructures, such as health and education, are covered separately in Chapters 15 and 11, respectively.

## ENHANCING INFRASTRUCTURE FINANCING AND PRIVATE PARTICIPATION

9.11 India's infrastructure financing landscape is undergoing a change and shifting from a historical dependence on bank credit toward a diversified ecosystem of alternative financing vehicles and capital market instruments. While bank credit to the infrastructure sector recorded a year-on-year (YoY) growth of 4.6 per cent in October 2025, recovering from 2.3 per cent YoY growth in October 2024, the incremental expansion of financing is increasingly being driven by non-bank channels.

9.12 Credit flows from non-bank financial companies (NBFCs) (net of bank borrowings), to the commercial sector grew at a robust compound annual growth rate (CAGR) of 43.3 per cent during FY20 to FY25, significantly outpacing the 25 per cent CAGR recorded for non-food bank credit over the same period.<sup>4</sup> This evolving landscape has been further strengthened by the growing role of Infrastructure Investment Trusts (InvITs) and Real Estate Investment Trusts (REITs), which are enabling long-term institutional capital to participate in infrastructure assets (Chart IX.3). Together, these developments are helping to mitigate systemic risks by reducing asset–liability mismatches on bank balance sheets, while enhancing the sustainability of financing for long-gestation infrastructure projects.



4 RBI Handbook of Statistics on the Indian Economy 2024-25, Table 63 (Statistical table on Flow of Resources to Commercial Sector in India)

9.13 A major regulatory milestone in infrastructure credit is the RBI (Project Finance) Directions 2025, effective from 01 October 2025. These guidelines introduce a unified framework for project lending across all financial institutions, ensuring a consistent approach to large-scale financing. A key feature of these directions is the revised treatment of the Date of Commencement of Commercial Operations (DCCO). This provides a more realistic way to handle project delays, which helps in better identifying actual stress and preventing the artificial ‘evergreening’ of loans. Furthermore, by aligning the definition of the ‘Infrastructure Sector’ with the government’s Harmonised Master List (HML) of infrastructure sub-sectors, the RBI has ensured regulatory clarity and policy synchronisation across the entire financial ecosystem.

9.14 Capital-market channels for long-term funding and asset recycling have also been strengthened through incremental reforms. SEBI’s Small and Medium Real Estate Investment Trusts (SM REIT) framework reduced the minimum asset size relative to existing REITs, from ₹500 crore to ₹50 crore. It also introduced a scheme-based structure, allowing multiple schemes to be managed under one SM REIT. Each scheme’s proposed assets are generally required to be at least ₹50 crore and less than ₹500 crore. This broadens the universe of monetizable real estate assets and can support urban regeneration/commercial infrastructure by bringing smaller, stabilised assets into a regulated pooled vehicle.

9.15 Additionally, SEBI has decided that from 01 January 2026, investments by Mutual Funds and Specialised Investment Funds (SIFs) in REITs will be treated as equity-related instruments, which is expected to ease participation constraints and potentially improve secondary market liquidity. From April to November 2025, ₹13,893 crore was raised by listed Real Estate Investment Trusts (REITs) and Infrastructure Investment Trusts (InvITs).<sup>5</sup>

## Public-Private Partnerships

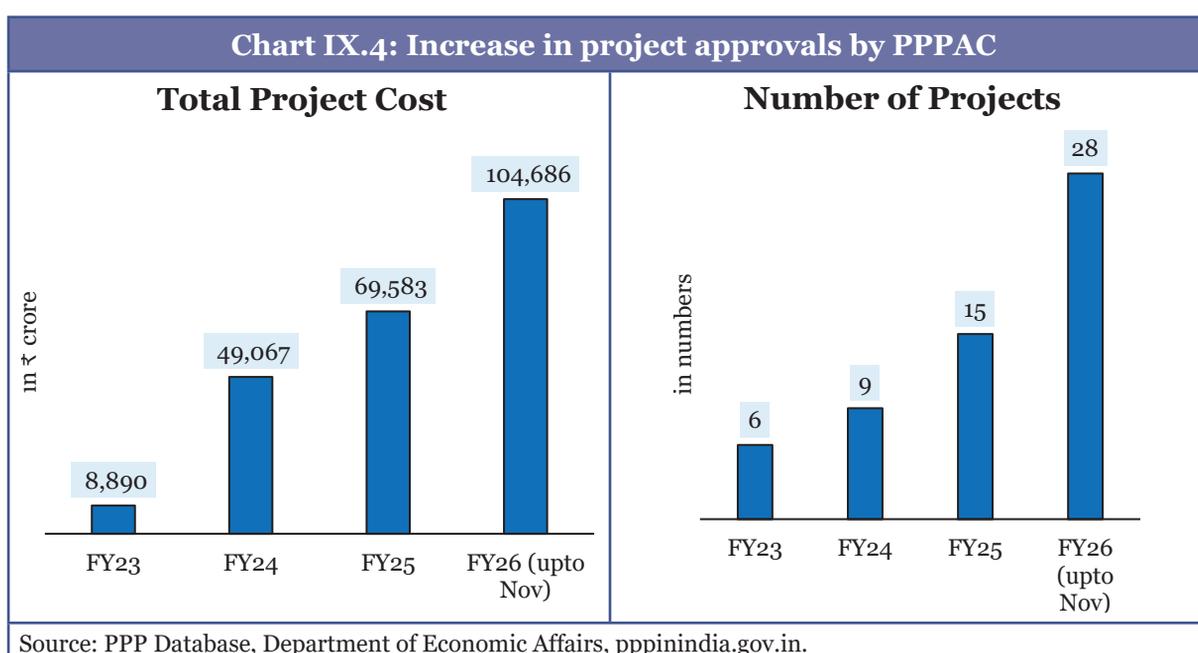
9.16 PPPs are vital mechanisms through which governments can leverage private sector expertise and resources to address critical infrastructure needs. They play a significant role in bridging infrastructure gaps and enhancing the efficiency of service delivery. The success of PPPs is largely dependent on the robustness of institutional frameworks, financial support, and the adoption of standardised documents, such as the Model Request for Qualification (RfQ), Model Request for Proposal (RfP), and Model Concession Agreements (MCAs).

9.17 India’s infrastructure programs support a variety of PPP models, including

<sup>5</sup> SEBI statistics on fund raising by REITs and InvITs available at <https://tinyurl.com/57u2rjtb>. Note: Total funds mobilised by REITs & InvITs includes funds raised through public issue, private placement, preferential issue, institutional placement, rights issue.

management contracts like Build-Operate-Transfer (BOT), Design-Build-Finance-Operate-Transfer (DBFOT), Hybrid Annuity Model (HAM), and Toll-Operate-Transfer (TOT). Within the BOT framework, two variants exist—BOT (Toll) and BOT (Annuity)—distinguished by the allocation of traffic risk.

9.18 According to the World Bank’s Private Participation in Infrastructure (PPI) Report 2024,<sup>6</sup> India has consistently ranked among the top five countries globally in terms of private investment in infrastructure among low- and middle-income economies. India also emerged as the largest recipient of PPI investment in South Asia, accounting for over 90 per cent of the region’s total private infrastructure investment. This strong global standing is reflected domestically in the marked increase in project approvals by the Public-Private Partnership Appraisal Committee (PPPAC), as illustrated in Chart IX.4. The key institutional and policy mechanisms underpinning India’s PPP framework are discussed in Box IX.1, while the priorities shaping its next phase are outlined in Box IX.2



### Box IX.1: Key Institutional Mechanisms to support PPPs in India

#### Public Private Partnership Appraisal Committee (PPPAC):

- Apex body for appraising and recommending central sector PPP projects. Chaired by the Secretary, Department of Economic Affairs (DEA), its members include Secretaries from the Department of Expenditure, Department of Legal Affairs, the sponsoring ministry/department, and the CEO of NITI Aayog.

<sup>6</sup> Private Participation in Infrastructure (PPI) Annual Report (2024), World Bank available at <https://tinyurl.com/muywbmcb>.

- 129 projects with a Total Project Cost (TPC) of ₹5,60,965.71 crore have been recommended by the PPPAC [From 2014-15 to 2025-26 (up to 04 December 2025)].

#### **Viability Gap Funding (VGF) Scheme:**

- Provides financial assistance to projects that are economically desirable but commercially unviable.
- Economic sector projects may receive up to 40 per cent of capital expenditure (Capex) as a VGF grant, while social sector projects are eligible for grant up to 80 per cent of Capex and 50 per cent of operational expenditure for five years post-commercial operations.
- 72 projects have been approved, with a GoI VGF of ₹7,941.838 crore sanctioned (up to 04 December 2025). Out of this, ₹6,314.86 crore has already been disbursed.

#### **India Infrastructure Project Development Fund (IIPDF):**

- Aims to create a pipeline of viable, bankable projects by funding transaction advisers for central and state authorities.
- Notified in November 2022 with a total outlay of ₹150 crore for three years from FY23 to FY25.

#### **Development of a Three-Year PPP Project Pipeline:**

- Pursuant to the announcement in the Union Budget 2025-26, a 3-year PPP project pipeline has been created.
- The PPP project pipeline comprises 852 projects across central infrastructure ministries and States/Union Territories with a combined total project cost of over ₹17 lakh crore.

#### **Standardisation and Institutional Capacity Building:**

- Development of reference guides on risk allocation, PPP appraisal, and project implementation mode (Waterfall Framework) including sector-specific PPP structuring toolkits for Roads, Ports, Solid Waste Management, and Water & Sanitation have been done.
- Capacity Building Initiatives for States/UTs through workshops, seminars, and one-to-one guidance are ongoing.
- National Infrastructure Enablement Index (NIEI) has been developed to assess the institutional preparedness of States/UTs and Central Ministries/Departments.
- Model RfP (Request for Proposal) for single-stage PPP projects has been developed to embed best practices, ensure consistency, and enhance flexibility in procurement and contract management.

### Box IX.2: Public–Private Partnerships (PPP)- Strengthening the Partnership Paradigm

India’s PPP programme has traversed a full learning curve since the first wave of projects in the early 2000s. In the initial phase, multiple PPP models were tested across sectors, with some projects encountering stress or failure. These experiences informed successive improvements in model concession agreements, policy guidelines, and institutional practices by addressing contractual weaknesses, risk-allocation errors, and regulatory gaps. Over time, this iterative process has converted early experimentation into codified frameworks and institutional memory.

As a result, the environment for private participation in infrastructure is materially stronger in select core sectors. Roads, ports, power, and renewable energy now attract sustained private capital, supported by more stable policy regimes, standardised contracts, and clearer regulatory architectures. These sectors have transitioned from infancy to relative maturity through deliberate sequencing of reforms. For instance, tariff regulation in ports was initially institutionalised through the Tariff Authority for Major Ports (TAMP) and subsequently withdrawn as market depth and competition improved, underscoring the need for regulation to evolve with sector maturity.

The next challenge is to extend this maturity to a new generation of PPPs in emerging and socially critical sectors such as health, education, warehousing, sanitation, urban infrastructure, green hydrogen, and the broader energy transition. In these areas, conventional concession-style risk transfer is often insufficient. PPPs must increasingly reflect the third “P” — Partnership — where public and private actors co-design projects, share early-stage risks, and align incentives around long-term service outcomes rather than narrow financial closure.

Accordingly, India’s PPP framework needs to move from transaction-centric execution toward system-level market building, with a sharper focus on reducing structural uncertainty. This requires clearer sectoral pipelines with multi-year visibility, a tighter linkage between national programmes (PM GatiShakti, National Infrastructure Pipeline, sector missions), and bankable project preparation, as well as disciplined pre-construction risk closure by the public authority. PPP outcomes have been weakest where land acquisition, statutory clearances, demand assessment, or utility shifting have remained unresolved. In the coming decade, a credible PPP regime will be defined less by risk transfer on paper and more by the State’s capacity to absorb early-stage risks that private capital cannot efficiently price.

While PPP frameworks have matured at the central level and in select sectors, challenges persist at the sub-national level. The distinction between PPPs and Engineering Procurement and Construction (EPC) contracts—namely that PPPs are partnerships rather than vendor arrangements—is not always fully understood. Trust deficits and a limited understanding of risk–reward principles continue to constrain the uptake of PPPs in several states and urban local bodies. These challenges are compounded by uneven institutional capacity, even as states and cities account for a rising share of infrastructure demand. The next reform frontier lies in professionalising PPP cells, adopting programmatic approaches instead of project-by-project experimentation, and leveraging data platforms to track performance, renegotiation, and lifecycle outcomes. In this context, the Department of Economic Affairs’

schemes such as the India Infrastructure Project Development Fund (IIPDF) and Viability Gap Funding (VGF) are important.

An often-overlooked aspect relates to public perception. PPPs are sometimes perceived as ‘selling of assets’ rather than long-term service partnerships, particularly at the state level. Improving communication and transparency is therefore important for sustaining public acceptance and investor confidence, especially for projects with long concession periods. The perception principle has improved by a long margin among central projects as compared with States. The lesson is often lost that wrong signalling in this regard creates two problems – adversely affecting the public mood and driving away investors willing to stomach the entirety of risks across a long concession period (30-60 years).

India has also consciously deepened the financial architecture supporting PPPs since 2014. Long-term domestic capital, including pension funds, insurance funds, InvITs and Alternative Investment Funds (AIFs), has increasingly participated in brownfield assets. However, greenfield PPPs continue to rely heavily on bank balance sheets. Expanding construction-period risk mitigation tools, partial credit guarantees in social sectors, take-out financing, and standardised refinancing frameworks can materially lower the cost of capital. Equally important is creating predictable exit and restructuring pathways for stressed but viable projects, so that failure does not permanently impair investor confidence. A renegotiation framework for complex cases to prevent project termination is worth exploring. PPPs should be treated as evolving financial assets rather than one-time contracts frozen at financial close.

Finally, private sector participants that have benefitted from de-risked brownfield assets should be encouraged to increase their risk appetite for greenfield projects, particularly through pure-play PPP models such as BOT, especially in mature sectors like roads.

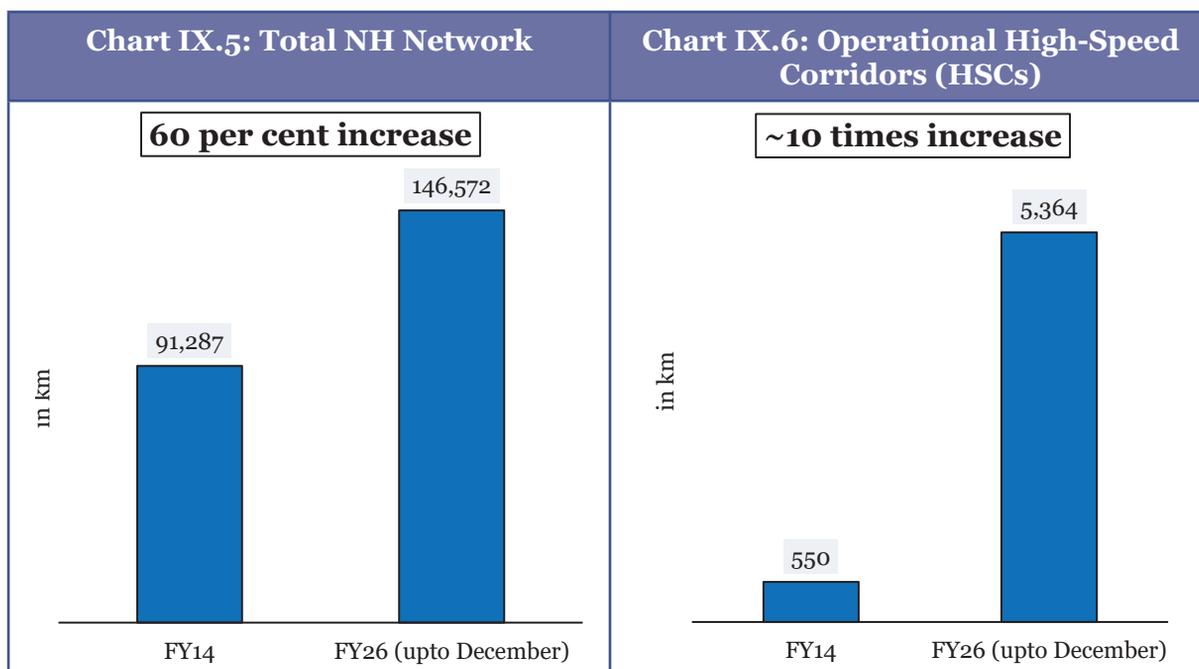
9.19 As also highlighted in the Economic Survey 2024-25, public sector efforts alone cannot meet India’s growing infrastructure requirements. While public investment remains crucial, a multi-pronged financing approach is essential to attract the requisite investments from the private sector and long-term institutional investors. This strategy requires strengthening resource mobilisation across all levels through innovative measures, including viable user charges and empowering municipal bodies to float bonds for localised resource generation. It also involves accelerating private participation including through public-private partnerships (PPPs). A wider array of PPP models with nuanced risk-sharing, right-price infrastructure services and a pipeline of bankable projects can facilitate infrastructure development significantly. Improved project preparation, standardised contracts and dispute resolution mechanisms are also critical to sustaining investor confidence and scaling PPPs.

## CORE PHYSICAL INFRASTRUCTURE

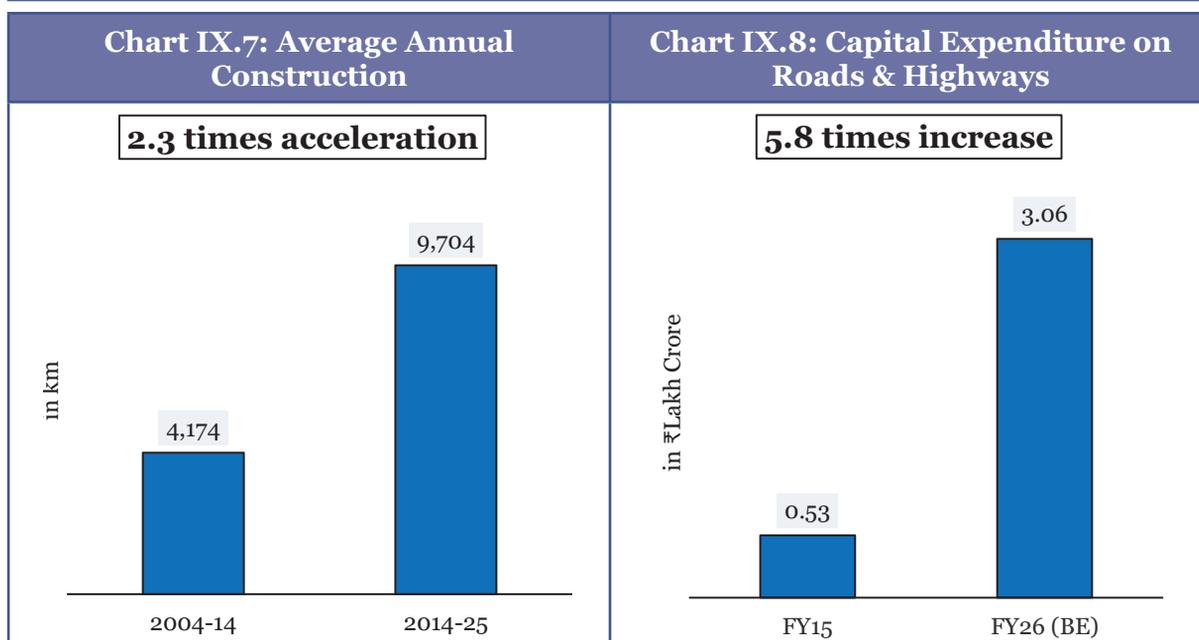
### Roadways & Highways

9.20 The roads and highways sector continues to be a primary driver of India’s infrastructure, transitioning from rapid capacity expansion to a focus on logistic

efficiency and technological integration. Over the past decade, sustained investment and policy reforms have significantly expanded the National Highway (NH) network and improved construction pace, laying a stronger foundation for multimodal connectivity and economic integration (Chart IX.5 to Chart IX.8). For FY26, 10,000 km of construction is targeted, of which 4,938 km have been completed as of 31 December 2025.<sup>7</sup> The key initiatives and reforms shaping the national highways programme are outlined in Box IX.3.



Source: Ministry of Roads, Transport & Highways.  
 Note: 5,364 km of operational HSCs includes National HSCs of 3,052 km and State HSCs of 2,312 km.



Source: Ministry of Roads, Transport & Highways.

<sup>7</sup> Ministry of Roads, Transport & Highways.

### Box IX.3: Key Initiatives and Reforms in the Roadways & Highways Sector

#### High Speed Connectivity and Urban Integration:

- **High-Speed Corridor (HSC) Development:** To align freight speeds with global benchmarks, the HSC network expanded from 550 km in 2014 to 5,364 km by December 2025. A total network of approximately 26,000 km is targeted by FY33, with 9,366 km currently under implementation.<sup>8</sup>
- **Economic Node Connectivity:** Priority is accorded to highway projects linking ports, Inland Water Transport (IWT) terminals, and industrial corridors to lower logistics costs.
- **Urban Decongestion:** A new policy for access-controlled ring roads and bypasses has been finalised for cities with populations over 1 lakh. This employs innovative cost-sharing models, such as land pooling and value capture, to transform urban centres into growth engines.

#### Privatisation and Asset Monetisation Roadmap:

- **Public InvIT:** The first Public InvIT is planned for launch in 2026. This follows a successful cumulative monetisation of ₹1.52 lakh crore through ToT and private InvITs.
- **Project Pipeline:** In line with the Budget announcement FY26, a dedicated PPP pipeline of 13,400 km (estimated cost of ₹8.3 lakh crore) has been identified for development over the next three years.

#### Reforms for improving Project Quality:

- **Project Preparation:** Fixed-cost bidding and introduction of performance rating as part of bid evaluation.
- **Construction:** Stricter eligibility norms, Additional Performance Security for low bids and introducing contractor performance rating.
- **Use of Technology:** Mandated use of drone surveys for alignment planning, deployment of Automated Intelligent Machine-Aided Construction (AIMC), and the use of pre-cast components for non-critical items mandated for projects above ₹300 crores. Additionally, a Drone Analytics Monitoring System has been introduced for encroachment, along with AI-based detection of potholes and cracks using network survey vehicles.

9.21 Within the broader infrastructure landscape, rural roads development has played a critical role in improving last-mile connectivity and rural integration. The Pradhan Mantri Gram Sadak Yojana (PMGSY) has achieved near-universal rural connectivity, with over 99.7 per cent of eligible habitations connected, as of 31 December 2025.<sup>9</sup> The

<sup>8</sup> *ibid.*

<sup>9</sup> Department of Rural Development.

programme has been strengthened through focused initiatives, including a dedicated road connectivity vertical under PM-JANMAN (Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan) to serve Particularly Vulnerable Tribal Groups (PTVGs), targeting 8,000 km of roads over the period 2023-28. As of 31 December 2025, 2,495 roads (7,323.96 km of road length) and 163 bridges have been sanctioned under PM-JANMAN for connecting 2,909 habitations, out of which 248 roads (1242.41 km of road length) has been completed.<sup>10</sup>

9.22 Further momentum has been reinforced through PMGSY-IV, launched in September 2024, which aims to connect 25,000 unconnected habitations by constructing or upgrading 62,500 km of roads and bridges at an estimated cost of ₹70,125 crore during FY25–FY29. The phase adopts international standards, GIS-based surveys, and the PM GatiShakti framework, while converging with the Dharti Abha–Janjatiya Gram Utkarsh Abhiyan (DA-JGUA) scheme to prioritise habitations with high Scheduled Tribes population. So far, 2,490 roads (8,655.378 km of road length) and 01 bridge have been sanctioned under PMGSY-IV, which will provide connectivity to 2,734 new habitations.

9.23 **Outlook:** India's roads and highways sector is moving from rapid network expansion towards greater logistics efficiency and quality. Sustained capital investment, expansion of high-speed corridors, multimodal integration under PM GatiShakti and reforms in project delivery are strengthening capacity and reliability. This infrastructure-led push is central for reducing logistics costs, easing congestion and improving connectivity.

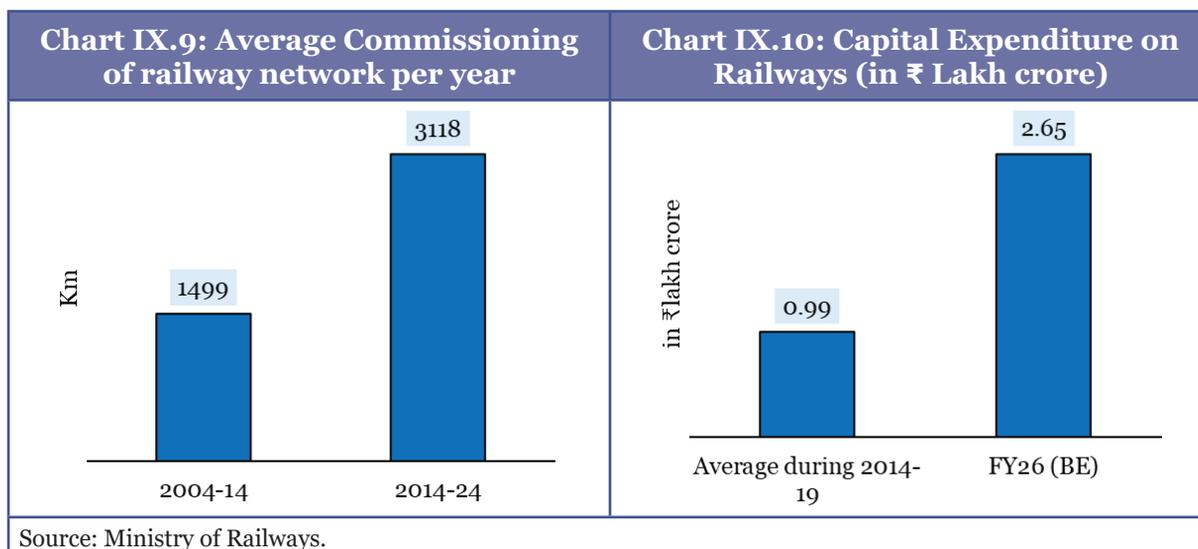
## Railways

9.24 Indian Railways continue to play a pivotal role in India's infrastructure landscape by expanding network capacity, modernising assets, and strengthening multimodal connectivity. As of March 2025, the rail network has expanded to 69,439 Rkm. During FY26, it is targeted to extend the network further by 3,500 km. Electrification has reached 99.1 per cent of the network by October 2025.<sup>11</sup> Sustained investments have enabled faster network expansion, with commissioning rates more than doubling in the post-2014 period compared to the previous decade (Chart IX.9).

---

<sup>10</sup> *ibid.*

<sup>11</sup> Ministry of Railways.



9.25 A defining feature of recent years has been the record capital expenditure on railway infrastructure, with a focus on new lines, doubling and multi-tracking, rolling stock augmentation, signalling, and safety-related works. In FY26 (BE), capital outlay has been maintained at historically high levels, to accelerate capacity creation in a time bound manner (Chart IX.10).

9.26 Railways have also emerged as a backbone of India's freight and energy logistics, supporting coal movement, industrial supply chains, and containerised traffic through dedicated corridors, modern terminals, and first-mile connectivity projects. Parallel investments in stations, signalling, telecom and digital systems are improving network reliability, safety, and user experience (Box IX.4).

#### Box IX.4: Key Infrastructure Initiatives in the Railways Sector

- **Economic Railway Corridors (PM GatiShakti):** Three corridor programmes—Energy, Mineral & Cement; Port Connectivity; and High Traffic Density routes—are being implemented to strengthen multimodal connectivity and logistics efficiency. 434 projects with an outlay of ₹11.17 lakh crore have been identified under three corridors and mapped on the PM GatiShakti portal. Of these, 122 projects covering 12,150 km have been sanctioned, and 198 projects spanning 19,779 km are under different stages of appraisal.
- **Major ongoing projects:**
  - **Mumbai–Ahmedabad High Speed Rail (MAHSR):** Over 55 per cent physical progress has been achieved as on October 2025, with land acquisition completed and most civil packages awarded, marking a major step towards introducing high-speed rail infrastructure in India.
  - **Dedicated Freight Corridors (DFCs):** About 2,741 km (96.4 per cent) of the 2,843 km DFC network has been commissioned as of October 2025, with the Eastern

DFC (1,337 km) fully completed and 1,404 km of the 1,506 km Western DFC completed. These corridors are easing congestion on the passenger network, significantly reducing freight transit times and contributing to lowering logistics costs.

- **Station Redevelopment:** Under the Amrit Bharat Station Scheme, 1,337 stations have been identified for phased redevelopment, with works completed at select stations and progress underway across the country to improve capacity, accessibility and multimodal integration. Further, 15 stations have been identified to develop/redevelop on PPP mode.
- **Safety & Technology Upgradation:** Large-scale deployment of Kavach [Advance Train Protection (ATP) System], electronic interlocking, automatic block signalling, and track renewal are enhancing network safety and throughput.
- **Track upgradation:** More than 78 per cent of railway tracks have been upgraded for sectional speed of 110 kmph and above.
- **Public–Private Partnerships (PPPs):** 18 projects worth ₹16,636 crore have been completed and seven projects worth ₹16,334 crore are under implementation as on September 2025.<sup>12</sup>

9.27 **Outlook:** Indian Railways is undergoing a transformation, driven by sustained capital investment, rapid network expansion, near-universal electrification and a corridor-based approach to capacity creation. Continued focus on dedicated freight corridors, economic rail corridors under PM GatiShakti, and modern signalling and station infrastructure is improving throughput, reliability and multimodal integration. These infrastructure-led initiatives will be central for reducing logistics costs, and strengthening connectivity.

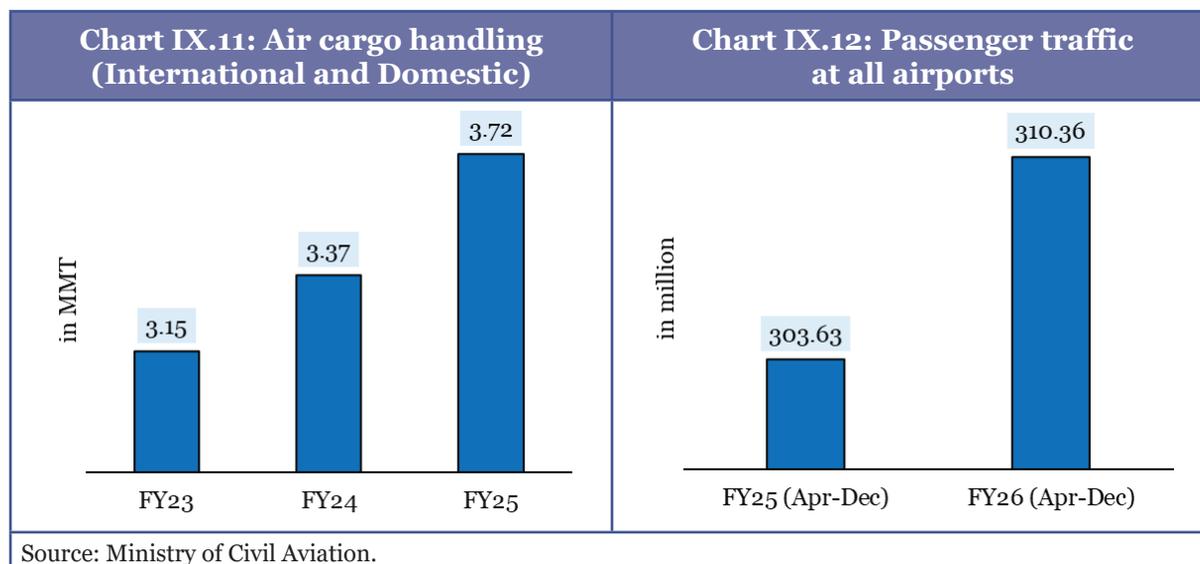
## Civil Aviation

9.28 India has emerged as the world's third-largest domestic aviation market. The number of airports increased from 74 in 2014 to 164 in 2025.<sup>13</sup> In FY25, Indian airports handled 412 million passengers, and the same is projected to increase to 665 million by FY31. Further, air cargo volume grew from 2.53 million metric tonnes (MMT) in FY15 to 3.72 MMT in FY25, and 2.95 MMT handled in FY26 (until December), driven by several key policy initiatives and reforms (Box IX.5).<sup>14</sup>

<sup>12</sup> Ministry of Railways.

<sup>13</sup> PIB Release: <https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2181865&reg=3&lang=2>.

<sup>14</sup> Ministry of Civil Aviation.



### Box IX.5: Key policy initiatives driving civil aviation growth

- Regional Connectivity Scheme- Ude Desh ka Aam Nagrik (RCS-UDAN):** Operationalisation of 657 routes connecting 93 airports, including heliports and water aerodromes, has made air travel affordable while improving access to remote and aspirational regions. Further, the modified UDAN Scheme has been announced to increase regional connectivity to 120 new destinations and cater to 4 crore passengers over the next 10 years.
- Greenfield Airports Policy:** In-principle approval for 24 Greenfield airports, with 13 already operational airports, including the Navi Mumbai International Airport, is expanding urban and regional capacity.
- Airport Modernisation & Capacity Expansion:** Since FY20, modernisation projects at several airports across the country have successfully raised combined passenger-handling capacity of operational airports to approximately 575 million passengers per annum.
- Digital & Technological Initiatives:** Expansion of Digi Yatra, liberalised drone regulations, PLI support for drone manufacturing, and focus on Advanced Air Mobility (AAM) have been ongoing.
- Legislative Reforms:**
  - The **Bharatiya Vayuyan Vidheyak, 2024**, replacing the Aircraft Act, 1934, aims to modernize India's aviation sector by enhancing safety, innovation, growth, and global compliance.
  - The **Protection of Interests in Aircraft Objects Act, 2025**, aims to align India's aviation leasing laws with global standards to reduce leasing costs.

**9.29 Outlook:** India's civil aviation sector is on a sustained growth trajectory, supported by a conducive policy environment, rising demand and steady infrastructure expansion. While the sector remains sensitive to global economic cycles and the need for continuous capacity upgradation, the current passenger volumes represent only a fraction of India's potential. Further, India currently operates approximately 0.11 airports per million people, significantly lower than the US (47.35) and China (0.39)<sup>15</sup>, signalling substantial headroom for further growth. Expansion in India's airport and air navigation infrastructure and a growing ancillary ecosystem, including Maintenance, Repair, and Overhaul (MRO) and leasing, are strengthening the sector. These developments, along with technology integration, positions civil aviation as a key driver of nationwide economic connectivity and integration.

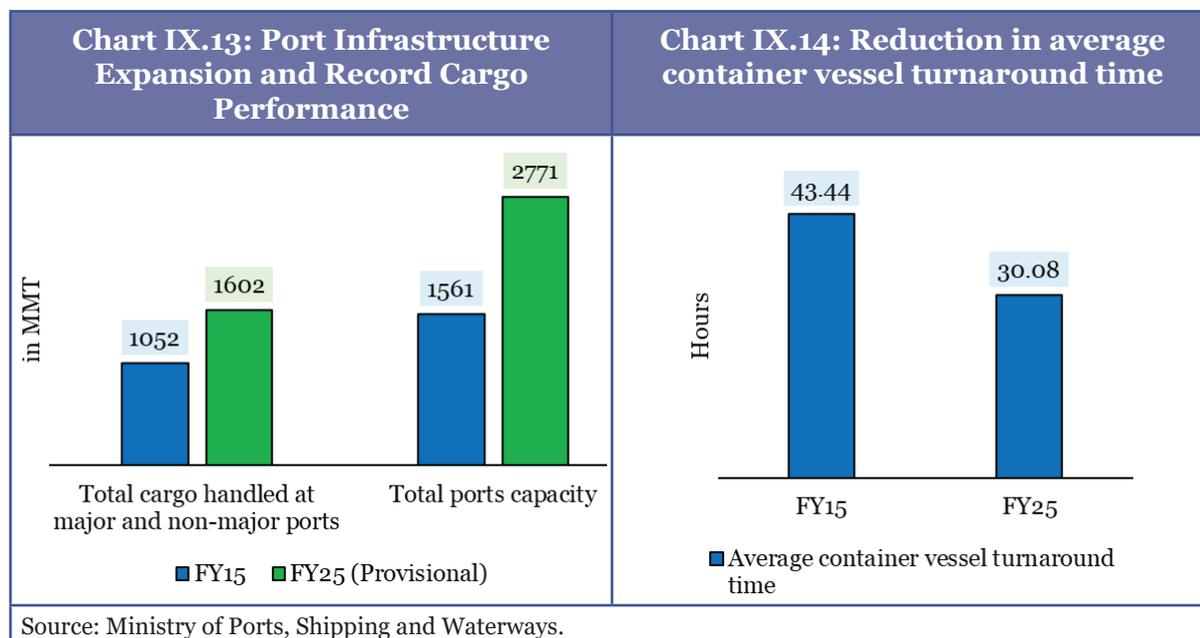
## Ports and Shipping

**9.30** India's maritime sector has undergone significant modernisation and is emerging as an essential pillar of logistics competitiveness, industrial growth and global supply-chain integration. Under Maritime India Vision 2030 and Maritime Amrit Kaal Vision 2047, substantial progress has been made in upgrading port infrastructure, enhancing regulatory frameworks, improving operational efficiency, and increasing private sector participation.

**9.31** India's ports have demonstrated strong growth momentum, driven by accelerated capacity creation and a substantial increase in cargo throughput (Chart IX.13). Furthermore, mechanisation, smart port initiatives, and digital trade facilitation have significantly improved operational efficiency across major ports, with the average container vessel turnaround time achieving near-global best standards (Chart IX.14). India's growing competitiveness is reflected in global rankings, with two Indian ports now featuring among the top 30 and seven among the top 100 in the World Bank's Container Port Performance Index 2024. Recent legislative reforms in the ports and shipping sector may be seen at Box IX.6.

---

<sup>15</sup> Airport density figures are calculated based on the total number of operational airports (commercial and general aviation) as reported in the CIA World Factbook 2025 and International Civil Aviation Organization (ICAO) Data Plus (2025 estimates), divided by the mid-year population projections from the World Bank Open Data 2025. High values for the USA (~47 per million) reflect a mature market with a high concentration of general aviation and municipal airfields (over 15,000). For India, the focus is primarily on commercial hubs and regional airports under active development schemes, indicating significant structural headroom for future expansion.



9.32 India has further strengthened the landlord port model<sup>16</sup> to catalyse private investments in port development and operations. This strategic shift is evident in the substantial growth of PPP projects. The number of PPP projects awarded rose from 37 in FY15 to 87 in FY25, with the total value of PPP projects increasing from ₹16,180 crore to ₹61,029 crore, reflecting a 377 per cent rise. Currently, 57 operational PPP projects valued at ₹42,235 crore have increased port capacity by approximately 660 MTPA.

9.33 **Outlook:** PPP and captive operators are projected to handle 80 per cent of all cargo at major ports by 2030. A pipeline of 48 PPP projects worth approximately ₹23,000 crore (excluding the Development of Vadhvan Port Project of worth ₹76,220 crore) has been identified for the next five years (FY26 to FY31). These projects will further enhance the capacity and efficiency of India's Major Ports.<sup>17</sup>

#### Box IX.6: Recent Legislative Reforms in Ports and Shipping Sector

- **Merchant Shipping Act, 2025:** It aligns Indian maritime laws with global standards and International Maritime Organisation (IMO) conventions, promotes ease of doing business, ensures seafarer welfare and training, and enhances safety, environmental protection and emergency preparedness.
- **Coastal Shipping Act, 2025:** Promotes coastal shipping as an economical and eco-friendly mode, removes licensing requirements for Indian vessels in coasting trade and

<sup>16</sup> In line with the Major Port Authorities Act, 2021, the landlord port model provides for port authorities to retain ownership of port land and core infrastructure while awarding long-term concessions to private operators for terminal development and operations, with an aim to enhance operational efficiency and modernize infrastructure through private investment.

<sup>17</sup> Ministry of Ports, Shipping and Waterways.

introduces strategic planning for coastal and inland waterways integration and improves transparency through a National Coastal Shipping Database.

- **Indian Ports Act, 2025:** Establishes a comprehensive framework for long-term integrated port development, promotes collaboration between the Centre and States for strategic planning, mandates data sharing for transparency, and ensures compliance with international conventions on pollution prevention, safety and security, along with introduction of Maritime Single Window System to reduce logistics costs and strengthen competitiveness.
- **Bills of Lading Act, 2025:** Simplifies legal provisions on bills of lading, clearly defining transfer of rights and liabilities among carriers, shippers, and consignees to reduce disputes and improve trade efficiency.
- **Carriage of Goods by Sea Act, 2025:** Aligns India's sea trade laws with international norms, especially the Hague-Visby Rules, by defining carrier–shipper responsibilities and immunities, supporting agreements like India–UK CETA, and enhancing global maritime trade competitiveness.

## Inland Water Transport

9.34 As of November 2025, 32 National Waterways (NWs) are operational, spanning 5,155 km, with cargo operations on 29 NWs, cruise operations on 15 NWs, and passenger services on 23 NWs; 11 NWs support all three modes, reflecting strong multimodal integration. Cargo movement through Inland Water Transport (IWT) has also risen significantly from 18 MMT in 2013-2014 to 146 MMT in 2024-2025, driven by several reforms and key projects in the sector (Box IX.7). Passenger movement has grown to 7.6 crore in 2024-25 from 1.61 crore in 2023-24.

### Box IX.7: Inland waterways transformation: Achievements, Key Projects and Initiatives

#### Jal Marg Vikas Project (JMVP):

- ₹4,600 crore project for National Waterway-1 (NW-1), spanning 1,390 km waterway length (Varanasi to Haldia) with scheduled completion date as 30 June 2026.
- Cargo movement on NW-1 increased by 220 per cent, rising from 5.05 MMT (2014-15) to 16.38 MMT (2024-25).
- Major Multi-Modal Terminals (MMTs) (Varanasi, Sahibganj, Haldia) and the Inter-Modal Terminal (Kalughat) are operational.
- Quick Pontoon Opening Mechanism (QPOM) initiative has been undertaken which replaces bridge cutting/welding delays with a 5-minute vessel passage.
- **Arth Ganga Initiative:** 53 of 86 community jetties along NW-1 are operational (as of Nov 2025), promoting local trade and serving up to 1.22 lakh daily users.

### River Cruise Tourism:

- Cruise vessels increased from 3 in 2013–14 to 25 in 2024–25 across 15 circuits on 13 NWs in 9 states, supported by a 4,000 km Varanasi–Dibrugarh corridor with 129 terminals.
- Four new cruise terminals at Silghat, Bishwanath Ghat, Neamati, and Guijan are planned by 2027.

**Cargo Promotion:** The Jalvahak Scheme, launched in 2024, provides incentives to vessel operators and promotes scheduled cargo services on NW-1, NW-2, and NW-16 via the IBP route.

### Digital Initiatives:

- **Jal Samridhi:** National Waterways (Construction of Jetties/Terminals) Regulations, 2025 notified a portal to streamline NoC applications for construction of jetties/terminals to promote private investment.
- **Jalyan and Navic:** Unified platform for vessel and crew registry enabling ‘One Nation–One Registration’.
- **Naudarshika:** A platform designed to ensure seamless and sustainable vessel movement, enhance operational efficiency, improve safety for vessels and passengers, provides live data on Least Available Depth (LAD) to aid navigation.

**North-East Region:** IWT projects are underway on NW-2 and NW-16; DPRs for Nagaland and Mizoram are under finalisation. Tripura is implementing a ₹24.53 crore project for connecting Gumti River, India–Meghna River, Bangladesh linkage.

### Box IX.8: Urban Water Transport: Kochi Water Metro as a Scalable Model

The Kochi Water Metro (KWM), operational since 2023, represents a landmark shift in India’s urban mobility by re-establishing inland waterways as a sustainable mass transit option. The project is institutionalised through a Special Purpose Vehicle (SPV) incorporated in 2021, with the Government of Kerala holding 74 per cent equity and Kochi Metro Rail Limited (KMRL) holding the remaining 26 per cent. KMRL itself is a joint venture between the Government of India and the Government of Kerala.<sup>18</sup>

The project entails a planned network of 15 routes covering approximately 78 km, connecting 10 islands through 38 modern terminals and jetties. With a total project cost of about ₹819 crore, financing includes an €85 million long-term concessional loan from the German development bank KfW under the Indo-German Financial Cooperation framework, complemented by state government support.<sup>19</sup>

<sup>18</sup> Radhika P. Nair, “India is rediscovering its waterways. Can a Kochi experiment go national?,” Mint (1 Dec 2025), available at <https://tinyurl.com/7e7y9fcx>

<sup>19</sup> <https://watermetro.co.in/about>

A defining feature of KWM is its deployment of air-conditioned electric-hybrid ferries designed and built by Cochin Shipyard Limited following a global tender. Each vessel carries around 100 passengers and is powered by lithium titanate oxide (LTO) batteries, enabling rapid charging and high cycle life. The terminals are designed with universal accessibility standards, and the service is fully integrated with the Kochi Metro Rail system through unified digital ticketing and interoperable smart cards, enabling seamless multimodal travel. As of 2025, cumulative ridership has crossed five million passengers, with island communities such as Vypin, Bolgatty, and Mattancherry experiencing improved connectivity to the urban core.<sup>20</sup>

From a cost-effectiveness perspective, water metros offer a significant advantage over rail-based systems by leveraging existing waterways and minimising land acquisition and elevated infrastructure. Estimates suggest that a 75 km water metro network can be developed at roughly one-tenth the cost of a comparable elevated metro corridor, making it an attractive option for suitable urban geographies. However, scalability remains contingent on hydrological suitability, assured year-round navigability, availability of electric or alternative-fuel vessels, and coordinated financing across multiple levels of government.

The success of the KWM serves as a scalable model for other Indian cities with navigable water bodies, potentially offering sustainable and efficient transportation options.<sup>21</sup> The model is being replicated in 21 cities, with feasibility studies in several cities in process, including Ayodhya, Dhubri, Goa, Guwahati, Kollam, Kolkata, Prayagraj, Patna, Srinagar, Varanasi, Mumbai, Vasai, Mangalore (Gurupura River), Gandhinagar-Ahmedabad (Sabarmati River), Alleppey in Kerala, as well as Lakshadweep and Andaman & Nicobar Islands.<sup>22</sup>

Overall, the Kochi Water Metro demonstrates how institutional innovation, green technology, and multimodal integration can convert natural water assets into efficient urban infrastructure. While replication must remain context-specific and demand-driven, the model provides a credible template for sustainable urban transport in India's riverine and coastal cities.

**9.35 Outlook:** India aims to increase the Inland Water Transport modal share from 2 per cent to 5 per cent and raise cargo traffic to 200+ MMT by 2030 and 500 MMT by 2047 under the Maritime Amrit Kaal Vision.

**9.36 Shipbuilding:** In September 2025, the Government of India approved a comprehensive package of ₹69,725 crore (approximately USD 8.3 billion) to revitalise the country's shipbuilding and maritime ecosystem. The initiative adopts a four-pillar approach aimed at developing a globally competitive, technologically advanced and sustainable maritime sector. Key policy initiatives and achievements driving the maritime transformation are elaborated in Box IX.9.

<sup>20</sup> Ibid.

<sup>21</sup> <https://www.pppinindia.gov.in/bestpractices/best-practice-detail/kochi-water-metro-project>

<sup>22</sup> PIB Release available at <https://tinyurl.com/2wxpk2fa>.

### Box IX.9: Shipbuilding: Reforms, Achievements, Key Projects and Initiatives

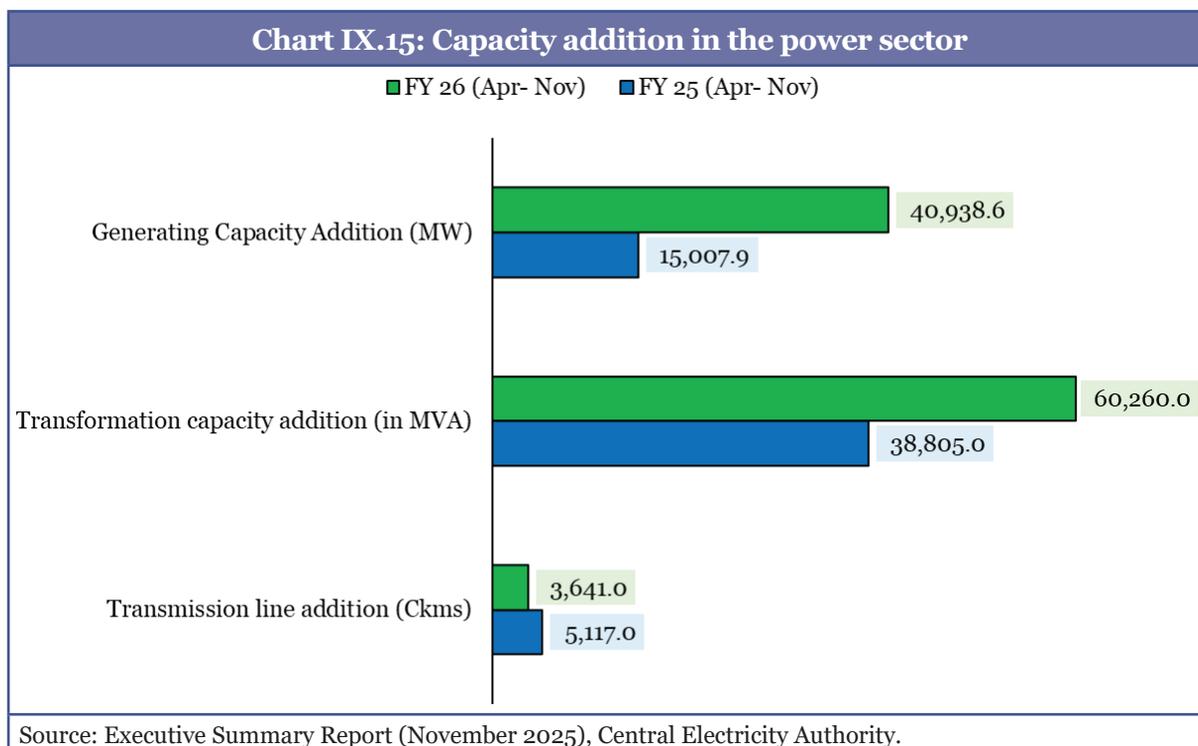
- **Shipbuilding Financial Assistance Scheme (SBFAS):** The Scheme, with a corpus of ₹24,736 crore and validity up to 31 March 2036, provides structured incentives for shipbuilding within India, including a shipbreaking credit note of ₹4,001 crore to promote environmentally responsible recycling and green shipbuilding practices.
- **Maritime Financing and Investment Framework:** A dedicated Maritime Development Fund (MDF) of ₹25,000 crore has been approved to strengthen long-term sectoral financing, attract investment and promote PPPs. This includes:
  - i. Maritime Investment Fund of ₹20,000 crore, with 49 per cent participation from the Government of India, and
  - ii. Interest Incentivization Fund of ₹5,000 crore to lower financing costs and enhance project viability.
- **Shipbuilding Development Scheme (SbDS):** With an outlay of ₹19,989 crore, the SbDS seeks to enhance shipbuilding capacity to 4.5 million Gross Tonnage (GT) annually and support development of greenfield mega shipbuilding clusters, modernization of existing shipyards, risk and insurance support for shipbuilding projects, and establishment of an India Ship Technology Centre to help develop India's capabilities related to shipbuilding design, training of manpower, R&D in shipbuilding and co-ordination for testing facilities.
- **Inclusion of Ships in Infrastructure Category:** Large ships (above a specified size) have been included in the Infrastructure Harmonised Master List (HML) in September 2025.

## ENERGY SECTOR

### Power

9.37 The power sector continues to expand, with the installed capacity rising by 11.6 per cent year-on-year to 509.74 GW as of November 2025.<sup>23</sup> The addition of transformation capacity also gained momentum this year (Chart IX.15).

<sup>23</sup> Installed Capacity Report (November 2025), Central Electricity Authority available at <https://cea.nic.in/installed-capacity-report/?lang=en>.



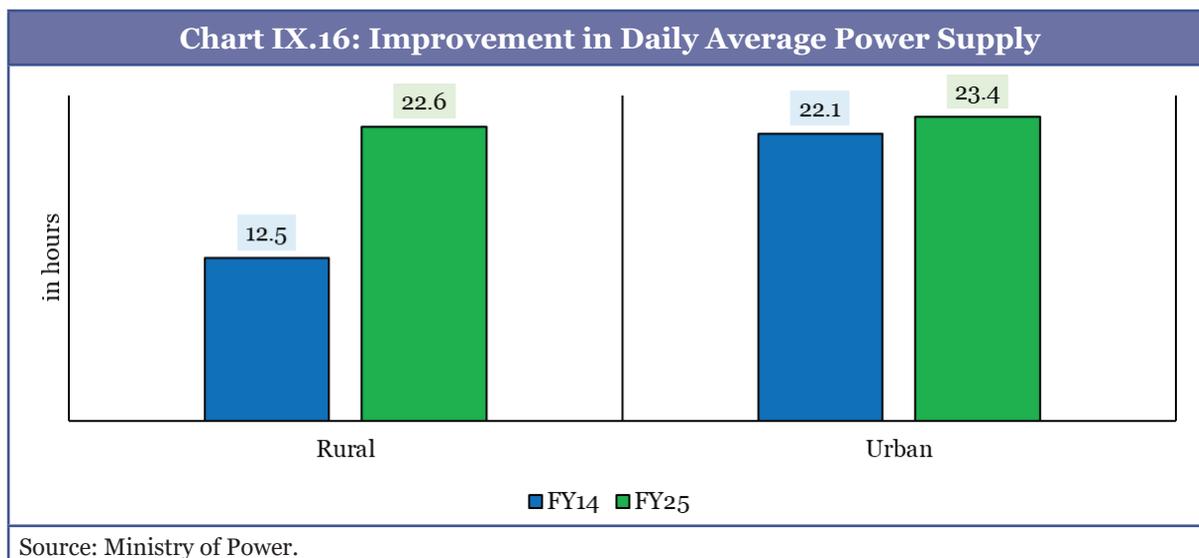
9.38 The Government of India implemented multiple initiatives aimed at supporting States/distribution utilities for providing uninterrupted power supply to every household. Under the Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY), the Integrated Power Development Scheme (IPDS), introduced in 2014, and the Pradhan Mantri Sahaj Bijli Har Ghar Yojana (SAUBHAGYA), introduced in 2017, about ₹1.85 lakh crore has also been invested to boost distribution infrastructure across various states. Around, 18,374 villages were electrified under DDUGJY, and 2.86 crore households have gained access to electricity during SAUBHAGYA period. To further support States to improve financial sustainability and operational efficiency of distribution utilities, the Revamped Distribution Sector Scheme was launched in 2021 with an outlay of ₹3.03 lakh crore, wherein projects worth ₹2.8 lakh crore have been approved to improve distribution infrastructure and implement smart metering solutions.<sup>24</sup>

9.39 These interventions have contributed significantly in improving power availability and reliability, particularly in rural areas (Chart IX.16). The gap between energy demand and supply has also declined from 4.2 per cent in FY14 to nil by November 2025.<sup>25</sup> Besides, several initiatives have been undertaken to strengthen the viability and operational efficiency of Distribution Companies (DISCOMs) (Box IX.10).

<sup>24</sup> Ministry of Power.

<sup>25</sup> *ibid.*

9.40 To further strengthen distribution sector, the Government has proposed the Electricity (Amendment) Bill, 2026, with the objective of enhancing efficiency, competition, and financial discipline in the power sector. The Bill seeks to enable regulated competition in electricity distribution, promote cost-reflective tariffs, strengthen payment security for generators, and improve regulatory accountability, while continuing to safeguard subsidised supply for vulnerable consumers.<sup>26</sup>



### Box IX.10: Reforming the last mile - Key initiatives to strengthen DISCOM finances

The distribution sector remains the most critical yet financially vulnerable segment of India's power value chain. Operating as regulatory monopolies, many DISCOMs face operational inefficiency and financial distress. Between 2020-21 and 2024-25, accumulated losses rose from ₹5.5 lakh crore to ₹6.47 lakh crore, with outstanding debt increasing to ₹7.26 lakh crore. This is rooted in non-cost-reflective tariffs, delayed state subsidies payment, and high Aggregate Technical and Commercial (AT&C) losses. To safeguard the long-term sustainability of the sector, the Government of India has introduced several reforms to strengthen the DISCOM finances, reduce losses, and ensure long-term sector sustainability including the following:-

1. **Late Payment Surcharge (LPS) Rules:** Streamlined payment discipline has sharply reduced outstanding dues from ₹1.4 lakh crore (June 2022) to ₹4,927 crore (January 2026).
2. **Automatic Monthly Fuel & Power Purchase Cost Adjustment:** Rules to provide for formula-based monthly tariff adjustments were notified to prevent cash-flow gaps for DISCOMs.
3. **Recognition of Prudent Costs:** Rules notified to allow pass through of prudent power procurement and distribution network costs, subject to regulatory approval.

<sup>26</sup> PIB Release available at <https://tinyurl.com/f5cst2k6>.

4. **Timely Recovery of Change-in-Law Costs:** The 2021 Rules provide for automatic tariff adjustment to restore affected generators or licensees to their original economic position.
5. **Effective Subsidy Accounting:** Standard operating procedures laid to ensure timely release of state government subsidies and improve financial transparency.
6. **Aggregate Technical and Commercial Loss Reduction Mandate:** Loss reduction trajectories to be aligned with targets agreed under national schemes, promoting cost-reflective tariffs.
7. **Return on Equity (RoE) Alignment:** State Commissions should allow reasonable RoE aligned with Central Electricity Regulatory Commission (CERC) norms, improving investor confidence.
8. **Cost-Reflective Tariffs & Revenue Gap Liquidation:** Tariffs must match the approved Annual Revenue Requirement, with any gap capped at 3 per cent (except during natural calamities). New gaps must be cleared in three annual instalments, while legacy gaps (as of Jan 2024) must be recovered over seven instalments.
9. **Revamped Distribution Sector Scheme (RDSS):** RDSS launched with the objective of improving the quality and reliability of power through a financially sustainable and operationally efficient distribution sector. The release of funds under the scheme is linked to States/ distribution utilities taking necessary measures to improve their performance.
10. **Additional Prudential Norms:** As per the norms, financing to State-owned power utilities is linked to the operational performance of their respective State distribution utilities.

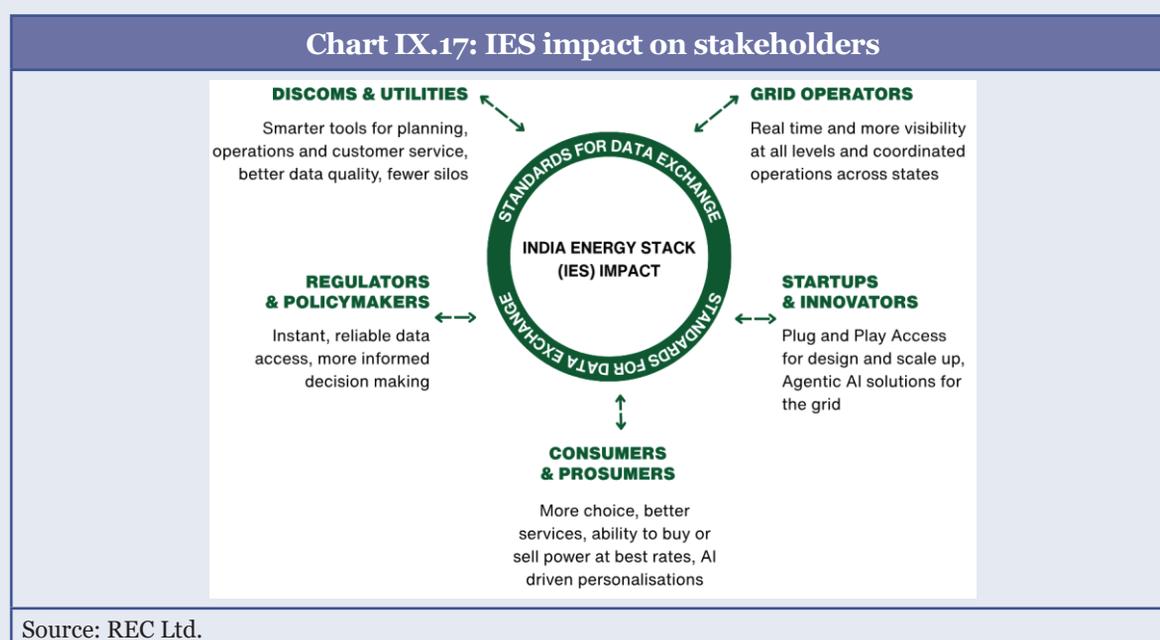
As a result of these measures, in a historic first, the country's power distribution utilities (DISCOMs and power departments) have recorded a positive Profit After Tax (PAT) of ₹2,701 crore in FY25, marking a decisive turnaround from a loss of ₹67,962 crore in FY14. This improvement has been accompanied by a sustained reduction in Aggregate Technical and Commercial (AT&C) losses, from 22.62 per cent in FY14 to 15.04 per cent in FY25. Further, the Average Cost of Supply–Average Revenue Realised (ACS–ARR) gap (on an accrual basis) has also narrowed from ₹0.78/kWh in FY14 to ₹0.06/kWh in FY25, signalling much improved cost recovery.

#### **Box IX.11: Enabling Consumer Agency, Open Innovation, and System Efficiency through India Energy Stack (IES)**

India's energy transition is reshaping the power sector from a centrally managed system to one that is increasingly distributed, digital, and participatory. Rooftop solar, smart meters, storage, electric mobility, and flexible demand are turning households, farmers, and MSMEs into active energy participants. This transition is not only about cleaner energy- it also carries the potential to create livelihoods and income opportunities for millions of small energy participants.

Yet the digital foundations of the sector remain fragmented. Data is locked in silos, integrations are bespoke and costly, and market participation does not scale. This limits consumer choice, constrains innovation, and creates inefficiencies for utilities and regulators alike and prevents distributed energy assets from translating into reliable income streams. The result is an energy system where value exists but remains difficult to access for ordinary consumers.<sup>27</sup>

India Energy Stack (IES) will address this foundational gap. Conceived as a Digital Public Infrastructure (DPI) for the power sector, IES is envisioned to provide common digital rails that will enable trusted interactions among stakeholders and assets through open standards and protocols.<sup>28</sup> Under the Ministry of Power's leadership, a Taskforce has been setup with REC Limited as the nodal agency for driving the design, coordination, and phased implementation of India Energy Stack, leveraging its sector-wide institutional reach, financing expertise, and convening role across DISCOMs, state governments, and private stakeholders. IES is neither a centralised platform nor a central database. Data remains with rightful owners and is shared only through consent-based mechanisms. By standardising identity, data exchange, measurement, and settlement, IES will help create a power ecosystem that is interoperable, competitive, consumer-centric and capable of converting participation into economic value (see Chart IX.17).



### 1. Consumer value at the core: choice, participation, and income

At its heart, IES aims at strengthening energy agency—the ability of consumers to choose services, participate in markets, and monetise their assets or actions.

- **Simpler and portable participation:** IES will facilitate interoperable interfaces with standardised onboarding and verified credentials. Consumers will not have to

<sup>27</sup> REC Ltd.

<sup>28</sup> Ministry of Power. India Energy Stack (IES) strategy document: Version 0.2. Government of India (2025); India Energy Stack (IES) architecture document: Version 0.2. Government of India.

repeat documentation or technical integrations for each utility or service provider. IES will enable once-only participation across services, vendors, and geographies lowering transaction costs for all participants.

- **Meaningful consumer choice through consent-based data sharing:** IES will enable consumers to share their data securely and selectively with service providers of their choice. This will unlock competition in energy advisory, billing support, efficiency services, EV charging, and demand response. By making data portable, IES intends to avoid lock-in into a single utility or vendor workflow thereby enabling competition for better services on value, transparency, and outcomes.
- **Monetisation of distributed assets:** Small and distributed assets—rooftop solar, batteries, EV chargers, and flexible loads—only translate into income when measurement, verification, and settlement are reliable at scale. IES aims at standardising these foundational functions, enabling aggregation and market participation with confidence. Consumers will transform from passive recipients of energy into active participants.

## 2. Open innovation and scalable energy markets

IES does not prescribe business models. Instead, it creates the enabling conditions for markets to emerge. By lowering entry barriers and standardising interfaces, IES will enable a new ecosystem of service providers: peer-to-peer (P2P) trading platforms, demand-response and flexibility aggregators, rooftop and battery optimisation firms, EV charging operators, settlement and compliance services, and local energy advisors. These firms can operate locally while scaling nationally through common specifications creating significant economic value for the consumers in this process.

**Peer-to-peer electricity trading** offers a clear illustration. Prosumers—households, farmers, or MSMEs with surplus generation—will be able to sell electricity directly to other consumers, subject to grid and regulatory constraints. Without common protocols, P2P remains confined to pilots, and the IES will enable P2P trading at scale, including across utility jurisdictions, converting surplus energy into a tradable economic asset.

As these markets mature, advanced analytics and AI-enabled agents can generate insights or automate trading and flexibility decisions on behalf of consumers. This deepens participation while reducing complexity, allowing even small consumers to engage confidently in energy markets.

## 3. Structural benefits for DISCOMs and regulators

IES is envisaged to improve coordination in a distributed grid by providing common rules for trusted interaction reducing disputes, delays, and operational risk as transaction volumes scale.

For DISCOMs, scaled P2P trading reduces exposure to surplus energy payouts already settled between peers, while improving collection efficiency through wheeling charges. Standardised, near-real-time settlement improves demand forecasting and operational planning. Over time, this shifts utilities from being sole intermediaries to being system orchestrators in a more dynamic market.

Regulators benefit from enhanced transparency and enforceability. IES enables policy as code, where rules for settlement, penalties, compliance, and market participation are embedded into standardised protocols.

#### 4. Enhancing livelihoods, and inclusion

IES is intended to ultimately connect system efficiency directly to consumer welfare and livelihood creation by enabling flexibility and participation as earn-able activities. With implementation of standardised use cases at scale, Households, MSMEs, and agricultural consumers can monetise actions through options like off-peak EV charging, reduced cooling loads, or temporary load curtailment. IES enables verification and settlement at scale, allowing millions of small actions to be bundled into dependable grid support. This creates a new class of energy micro-entrepreneurs who earn not only by generating power, but also through consumer flexibility and services.

IES-enabled markets also align strongly with women-led livelihood programmes such as DAY-NRLM (Jeevika). Women Self-Help Groups can collectively own rooftop or community solar assets, trade surplus electricity, and power micro-enterprises in food processing, tailoring, dairy, and agri-allied activities. Reliable and affordable electricity improves productivity through mechanisation and cold-chain access, while participation in digital energy platforms strengthens financial inclusion, digital literacy, and leadership within village institutions. This convergence demonstrates how energy reform can advance inclusive growth and climate-resilient rural development simultaneously.

#### Openness with safeguards

IES balances open innovation with strong safeguards for privacy, cybersecurity, and grid security through verified identities, consent, audit trails, and conformance checks.

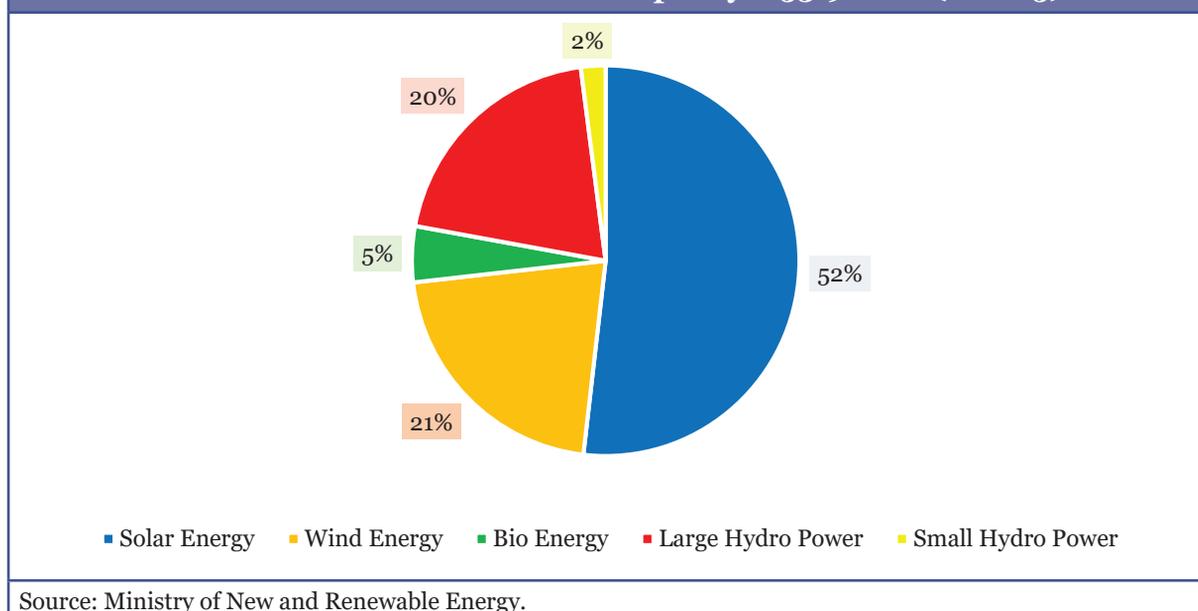
**From energy access to energy agency:** IES is not merely a technology initiative- it is a market-enabling reform that shifts the focus of India's power sector from energy access to energy agency. By aligning consumer empowerment, open innovation, system efficiency and livelihood creation, IES gives every consumer the ability to choose, act, and earn from the energy transition at national scale.

## Renewable energy

9.41 India's energy landscape is undergoing a structural transformation, with renewable energy (RE) now constituting around 49.83 per cent of the total installed power generation capacity as of 30 November 2025.<sup>29</sup> The country maintains a dominant global presence, ranking third in overall RE capacity and installed solar capacity and fourth in installed wind capacity. Total RE capacity witnessed a more than threefold increase over the last decade, surging from 76.38 GW in March 2014 to 253.96 GW by November 2025.<sup>30</sup> This substantial growth reflects the effectiveness of national renewable energy policies, large-scale project execution, and strong private sector participation in advancing India's clean energy transition.

<sup>29</sup> Ministry of New and Renewable Energy.

<sup>30</sup> *ibid.*

**Chart IX.18: Total installed RE capacity: 253.96 GW (Nov'25)**

9.42 The first eight months of FY26 (up to November 2025) recorded a historic 34.56 GW addition—the largest ever annual increase in non-fossil capacity. This expansion was led by Solar (27.20 GW), followed by Wind (3.95 GW), Hydro (2.68 GW), Bio-Power (0.03 GW) and Nuclear (0.70 GW).

9.43 **Outlook:** To sustain India's renewable energy momentum, challenges such as high capital costs, land acquisition delays, and grid availability need to be addressed through appropriate instruments including innovative financing mechanisms and optimised project execution. Further, large-scale integration of Battery Energy Storage Systems (BESS) and Pumped Storage Hydropower (PSP) can address the inherent variability of renewables, ensure grid stability and peak-load management, and enable reliable, large-scale adoption of renewables to support the transition to a clean, secure, and resilient power system.

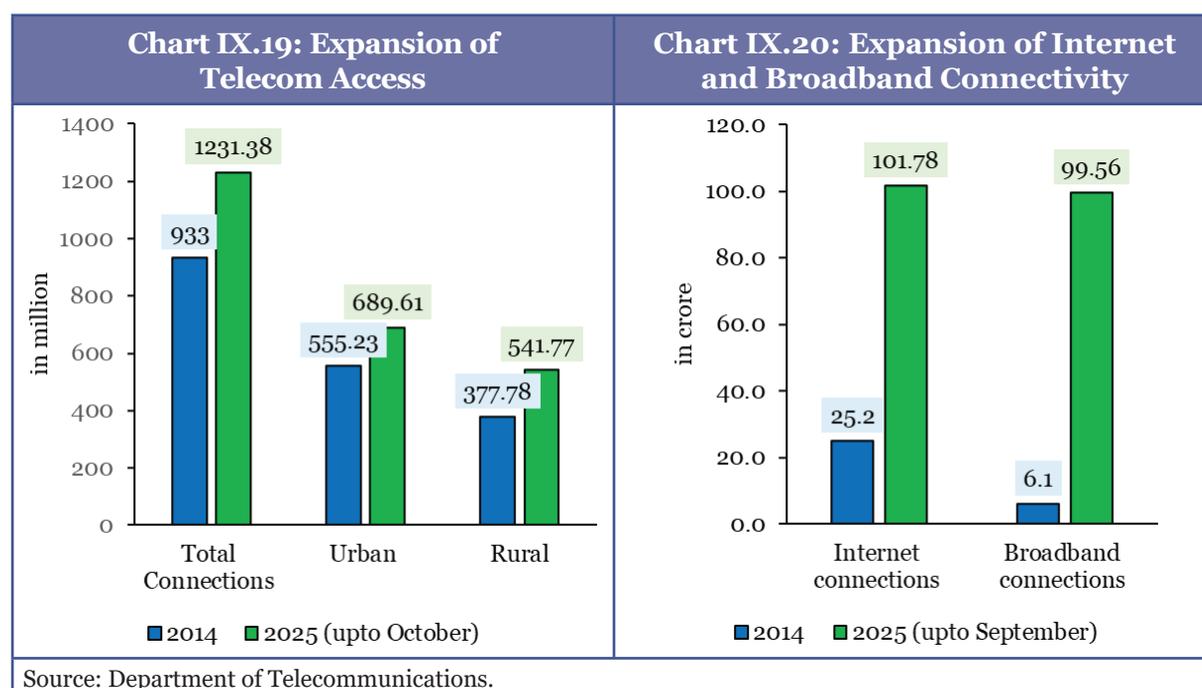
## FUTURE-READY DIGITAL INFRASTRUCTURE

### Telecommunications

9.44 India's telecom sector has undergone a significant transformation, driven by initiatives such as 5G deployment, 6G research, BharatNet, and Digital Bharat Nidhi, reflecting the Government's vision of a digitally empowered nation. With innovations including indigenous 4G by BSNL, 100 5G Labs, and citizen-centric platforms, the sector is advancing toward self-reliance, enhanced security, and global leadership. Efforts are focused on creating a telecom ecosystem that is *Samaveshit* (ubiquitous connectivity fuelling inclusive growth), *Viksit* (developed India through a triad of perform, reform,

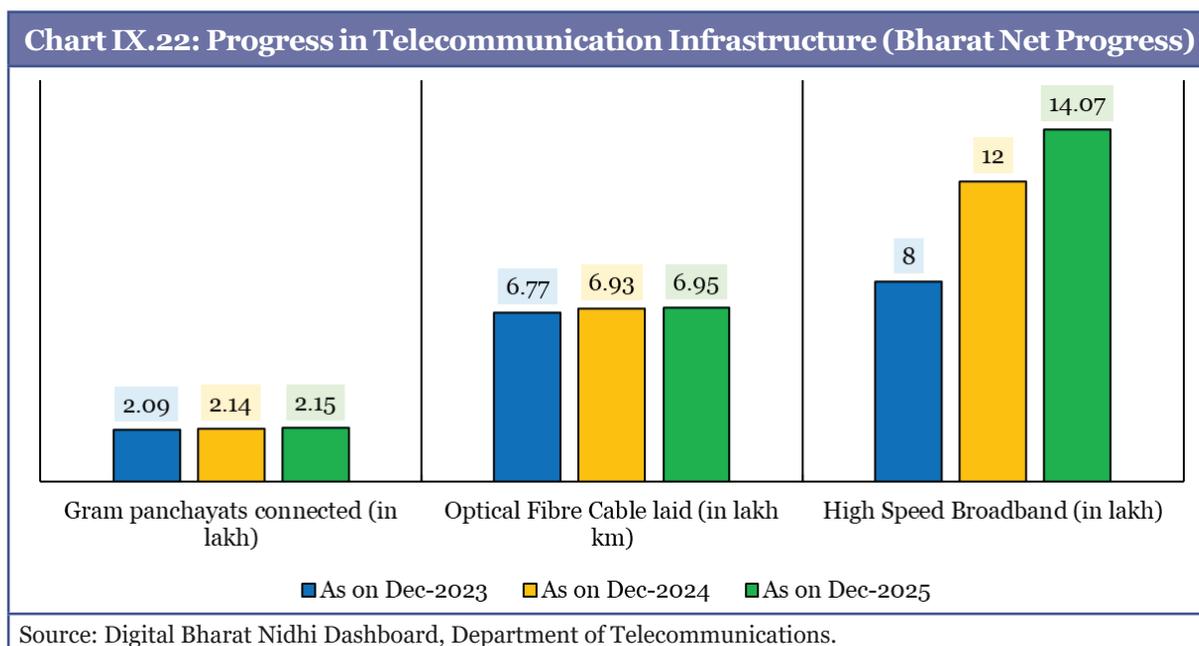
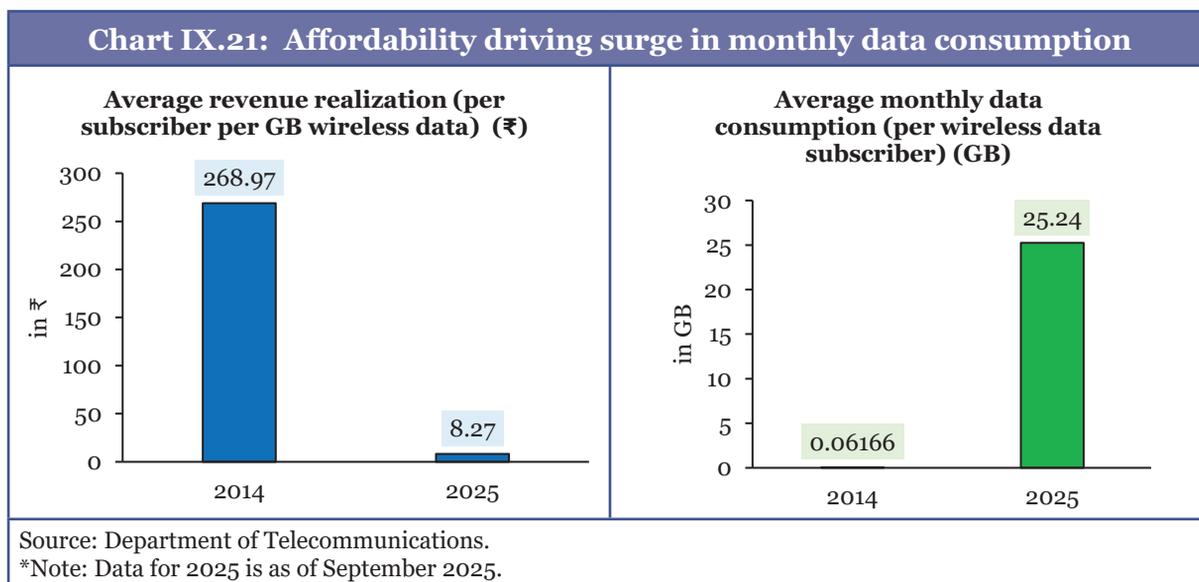
and transform), *Tvarit* (accelerated development and swift resolutions), and *Surakshit* (safe and secure).

9.45 As a result of these initiatives, India's telecommunications sector expanded rapidly over the last decade, accompanied by a sustained improvement in tele-density from 75.23 per cent to 86.76 per cent.<sup>31</sup> Growth in rural telephone connections outpaced urban growth, indicating a narrowing digital access divide. Furthermore, internet and broadband subscriptions have also witnessed a multi-fold growth over the last decade, underscoring the transition from basic connectivity to data-intensive digital usage across households and enterprises (Chart IX.19 and Chart IX.20).



9.46 Sharp declines in wireless data prices were associated with an exponential rise in average monthly data consumption, highlighting the role of affordability in driving mass digital adoption (Chart IX.21). Further, Network infrastructure was also strengthened to 31.87 lakh Mobile Base Transceiver Stations (BTS) and 8.48 lakh mobile towers as of December 2025. Key developments in the telecom sector are highlighted in Box IX.12.

<sup>31</sup> Department of Telecommunications.



### BOX IX.12: Key Developments in India's Telecom Sector

- Nationwide 5G Rollout:** 5G networks have been rolled out in all States/UTs across the country and presently 5G services are available in 99.9 per cent districts in the country, supported by 5.18 lakh 5G BTS. The rollout has been enabled by timely spectrum auctions, financial reforms to rationalize Adjusted Gross Revenue (AGR), Bank Guarantees and interest rates, removal of spectrum usage charges of those acquired in and after 2022, simplified procedure for Standing Advisory Committee on Radio Frequency Allocations (SACFA) clearances, the GatiShakti Sanchar portal and streamlined RoW (Right of Way) clearances.
- Advances in 5G/6G Innovation:** 100 5G Use Case Labs have been set up to promote research, skill development and start-up collaboration. As part of this initiative, 5G

Innovation Hackathon 2025 was also launched. Further, the Bharat 6G Vision (launched in 2023) and Bharat 6G Alliance (a collaborative platform) guide India's pathway toward global 6G leadership, focusing on research, development and standardisation of 6G technology.

- **Rural Connectivity Expansion:** For implementation of the project for saturation of 4G Mobile service approved in 2022, around 13,415 towers have been made functional, covering 19,901 villages, while the BharatNet project has provided broadband connectivity to 2.14 lakh Gram Panchayats through optical fibre cable and satellite media.
- **Strengthening Domestic Telecom Manufacturing:** The PLI Scheme launched in 2021 with an outlay of ₹12,195 crore, to boost domestic manufacturing of telecom products has attracted over ₹4,700 crore investments, enabled over ₹1,00,000 crore sales, including ₹21,000 crore exports and also has created around 30,000 jobs.
- **R&D and Technology Development Support:** Through the Digital Bharat Nidhi and the Telecom Technology Development Fund (TTDF), support has been extended to fund R&D in rural-specific communication technologies to promote indigenous telecom solutions. As of now, TTDF has approved 136 projects across 6G, SatCom, Open RAN, AI-in-Telecom, security, and other telecom technologies with ₹542.23 crore funding.
- **Citizen-Centric and Security Measures:** Initiatives such as Sanchar Saathi, Digital Intelligence Platform, ASTR- AI Driven Fraud Detection, and Financial Fraud Risk Indicator (FRI), International Incoming Spoofed Calls Prevention system and Device Setu Indian Counterfeited Device Restriction (ICDR) system are operational to strengthen telecom cyber security and enhance protection against telecom enabled frauds. These tools have detected and disconnected around 3.3 crore fraudulent connections, declined/generated alerts for around 90 lakh fraudulent financial transactions, preventing financial losses of approximately ₹660 crore.<sup>32</sup>
- **Efficient Infrastructure and Spectrum Management:** The centralized Right of Way (RoW) portal was launched in 2022 to address obstacles in telecom infrastructure deployment by reducing paperwork, transparent application processes, and streamlining approvals of Tower and OFC permissions in time-bound manner. It has reduced application processing time from 451 days in 2019 to 40 days in 2025, enabling the approval of 3.60 lakh applications. Spectrum reforms have also ensured optimal utilisation of spectrum and sufficient availability of spectrum for different radio communication services. The National Frequency Allocation Plan (NFAP)-2025 reflects evolving national and global requirements and provides the regulatory framework for efficient spectrum use in India. The Spectrum Roadmap for 6G Services, 2025 provides clear visibility on spectrum availability, quantum, and timelines across various radio frequency (RF) bands over the next decade.

## Information Technology

9.47 India's IT infrastructure underpins the expansion of digital governance, economic activity and advanced technologies. Data centres form a critical component

<sup>32</sup> *ibid.*

of this ecosystem, supporting application hosting, data processing and storage for government platforms, financial services, enterprises and citizen-centric applications. As per industry estimates, as of June 2025, India's installed data centre capacity stood at around 1,280 MW, with about 130 privately operated data centres and 49 data centres run by government agencies at the central and state levels.<sup>33</sup> Driven by rapid digitisation and the adoption of technologies such as cloud computing, artificial intelligence, IoT and 5G, data centre capacity is projected to expand further to around 4 GW by 2030 as per industry estimates. The sector remains largely private-led and deregulated, facilitated by policy initiatives under Make in India and Atmanirbhar Bharat to strengthen domestic electronics and semiconductor manufacturing across the data centre value chain.

9.48 To enable efficient and secure digital service delivery by government, the GI Cloud initiative, known as MeghRaj, has been launched to provide secure and scalable cloud-based ICT services to Central and State/UT government departments, enabling optimal use of IT infrastructure and faster deployment of e-Governance applications such as digital payments, identity verification, and consent-based data-sharing systems. As of December 2025, 26 Cloud Service Providers have been empanelled under MeghRaj.<sup>34</sup> Together, the expansion of data centre capacity and institutionalisation of cloud services are reinforcing India's digital infrastructure backbone and supporting the transition towards a digitally enabled economy.

## SOCIAL AND EMERGING SECTOR INFRASTRUCTURE

9.49 India's infrastructure development has increasingly transitioned towards a service-delivery-oriented paradigm, wherein physical assets are closely aligned with social outcomes, economic inclusion, and strategic capability building. This section reviews progress in strengthening last-mile delivery of essential services—particularly safe drinking water and water resources management—while also examining the expansion of tourism infrastructure as a key enabler of regional development. Further, it highlights advances in the space sector, where indigenous technological capabilities and growing private-sector participation are enhancing India's strategic resilience and reinforcing its presence in the global space economy.

### Rural Drinking Water and Sanitation

9.50 **Jal Jeevan Mission (Har Ghar Jal):** India has attained a significant milestone under the Jal Jeevan Mission, with over 81 per cent of rural households now having access to clean tap water.<sup>35</sup> As of 01 December 2025, more than 15.76 crore rural

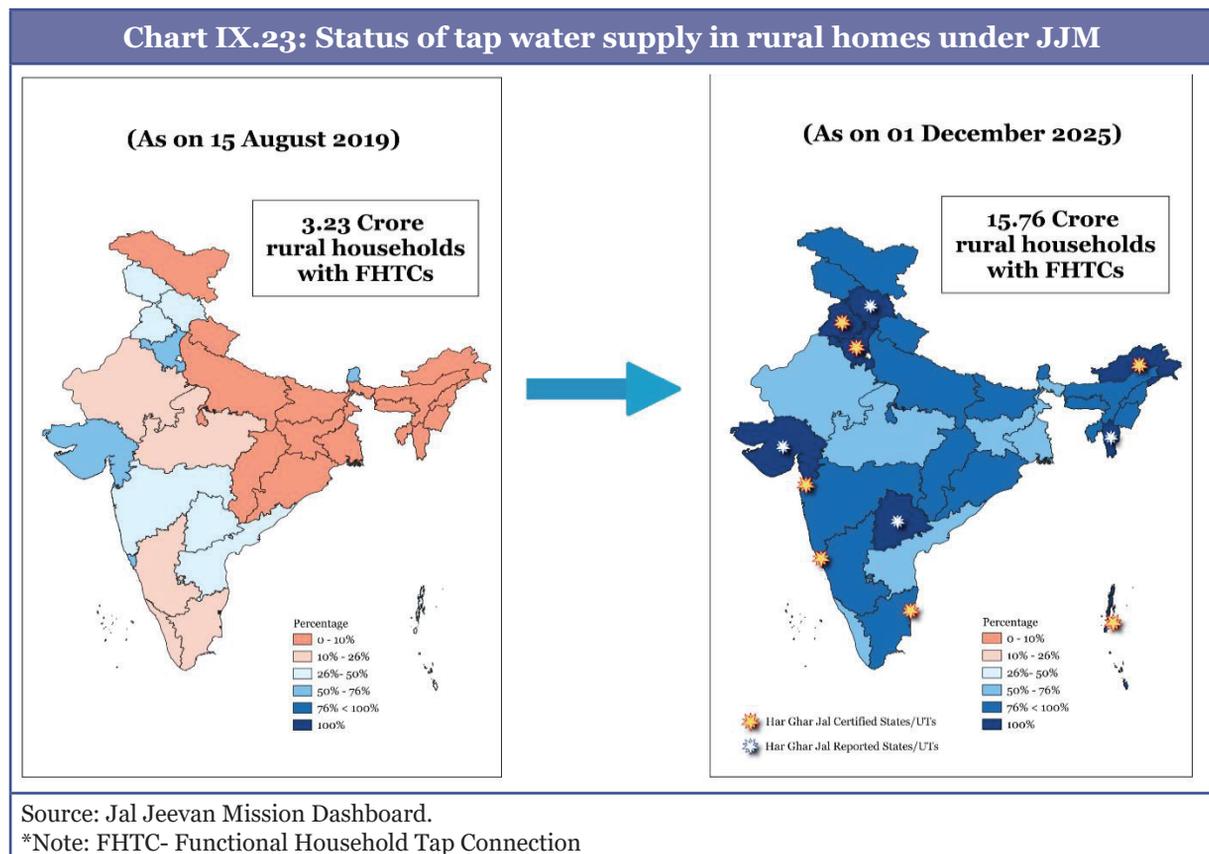
---

33 Ministry of Electronics and Information Technology.

34 PIB release available at <https://tinyurl.com/mthk2jxj>.

35 PIB release available at <https://tinyurl.com/yckymz2v>.

homes have received safe drinking water through household taps, marking a major step towards achieving universal water security in rural India.<sup>36</sup> The Mission, launched in 2019 and supported by an initial central outlay of ₹2,08,652 crore, has enabled States and Union Territories to implement water supply schemes, develop infrastructure, and promote efficient water management practices. In addition, it has strengthened local governance, enhanced community participation, and raised awareness on water conservation, thereby improving health, sanitation, and the overall quality of life in rural communities. To achieve 100 per cent coverage, the Mission has been extended until 2028 with an enhanced allocation of ₹67,000 crore in the Union Budget 2025-26.<sup>37</sup>



## Water Resources Management Sector

9.51 **The Namami Gange Programme** is a comprehensive river-conservation initiative aimed at rejuvenating the Ganga basin. It focuses on ensuring clean (Nirmal Dhara) and continuous (Aviral Dhara) flow, restoring natural habitats, reviving biodiversity, and promoting sustainable water governance through integrated infrastructure and community participation.

<sup>36</sup> Jal Jeevan Mission Dashboard accessed on 01 December 2025 at <https://tinyurl.com/yfujh6ty>.

<sup>37</sup> PIB Release available at <https://tinyurl.com/zcbf3euf>.

9.52 To ensure long-term operational efficiency, the program has pioneered the Hybrid Annuity Model (HAM-PPP) for Sewage Treatment Plants (STPs). By linking payments to verified performance, this model ensures the sustainability of assets. Furthermore, the ‘One City One Operator’ model has been successfully institutionalised in major urban hubs like Kanpur and Prayagraj to streamline operations. In land-constrained geographies such as Muni Ki Reti, Rishikesh, the deployment of vertical STPs highlights the program's focus on space-efficient engineering. Further, Green STPs powered by solar and biogas energy are reducing the carbon footprint of waste management. Complementing this, afforestation across 33,024 hectares along the Ganga corridor has bolstered riverbank stability, enhanced carbon sequestration, and strengthened climate resilience.

9.53 The improvement in the river's ecological health is evident from the significant increase in the Gangetic Dolphin population, which increased from approximately 3,500 in 2015 to 6,327 as per the 2021–2023 nationwide assessment. Further, 20 Red-Crowned Roofed Turtles were reintroduced into the basin in April 2025, marking a shift towards ecological restoration alongside pollution abatement.<sup>38</sup> Key achievements and initiatives in the water resources management sector are highlighted in Box IX.13.

#### **BOX IX.13: Key achievements and initiatives in water resource management**

- **Modernization of Command Area Development (M-CADWM):** Launched on a pilot basis for FY26 under Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), with the aim to provide assured irrigation, promote efficient water use, and encourage participatory governance through Water User Societies (WUS). It leverages Supervisory Control and Data Acquisition (SCADA) and Internet of things (IoT) technology for water accounting and management.
- **C-Flood Platform:** Unified Inundation Forecasting System developed by Centre for Development of Advanced Computing (C-DAC) and the Central Water Commission (CWC), provides two-day advance village-level flood forecasts. Integrating multi-agency models, it currently monitors the Mahanadi, Godavari, and Tapi basins to mitigate disaster risks.
- **National Register of Specified Dams 2025:** The updated register includes data on 6,628 dams, strengthening planning and dam-safety systems.
- **River Cities Alliance (RCA) – Action Plan 2025:** A collaborative initiative between Ministry of Housing and Urban Affairs (MoHUA) and the National Mission for Clean Ganga (NMCG), the RCA has expanded from 30 to 145 cities. The 2025 Plan prioritizes river-sensitive urban planning and the formulation of 60 Urban River Management Plans.

<sup>38</sup> Department of Water Resources, River Development and Ganga Rejuvenation.

- **National Water Resource Censuses:** Four national surveys—the 7<sup>th</sup> Minor Irrigation Census, 2<sup>nd</sup> Census of Water Bodies, 1<sup>st</sup> Census of Major & Medium Irrigation Projects, and 1<sup>st</sup> Census of Springs—are underway to enable evidence-based policymaking and precise resource mapping.

## Tourism

9.54 The Government of India has revamped the Swadesh Darshan scheme as Swadesh Darshan 2.0 (SD 2.0), aimed at developing sustainable and responsible tourism destinations. Under this initiative, 53 projects worth ₹2,208.87 crore have been sanctioned across various States/UTs. Additionally, under the Challenge-Based Destination Development (CBDD) sub-scheme, 38 projects in 24 States/UTs have been approved with a total allocation of ₹697.68 crore. Both SD 2.0 and CBDD focus on providing enhanced tourism experiences and improved amenities at major destinations.<sup>39</sup>

9.55 The National Mission on Pilgrimage Rejuvenation and Spiritual, Heritage Augmentation Drive (PRASHAD) has been launched as a Central Sector Scheme to support integrated development of selected pilgrimage and heritage sites. The scheme aims at infrastructure development including upgradation of tourist arrival areas with tourist facilitation centres, approach roads and parking, provision of basic amenities and development of utility infrastructure such as solid waste management, water supply, and sanitation, landscaping, etc. Total of 54 projects have been sanctioned in 28 States/UTs, with an estimated cost of ₹1,726.74 crore, since its launch in January 2015.<sup>40</sup>

## Space Sector

9.56 India currently operates 56 active space assets, including 20 communication satellites, eight navigation satellites, four scientific satellites, 21 earth observation satellites and three technology demonstration missions.<sup>41</sup>

9.57 The year 2025 has witnessed a significant achievement of India's space program, characterized by indigenous technological breakthroughs and expanded global footprints. India became the fourth nation to achieve autonomous satellite docking via the SpaDeX (Space Docking Experiment) mission. Additionally, the GSLV-F15 with indigenous Cryogenic stage launched the NVS-02 satellite on 29 January 2025, marking the 100<sup>th</sup> lift-off from Sriharikota. Global collaboration reached new heights with the successful completion of the Axiom-04 mission in July 2025, which saw an

<sup>39</sup> Ministry of Tourism.

<sup>40</sup> *ibid.*

<sup>41</sup> Department of Space.

Indian astronaut conduct microgravity experiments aboard the International Space Station. This synergy was further reinforced by the launch of NASA ISRO Synthetic Aperture Radar Mission (NISAR), a global, microwave imaging mission, in July 2025. In December 2025, the LVM3-M6 vehicle successfully injected the BlueBird Block-2 communication satellite in the intended orbit —the heaviest payload to be placed into the Low Earth Orbit (LEO) in Indian space history,<sup>42</sup> bolstering the nation's strategic infrastructure.

9.58 Further, ISRO's advanced geospatial platforms are significantly strengthening infrastructure monitoring and management for various sectors in India. Through the Bhuvan platform, high-resolution Cartosat imagery is used to geotag and monitor 296 watershed development activities under PM Krishi Sinchayee Yojana 2.0 (PMKSY 2.0), and to monitor vegetation and green cover along national highways across the country. The Yuktdhara platform supports decentralised planning by enabling the monitoring of labour-driven natural resource management works. For urban water management, the Urban Water Information System (UWIS), a web-GIS decision support tool, has been developed for groundwater sustainability and monitoring in 10 AMRUT cities. ISRO's Remote sensing enabled Online Chemical Emergency Response System (ROCERS) has been developed to monitor major hazardous industries by establishing network of chemical sensors and automatic weather stations to facilitate real time alerts. Additionally, in continuation to the large scale 2-D urban geospatial database for 238 Class-1 cities, database for 71 Class-II towns (AMRUT 2.0) is being created to support GIS-based master planning by Urban Local Bodies.

#### BOX IX.14: Enhancing Private Participation in the Space Sector

The Space Sector Reforms of 2020, followed by the Indian Space Policy–2023, have created a structured and forward-looking framework to enable private-sector participation and enhance India's role in the global space economy. Recent achievements and key initiatives to promote private participation in the sector include:

- Emergence of 300+ space start-ups contributing to innovations across space technologies and services.
- IN-SPACe functioning as a single-window agency to promote, regulate, and authorize activities of Non-Governmental Entities (NGEs), ensuring streamlined governance.
- Liberalised FDI policy, allowing up to 100 per cent foreign investment through the automatic route in less sensitive categories, with graded caps (up to 74 per cent or 49 per cent) for sensitive segments.
- The Union Cabinet approved a ₹1,000 crore venture capital fund under IN-SPACe in October 2024 and launched a ₹500 crore Technology Adoption Fund in February 2025 to accelerate space start-ups and technology-led growth.

<sup>42</sup> ISRO <https://tinyurl.com/yzw7z8hz>.

- Successful sub-orbital launches were done by companies such as M/s Skyroot Aerospace and M/s Agnikul Cosmos in 2023 and 2024 respectively.
- Successful launch of satellites by NGEs such as Pixxel Space, Azista, Hex20, and TakeMe2Space, indicate rising indigenous capabilities.
- 70+ technology transfers from ISRO to private industry, supporting commercialization and scale-up.
- Establishment of a dedicated launch pad and integration facility at Kulasekarapattinam, Tamil Nadu is underway which will strengthen India's launch infrastructure.

9.59 **Outlook:** Aligned with India's Space Vision 2047, the Government has set ambitious targets, including establishing the Bharatiya Antariksh Station by 2035 and conducting India's first manned lunar mission by 2040. Towards this, Government has approved five key projects: the Gaganyaan follow-on mission, which will pave the way for the establishment of the first module of the Bhartiya Antariksh Station; the Chandrayaan-4 Lunar Sample Return Mission; the Chandrayaan-5/LUPEX mission (Lunar Polar Exploration Mission); the Venus Orbiter Mission; and the development of the Next Generation Launch Vehicle. These initiatives aim to enhance India's technological capabilities, foster industry collaboration, and strengthen the country's position in global space exploration.

## CONCLUSION

9.60 India's infrastructure strategy over recent years reflects a decisive shift towards scale, integration and quality, with sustained public capital expenditure acting as a powerful catalyst for growth. Coordinated investments across roads, railways, ports, civil aviation, energy, digital and rural infrastructure have begun to yield tangible efficiency gains—shorter travel times, faster freight movement, improved logistics performance and wider access to essential services. The institutionalisation of integrated planning through PM GatiShakti, alongside reforms in financing, asset monetisation and public-private partnerships, has strengthened project preparation and execution while crowding-in private investment.

9.61 Improvements in transport connectivity are enhancing ease of travel for people and businesses by reducing travel times, lowering transaction costs and expanding access to markets. Enhanced multimodal integration and more reliable freight movements are strengthening regional integration and improving the competitiveness of the Indian economy by enabling firms to participate more effectively in domestic and global value chains.

9.62 At the same time, the concept of infrastructure is evolving beyond physical networks to encompass digital public infrastructure, clean energy systems, resilient water management and future-ready technologies. This widened infrastructure base is also enhancing productivity, competitiveness, innovation and sustainability across the economy. Looking ahead, maintaining investment momentum, deepening private participation and aligning infrastructure development with emerging priorities—such as decarbonisation, digitalisation and resilience—will be critical. Together, these efforts position infrastructure as a central pillar of India’s medium-term growth strategy and a key enabler of its long-term development vision under *Viksit Bharat @2047*.

\*\*\*

# ENVIRONMENT AND CLIMATE CHANGE: BUILDING A RESILIENT, COMPETITIVE AND DEVELOPMENT-DRIVEN INDIA



*India aims to become a developed nation by 2047, which requires achieving high, inclusive, and environmentally sustainable growth. This will necessitate a transformation in consumption and production patterns, as well as technological and policy reforms. Mission LiFE (Lifestyle for Environment) emphasises the importance of behavioural changes and citizen participation in India's approach to climate action and sustainability, working alongside government-led mitigation and adaptation efforts.*

*Although India's per capita emissions remain well below the global average, climate change poses risks to livelihoods, infrastructure, and economic stability. Adaptation is, therefore, central to India's climate strategy, driven primarily by public investment and community-based action. The chapter examines how State Action Plans on Climate Change integrate water security, resilient livelihoods, urban resilience, and ecosystem restoration into development objectives, ensuring that development gains are sustained.*

*India is also pursuing a balanced mitigation pathway, scaling renewables, battery storage, and nuclear energy in line with the objective of energy security and industrial competitiveness. However, inadequate global capital flows to developing countries remain a significant constraint, underscoring the need to reform multilateral financial institutions and to strengthen domestic financial systems. The chapter further reviews the evolution of environmental regulations and their role in enabling sustainable development.*

## INTRODUCTION

10.1 The global climate change agenda has reached an inflexion point. What was once framed as a straightforward moral and technological transition toward a net-zero future is today marked by complex trade-offs, capacity constraints and a widening gap between ambition and operational reality. Nowhere is this tension more visible than in parts of Europe, which have presented themselves as the vanguard of the energy transition but are now confronting the practical and institutional stresses that follow from rapid decarbonisation undertaken ahead of grid readiness, storage depth, and industrial

system resilience.<sup>1</sup> These developments matter deeply for emerging economies such as India because they reveal the structural nature of transition risk, the importance of sequencing, and the consequences of allowing complexity to outpace institutional capacity.

10.2 Europe's recent experience illustrates these pressures in a particularly striking way. In the Netherlands, celebrated as a leader in renewables and electric mobility, the rapid deployment of solar and wind energy has collided with a distribution network designed for an earlier era of centralised thermal generation.<sup>2</sup> The result has been congestion, curtailment, and long waiting times for industrial connections, as well as appeals to households to moderate evening consumption to avoid overloading the system. The challenge here is not ideological, but infrastructural: renewable capacity has expanded faster than balancing systems, transmission reinforcement and storage technologies. The consequence is that intermittency-related costs — from maintaining thermal reserves to the capital burden of grid upgrades — are felt in both reliability stress and headline tariffs.

10.3 A similar story is visible elsewhere. On 28th April 2025, Spain<sup>3</sup> experienced a widespread grid disruption triggered by a combination of network instability during a period of high renewable energy output and transmission system sensitivity under shifting load conditions. The result is that intermittency-related costs — from maintaining thermal reserves to the capital burden of grid reinforcement — increasingly surface not through higher tariffs but through episodes of reliability stress and tighter operating margins. This isn't criticism of renewable energy itself; it's a reminder that if we introduce complex systems too quickly without buffers, redundancy and institutional capacity, the system is likely to become fragile instead of thriving.

10.4 Taken together, these strands of evidence point to a common lesson: transitions are more durable when sequencing, system buffers and institutional depth are treated as intrinsic elements of design rather than assumed to follow. This is especially salient for emerging economies, where growth, energy security and resilience must advance alongside low-carbon pathways, and not be displaced by it.

10.5 Across several advanced economies, these stresses follow a common pattern: storage lags investment commitments, balancing costs rise, and transmission

---

1 Damen, M. (2023). Four challenges of the energy crisis for the EU's strategic autonomy (EPRS Briefing No. PE 747.099). European Parliamentary Research Service. Retrieved December 28, 2025, from <https://tinyurl.com/2kcea6p8>.

2 Laurenson, J. (2025, October 16). Netherlands' renewables drive putting pressure on its power grid. Bloomberg. Retrieved on December 20, 2025 from: <https://tinyurl.com/38bnb89j>

3 Bloomberg. (2025, July 16). Spain blackout investigation shows EU grids need more resilience. Bloomberg News. Retrieved December 29, 2025, from <https://tinyurl.com/4f342ahs>.

bottlenecks multiply. The result is what may be described as an entropy effect, in which well-intentioned transition strategies inadvertently increase systemic volatility unless accompanied by buffers, redundancies and stabilising structures.

10.6 This pattern underscores a broader lesson. In the early years after the Paris Agreement, there was a disproportionate emphasis on renewable energy capacity additions, procurement targets, and signalling ambition, while underestimating the engineering and financial challenges of maintaining stability in grids dominated by intermittent generation. The real cost of renewable power at scale includes storage, reserve capacity, balancing operations and transmission reinforcement. When these remain implicit rather than explicit, the policy narrative tends to understate the degree of institutional preparation required for a reliable and just transition.

10.7 More recently, the broader global climate discourse has undergone a gradual shift toward greater realism. Policymakers and assessment institutions have become more attentive to the distinction between what climate science can state with high confidence and what remains subject to uncertainty, natural variability and modelling limitations. The evidence from official assessments indicates that while the planet has warmed and human activity exerts a measurable warming influence, the translation of these findings into deterministic or catastrophic policy narratives often compresses nuance and downplays uncertainty. A more careful reading suggests that climate risk — though serious — is best addressed through measured, evidence-based strategies that preserve energy security, competitiveness and social stability, rather than through alarmist framings that may weaken institutional credibility or crowd out legitimate policy trade-offs.

10.8 A complementary body of empirical work<sup>4</sup> points in a similar direction, underscoring the value of calibrated interpretation when translating climate evidence into policy and design. The Intergovernmental Panel on Climate Change (IPCC)'s 2021 release of local sea-level projections has been an important step for infrastructure and adaptation planning; however, a recent global comparison with tide-gauge observations suggests that only a small proportion of locations worldwide records of sufficient length and continuity for robust estimation. Across this subset, nearly 95 per cent of sites show no statistically significant acceleration in sea-level rise, and projected rates are, on average, about two millimetres per year higher than those observed, with the limited instances of acceleration largely associated with local, non-climatic factors, such as subsidence or land-use-driven ground movement.<sup>5</sup> The implication is not to downplay

4 Voortman, H.G.; De Vos, R. A Global Perspective on Local Sea Level Changes. *J. Mar. Sci. Eng.* 2025,13, 1641. <https://doi.org/10.3390/jmse13091641> Retrieved on 20 January 2026 from <https://tinyurl.com/2xnb27pd>.

5 Voortman, H. G., & De Vos, R. (2025). A Global Perspective on Local Sea Level Changes. *Journal of Marine Science and Engineering*, 13(9), 1641. <https://doi.org/10.3390/jmse13091641> Retrieved on 20 January 2026 from <https://tinyurl.com/2xnb27pd>.

climate risk, but to highlight the need for context-specific assessment and institutional prudence in operationalising projections.

10.9 This more balanced perspective aligns with the argument advanced in Bill Gates' reflections ahead of the Conference of the Parties (COP)30.<sup>6</sup> The central theme is that climate policy should prioritise human welfare, particularly for poorer and climate-vulnerable societies. Climate change will have meaningful consequences, but it is unlikely to produce civilisational collapse; innovation, declining green-cost premia and targeted investments are more durable low-carbon pathways than rapidly imposed constraints that erode growth. Equally, scarce fiscal resources should not be diverted away from health, agriculture and poverty reduction merely to accelerate near-term mitigation milestones. Growth and prosperity strengthen resilience and reduce vulnerability, and must therefore be treated as complementary to climate strategy rather than competing with it.

10.10 Taken together, these perspectives reinforce an important ethical and strategic principle: **development is, in itself, a form of adaptation**. While emissions mitigation is also important, effective climate action encompasses much more; it also depends on improving societal capacity to withstand shocks through stronger health systems, climate-resilient infrastructure, enhanced agricultural productivity, and access to affordable and reliable energy. Measured in terms of human welfare rather than temperature outcomes alone, the most effective strategies are those that expand opportunity while reducing vulnerability, remaining transparent about uncertainties and pragmatic about the limits of what climate science can presently resolve with confidence.

10.11 For India, these developments carry important implications. Achieving sustained growth and rising living standards will require a substantial expansion in the supply of affordable and reliable electricity. Renewable energy will play a major and growing role in this expansion; however, capacity additions alone do not automatically translate into a dependable supply, particularly at non-solar peak times or during periods of high variability. As renewable penetration rises, the cost of maintaining dispatchable thermal capacity increases, even as utilisation declines, while grid stability challenges intensify. India must, therefore, approach the coming decade not as a climate policy problem in isolation, but as a broader energy system strategy — one that sequences the transition in line with growth, security, and institutional preparedness.

10.12 Such a strategy must prioritise pragmatism over signalling: maintaining sufficient dispatchable power capacity to support industrialisation and social development even

6 Gates, B. (2025, October 28). Three tough truths about climate. Gates Notes. Retrieved December 29, 2025, from <https://tinyurl.com/mryd8455>.

as renewables scale; strengthening transmission and distribution; investing in storage and grid-management technologies; and restoring emphasis on hydro and nuclear as long-horizon anchors for low-carbon development. Internationally, India's negotiating stance must remain grounded in first principles — predictable and front-loaded finance reflecting full-system costs, technology flows that support resilience rather than compliance, and commitments that respect differentiated capabilities, responsibilities and risk exposures.

10.13 Advanced economies have been the first to discover that decarbonisation at scale is an engineering, financial and institutional undertaking with unavoidable trade-offs. Their experience does not diminish the urgency of climate action; rather, it clarifies the conditions under which it can be sustained. For India, the lesson is to articulate, calmly and firmly, a pathway that protects growth, builds resilience and preserves strategic flexibility, while remaining committed to responsible climate action on terms that are technologically feasible, developmentally coherent and compatible with India's economic aspirations.

10.14 India has grown sustainably with per capita carbon emissions considerably lower than the global average.<sup>7</sup> India's climate action strategy has developed around three main pillars. Firstly, adaptation needs to be at the forefront given the country's significant vulnerability to physical impacts of climate change, such as the loss of life and property and health concerns due to intensification of extreme weather events, concerns of water and food security, slow-onset events like rising sea-level, amongst others.<sup>8</sup> Prioritising adaptation not only addresses immediate climate challenges but also provides local economic benefits by protecting livelihoods, safeguarding infrastructure investments, and minimising disaster-related losses. This approach is largely realised through public investments initiated by the central government, strategic planning at the state level, and community-driven programs woven into broader development efforts.

10.15 Secondly, India is also taking mitigation action by phasing-in renewables, improving energy efficiency and diversifying energy sources to green hydrogen and nuclear power. The approach is to prioritise energy security, affordability and industrial competitiveness. However, this transition faces various intertwined challenges, including limited access to advanced technologies, vulnerabilities in supply chains for critical minerals essential for clean energy, and constrained availability of reliable and affordable financial capital.

7 India's per capita GHG emissions for 2024 have been estimated to be 2.9 t/person vis-à-vis GHG average of 6.7 t/person in Per capita greenhouse gas emissions. (2025, November 13). Our World in Data. Retrieved December 26, 2025, from <https://tinyurl.com/bdeazps2>.

8 Initial Adaptation Communication: National Communication (NC). NC 3. (2023). In UNFCCC. Retrieved December 26, 2025, from <https://unfccc.int/documents/636235>.

10.16 Thirdly, a predominant reliance on domestic resources as international climate finance and international financial regulation has both become binding constraints. While global capital is abundant, it does not flow at scale to developing countries due to structural features of the international financial system and risk perceptions, resulting in a high cost of capital. In recent years, India has made significant progress in enhancing its financial ecosystem through regulatory reforms. The country has streamlined its financial markets and introduced innovative instruments for sustainable finance, including frameworks for thematic bonds like green, blue, yellow, transition, social, sustainability to support sustainable development goals including interventions to address climate action projects. Sovereign green bonds have backed public sector initiatives focused on environmentally friendly projects, while a green deposit framework emphasises mobilising capital for sustainability. Additionally, specialised financial institutions are playing a vital role in aligning the financial sector with the nation's climate sustainability goals.

10.17 Internationally, there's a growing need to reform multilateral development finance,<sup>9</sup> credit ratings,<sup>10</sup> and the use of risk-sharing instruments.<sup>11</sup> At the same time, environmental regulation in India is transitioning from procedural, command-and-control approaches toward risk-based, technology-enabled, and outcome-oriented governance that supports both environmental protection and ease of doing business.

10.18 Against this backdrop, this chapter examines India's national and subnational strategies across adaptation, mitigation, climate finance, and regulation; it underscores the importance of Mission-LiFE as a cross-cutting theme and draws lessons for policy design and economic planning. It highlights how climate action, when embedded in development priorities, can strengthen resilience, enhance competitiveness, and support India's long-term growth trajectory.

10.19 The rest of the chapter is organised as follows: The second section focuses on adaptation measures, highlighting the actions taken by the Government of India and various subnational initiatives that address a range of local needs. The third section discusses mitigation strategies, including India's renewable energy imperatives, access to critical minerals, the political economy of the transition, and the new Carbon Credit Trading Scheme. The fourth section addresses Mission LiFE and its implementation

---

9 Lahn, G., & Schröder, P. (2023, September 21). If the SDGs are to survive, multilateral development banks must embrace reform. Chatham House. Retrieved December 26, 2025, from <https://www.chathamhouse.org/about-us/our-people/patrick-schroder>

10 Rating the globe: reforming credit rating agencies for an equitable financial architecture. (2025, March 6). United Nations University. Retrieved December 26, 2025, from <https://tinyurl.com/bdd763ha>.

11 Laxton, V., Alayza, N., & Neunuebel, C. (2025, June 29). 4 ways financing for development can deliver for people, nature and climate. World Resources Institute. Retrieved December 28, 2025, from <https://tinyurl.com/mr2am9xc>.

across different sectors. The fifth section covers climate finance, detailing the steps India is taking to mobilise resources for climate action. Finally, the sixth section examines the evolution of environmental regulations and the measures being implemented to enhance its effectiveness. The chapter concludes with key lessons and recommendations for future action.

### **Adaptation: Strengthening climate resilience**

10.20 Given our country’s vulnerability to climate change, action is necessary to ensure continuing economic stability, secure and enhanced livelihoods, and to protect infrastructure from risks such as droughts, floods, and rising sea levels. Integrating climate adaptation and resilience into development plans is essential for sustainable growth.<sup>12</sup> Unlike mitigation, adaptation offers immediate benefits by reducing losses, stabilising incomes, locking in development and safeguarding investments, helping us build a more resilient future.

10.21 Despite the urgency for adaptation, international and private capital flows remain constrained and disproportionately skewed towards mitigation efforts. The 2025 Adaptation Gap Report estimates that developing countries will require between USD 310 billion and USD 365 billion annually by 2035, whereas the current flow of international public adaptation finance to developing countries is approximately USD 26 billion.<sup>13</sup> The Economic Survey for 2024–25 emphasised the importance of integrating climate adaptation into our policy-making process. This Chapter provides further details on this subject with specific reference to the sub-national measures, acknowledging that the challenges posed by climate change and the ways to tackle them are often unique to specific locations and communities.

### **Public Investment–Led Climate Adaptation in India**

10.22 India’s climate adaptation strategy is predominantly advanced through a development-led approach, utilising domestic public investment in core development sectors. Adequate and sustained financing is the backbone of effective adaptation and resilience-building in India. Scaling up existing adaptation actions and addressing the substantial financing gap requires diversified resource mobilisation. Reflecting a strategic pivot towards self-funded resilience, India mainstreams adaptation through national and state-level planning backed by domestic resources. India’s adaptation and resilience-related domestic spending surged from 3.7 per cent of the GDP in FY16

12 IMF. (2025). India 2025 Article IV consultation: Press Release; Staff Report; Staff Statement; And Statement by the Executive Director for India. Retrieved December 26, 2025, from <https://tinyurl.com/ye6mm956>.

13 ‘United Nations Environment Programme. (2025). Adaptation gap report 2025: Running on empty - The world is gearing up for climate resilience – without the money to get there. Retrieved on December 15, 2025, from <https://tinyurl.com/mrcpsm2a>.

to 5.6 per cent of the GDP in FY22.<sup>14</sup> The National Action Plan on Climate Change (NAPCC)<sup>15</sup> spearheads climate action through nine missions – on solar energy, energy efficiency, sustainable habitats, water management, the Himalayan ecosystem, green India, sustainable agriculture, and strategic knowledge for climate change and health - implemented by the respective nodal ministry/department. Many of these are focused on adaptation.

10.23 The National Mission on Sustainable Agriculture<sup>16</sup> promotes climate-resilient farming through initiatives such as "Per Drop More Crop," which focuses on efficient water use, Rainfed Area Development for integrated farming, and Soil Health Management supported by the Soil Health Card scheme. In the area of water management, the National Water Mission emphasises conservation and fair access through integrated resource management. It supports State-Specific Plans and rainwater harvesting initiatives, providing financial help to States and Union Territories. The National Programme on Climate Change and Human Health raises awareness about health impacts from climate change and aims to strengthen health systems, particularly for vulnerable groups. The National Mission on Sustainable Habitat integrates adaptation into urban development through programs such as the Swachh Bharat Mission and urban transport initiatives, thereby enhancing climate resilience and liveability.

10.24 India has adopted an integrated approach to coastal and marine resilience, linking ecosystem protection with livelihood security and climate adaptation. The National Coastal Mission strengthens integrated coastal zone management and climate-resilient infrastructure, thereby directly reducing the vulnerability of coastal communities to sea-level rise and extreme weather events. Complementing this, the Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI) envisages the restoration and reforestation of mangroves over approximately 540 square kilometres across nine coastal States and four Union Territories over a five-year period (2023–2028). The programme is implemented through convergence with existing schemes and programmes, enabling states to integrate mangrove restoration within ongoing development efforts. MISHTI is expected to generate around 22.8 million person-days of employment, create an estimated carbon sink of 4.5 million tonnes, and unlock opportunities for nature-based tourism and sustainable livelihoods for coastal communities.<sup>17</sup> In parallel, the National Plan for Conservation of Aquatic Ecosystems

14 Initial Adaptation Communication: National Communication (NC). NC 3. (2023). In UNFCCC. Retrieved December 26, 2025, from <https://unfccc.int/documents/636235>.

15 Press Information Bureau. (2025, July 24). Parliament Question: - Measures related to climate change. Retrieved on December 15, 2025 from <https://tinyurl.com/2tph4nj3>.

16 Department of Agriculture & Farmers Welfare. (2025). Rainfed farming system: National Mission for Sustainable Agriculture (NMSA). Government of India. Retrieved December 28, 2025, from <https://tinyurl.com/3ymvyym>.

17 Press Information Bureau. (2023, June 05). World Environment Day 2023 celebrated with a thrust on Mission LiFE. Retrieved on December 24, 2025, from: <https://tinyurl.com/4c2vwdje>.

has expanded protected wetlands that support flood moderation and water security—critical buffers under climate stress. Together with Mission LiFE, which promotes behavioural adaptation and mindful resource use, these initiatives reflect a shift toward ecosystem-led, development-integrated climate resilience.

10.25 In India’s federal framework, climate adaptation is advanced through coordinated action across national, state, and local levels. National frameworks and programmes provide policy coherence, financial support, and institutional mechanisms, while States contextualise and operationalise these interventions through sectoral policies, public programmes, and local institutions. These have played a critical role in enhancing development and environmental conservation activities that promote ecological restoration and strengthen rural-urban infrastructure. The Viksit Bharat – Guarantee for Rozgar and Ajeevika Mission (Gramin) (VB-G RAM G) Act, 2025, aims to strengthen the interventions. Details are covered in **Chapter XIII Rural Development**.

#### Box X.1: Kerala Climate Resilient Agri-Value Chain Modernisation Project (KERA)<sup>18</sup>

The Government of Kerala, with support from the World Bank, is implementing the Kerala Climate-Resilient Agri-Value Chain Modernisation (KERA) Project to build a climate-resilient, competitive, and market-oriented agricultural sector. With an outlay of USD 285 million (₹2,365 crore), the project aims to enhance climate resilience, boost productivity, promote value addition, and strengthen market linkages across priority agri-value chains, directly benefiting over 400,000 farmers statewide.

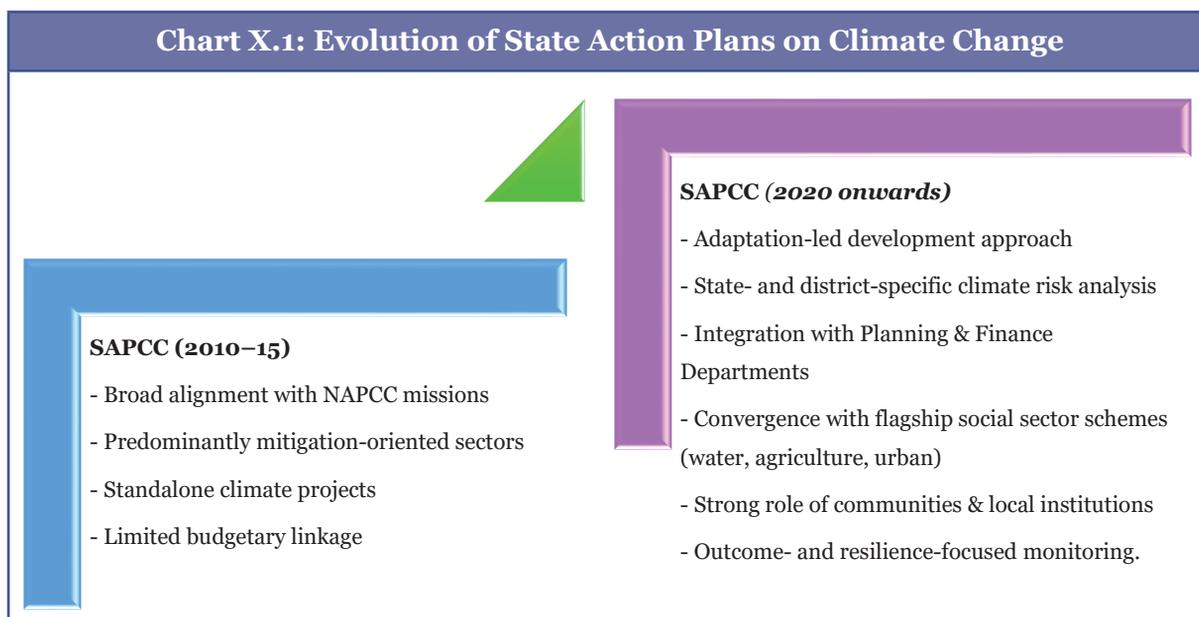
KERA is structured around three core components. First, it promotes climate-resilient and low-carbon cultivation processes as a co-benefit of mitigation. Second, it supports smallholder commercialisation by facilitating up to 150 Productive Alliances between Farmer-Producer Companies (FPCs) and agribusinesses, with grants of up to ₹2 crore per alliance, alongside support for replantation of certified climate-resilient varieties of coffee, cardamom, and rubber. Third, the project strengthens agri-food MSMEs and agri-tech start-ups through grants to about 200 MSMEs (up to ₹1.5 crore each), support to 150 agri-tech start-ups, and the development of agri-parks and food parks to enable cluster-based growth.

Implemented across all 14 districts of Kerala, KERA focuses on measurable outcomes—higher farm incomes, enterprise growth, job creation, and improved resilience to climate shocks—while ensuring inclusive participation of small and marginal farmers, women-led enterprises, FPCs, and rural entrepreneurs.

10.26 Further, states play a crucial role in planning and implementing adaptation strategies to address climate change. The State Action Plans on Climate Change (SAPCCs) are crucial tools for translating NAPCC's broader objectives into actionable steps. These plans are tailored to the specific needs of different regions, whether they are

18 Inputs received from the Government of Kerala.

vulnerable coastal areas or unique Himalayan ecosystems. Initially, the SAPCCs placed a strong emphasis on mitigation efforts to reduce emissions. Recent revisions of SAPCCs<sup>19</sup> reflect a gradual shift towards adaptation-led development, with increasing emphasis on contextual risk considerations, sectoral vulnerabilities, and alignment with district-level development priorities, where available. Overall, it is about making our responses to climate change more robust and better aligned with the unique challenges faced by each region.



### Subnational initiatives on adaptation through an ecosystem-based approach and Institutional Innovations

10.27 The case studies depicted below illustrate how adaptation has evolved from stand-alone projects to integrated, growth-supporting national resilience strategies.

**10.28 Meghalaya – Ecosystem-Based Water Security and Climate Adaptation<sup>20</sup>:** Meghalaya is experiencing increasing concerns about water security, with water flow at nearly half of the state’s springs either dried up or showing a significant reduction in water discharge. To address this, the state has embraced a community centric adaptation strategy, which includes interventions such as the Protection of Vulnerable Catchment Areas in Meghalaya (MegARISE), the Spring Mapping Initiative, and the Climate-Adaptive Community-Based Water Harvesting Project. The MegARISE project aims to enhance water availability and security by protecting critical catchment areas

19 Kerala - <https://envt.kerala.gov.in/wp-content/uploads/2022/12/Kerala-State-Action-Plan-on-Climate-Change-2.0.pdf>. Punjab - [https://ncdc.mohfw.gov.in/wp-content/uploads/2025/01/24\\_SAPCCHH\\_Punjab\\_21-10-24.pdf](https://ncdc.mohfw.gov.in/wp-content/uploads/2025/01/24_SAPCCHH_Punjab_21-10-24.pdf). Uttar Pradesh - [https://upccce.org/public/UPLOADS/REPOSITORY/DOC/27\\_stateactionplan.pdf](https://upccce.org/public/UPLOADS/REPOSITORY/DOC/27_stateactionplan.pdf).

20 Inputs provided by the Government of Meghalaya.

through sustainable forest management. The initiative focuses on watershed treatment, forest restoration, and participatory community involvement, with plans to establish plantations over 8,430 hectares and to treat and protect two key catchments—Umiew and Ganol. Advanced Geographic Information System (GIS) mapping has been utilised to capture more than 55,000 springs, to enable timely corrective actions. Over 500 community-based water-harvesting projects are also being established to improve climate-resilient water management for communities in the state. These initiatives not only aim to secure water resources but also empower communities to adapt to the changing climate effectively. Collectively, these measures strengthen water security while enhancing community resilience to climate change in the state.

**10.29 Odisha – Institutionalised Climate Adaptation through Water Governance<sup>21</sup>:** Central to this effort are over 39,000 Pani Panchayats, which empower communities to manage water resources while ensuring the inclusion of women and marginalised users. The Odisha Integrated Irrigation Project for Climate Resilient Agriculture enhanced 538 minor irrigation systems across 15 districts, benefiting around 125,000 households. By integrating modern irrigation techniques with sustainable agriculture and aquaculture practices, the project has achieved a 28.8 per cent increase in water productivity, a 67.8 per cent rise in agricultural output, a 105 per cent growth in high-value vegetable farming, and a 27 per cent boost in household incomes. These initiatives are transforming lives and building a sustainable future for communities in Odisha.

**10.30 Tamil Nadu’s Coastal Restoration Mission<sup>22</sup>:** Tamil Nadu has a 1,069 km coastline, home to 14 coastal districts that are vulnerable to impacts such as shoreline erosion, storm surges, and sea level rise. The Tamil Nadu Sustainably Harnessing Ocean Resources and Blue Economy Project employs a multi-pronged approach to enhance coastal biodiversity, improve coastal protection, enhance livelihoods, mitigate pollution, and enhance project management.

**10.31 Ahmedabad - Heat insurance to safeguard informal workers’ wages:** Ahmedabad became the first city in South Asia to launch a Heat Action Plan in 2013. Local grassroots organisations, such as the Mahila Housing Trust<sup>23</sup> and the Self-Employed Women’s Association,<sup>24</sup> have launched parametric heat insurance schemes to compensate women in the informal sector for wage losses on extremely hot days. The data-driven model uses real-time temperature monitoring to trigger automatic

21 Inputs provided by the Government of Odisha.

22 Inputs provided by the Government of Tamil Nadu.

23 The All India Disaster Mitigation Institute. (2025, May 14). Climate risk insurance: What worked! - The All India Disaster Mitigation Institute. Retrieved on December 23, 2025 from: <https://aidmi.org/blog/climate-risk-insurance-what-worked/in-inputs-provided-by-council-on-energy-environment-and-water-ceedw/>

24 Nanavaty, R., & Saxena, P. (2025, March 25). How heatwaves have sparked new ways for women farmers in India to protect their crops. World Economic Forum. Retrieved December 24, 2025, from <https://tinyurl.com/mwf3ehht> in inputs provided by Council On Energy, Environment and Water (CEEW).

payouts when the maximum temperature crosses certain predefined thresholds. The scheme charges an affordable annual premium of ₹354, and subscribers receive payouts ranging from ₹750 to ₹1,250.<sup>25</sup> By directly linking compensation to objectively measured weather conditions, the scheme provides a timely and predictable safety net for workers and recognises heat stress as an economic shock, rather than merely a public health concern.

**10.32 Uttarakhand - A community radio station is leading disaster preparedness:** Mandakini ki Aawaz, a community-run radio station in Sena Gadsari village, Rudraprayag, Uttarakhand, makes critical information and early warnings accessible to the community. By regularly corresponding with the India Meteorological Department, Dehradun, and the Uttarakhand State Disaster Management Authority, the radio station delivers early warnings, public service announcements, and disaster advisories that enhance preparedness before an extreme event, facilitate coordination during emergencies, and support recovery efforts.<sup>26</sup>

**10.33 Jodhpur - Community cooling stations are a model of community resilience:** Jodhpur Nagar Nigam North and Mahila Housing Trust, supported by the Natural Resources Defence Council, recently launched a net-zero cooling station as part of the city's Heat Action Plan<sup>27</sup> in key heat-vulnerable localities in the city. The stations combine passive cooling (wind towers, vetiver curtains, misting fans) with solar power and reflective roofing. They provide drinking water and first aid, offering refuge for outdoor workers and daily wage earners, who have limited access to air-conditioned spaces. By integrating passive cooling techniques, renewable energy, and traditional architectural elements, the facility serves as a model for scalable urban community cooling infrastructure. Early evidence suggests that the conditions inside the cooling centre are substantially cooler than those outdoors. In late April 2024, the temperature inside was about 8°C cooler during the hottest hours, from 12 PM to 6 PM.<sup>28</sup>

10.34 While these measures reflect a few examples of several such initiatives, climate resilience and adaptation can no longer be limited to managing forests, water bodies,

---

25 Dhruval Parekh, & Surangya Kaur. (2025, June 16). Beyond the thermometer: Ahmedabad uses cool roofs, misting bus stops & heat insurance for climate resilience. Down to Earth. Retrieved on December 23, 2025 from: <https://tinyurl.com/ypkfr2zh> in inputs provided by Council On Energy, Environment and Water (CEEW).

26 Khup Hangzo, PK (2023, October 19). Mandakini Ki Awaaz: Saving Lives, One Radio Broadcast at a Time. Vivekananda International Foundation, and Shawn Sebastian (2022, October 22). Mandakini Ki Awaz -How a community radio station is leading disaster preparedness in Uttarakhand in inputs provided by Council on Energy, Environment and Water (CEEW). Retrieved on December 22, 2025 from: <https://www.vifindia.org/print/12087> and <https://tinyurl.com/yrujvbu> respectively.

27 Jodhpur Heat Action Plan in inputs provided by Council on Energy, Environment and Water (CEEW). Retrieved on December 22, 2025 from: <https://tinyurl.com/msbsa8b7>.

28 Vijay Limaye (2024, June 7). Jodhpur, India Unveils a Net-Zero Public Cooling Station. Natural Resources Defense Council in inputs provided by Council on Energy, Environment and Water (CEEW). Retrieved on 22 December 2025 from: <https://tinyurl.com/mtzdye82>.

or coastlines alone; they must be built into the economic and business frameworks that sustain livelihoods and cities. Services such as decentralised renewable energy, solid waste management, and safe drinking water are emerging as resilience assets, strengthening local adaptive capacity while also advancing India's mitigation goals. The Climate Resilient Villages initiatives, such as those in Karnataka,<sup>29</sup> Tamil Nadu,<sup>30</sup> and Odisha<sup>31</sup> demonstrate how resilience can be institutionalised at the grassroots by transforming resilience from a project into a local governance function. As Indian cities continue to grow at a rapid pace, internalising climate risk into the fabric of urban planning, means considering how climate change affects land use, infrastructure, and the services provided to residents. By acknowledging these challenges, such as rising temperatures, flooding, and water shortages, we can better prepare our urban areas to address them. Building resilience is also vital for ensuring that the urban centres can thrive and continue driving economic growth.

### **Mitigation: Transition to a low-carbon economy**

10.35 India is adopting a multifaceted approach to mitigate global warming by diversifying its energy sources and enhancing access while also increasing the share of non-fossil fuels, improving energy efficiency, and promoting stability across its energy systems. These strategies align with the nation's development and sustainability objectives. A comprehensive range of policies has been implemented to achieve the 2030 Nationally Determined Contributions (NDC) targets.

10.36 The Economic Survey 2024–25 noted the potential of a rapid expansion of variable renewable energy sources without adequate firm baseload capacity and grid reinforcement leading to higher electricity prices, thereby compromising energy security. Experiences in the United Kingdom highlight how declining firm power source has contributed to higher system costs. Another case is Germany, which is experiencing rising household and industrial energy prices as a result of its energy transition policies.<sup>32</sup> As mentioned earlier, Spain and the Netherlands have recently faced growing grid instability and capacity limitations, reflecting the risks associated with transitions that outpace investments in baseload generation, transmission, and system flexibility. In the Netherlands, grid congestion has become severe enough to prompt public appeals to reduce electricity use during peak hours, while nearly 14,000 firms remain on waiting

29 Press Information Bureau. (2025, April 02). *Climate Resilient Coastal Fishermen Villages Programme*. Retrieved on December 24, 25 from: <https://tinyurl.com/mrxh8une>.

30 Kannan, V. and Chakraborty, A. (2025, April 02). *Sustaining Tomorrow: Locally Led Adaptation for a Changing Climate*. World Resource Institute India. Retrieved on December 20, 2025 from: <https://tinyurl.com/57dhkcxz>.

31 Inputs received from the Government of Odisha.

32 Bothe, D., Reichenbach, J., Bieniasch, M., Braendle, G., Coordt, L., Janssen, M., Kuttler, F., Lorenczik, S., Stoll, J., Begemann, U., Frewer, T., Branconi, C., Frontier Economics, & Melnikov, H. (2025). NEW PATHWAYS FOR THE ENERGY TRANSITION ('PLAN B'). In German Chamber of Commerce and Industry, Frontier Economics. Retrieved on January 12, 2026 from <https://tinyurl.com/c2hn3z3a>.

lists for new connections to the grid.<sup>33, 34</sup> These cases underscore the importance of grounding energy transitions in baseload adequacy and system reliability to ensure secure and affordable power.

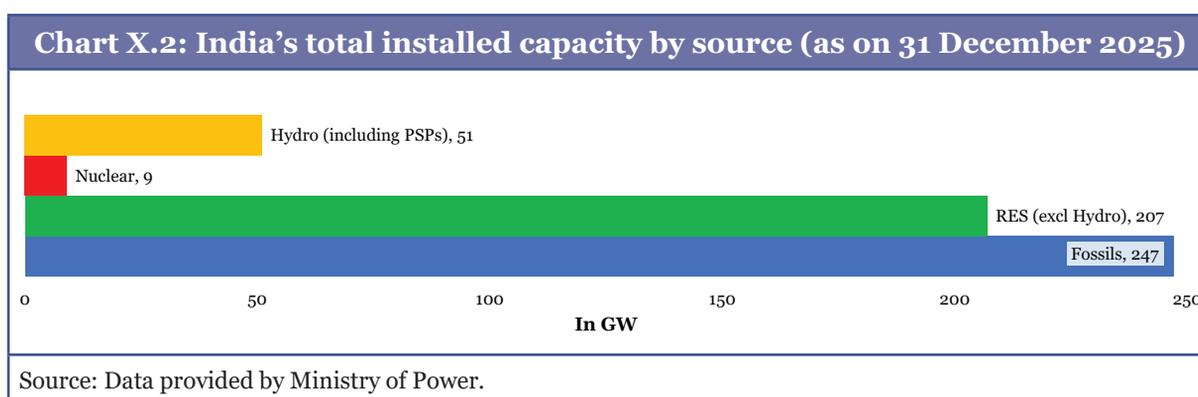
### Energy Transformation at Scale: India's Renewable Imperative

10.37 India's energy transition is being pursued through a combination of initiatives across various sectors, including nuclear, solar, and wind energy, green hydrogen, battery storage, and critical minerals, which help address both energy security and transition imperatives simultaneously. Details of some of these initiatives are presented in this section.

#### Recent measures to boost non-fossil fuel sources of energy

10.38 The country has already surpassed the goal of 50 per cent installed power capacity from non-fossil fuel sources (stood at 51.93 per cent at the end of December 2025<sup>35</sup>), supported by record annual additions of renewable energy capacity (Chart X.2). During 2025-26 (up to 31st December 2025), a total of 38.61 GW of renewable energy capacity has been installed in the country, which includes 30.16 GW of solar power, 4.47 GW of wind power, 0.03 GW of Bio-Power and 3.24 GW of hydro power.<sup>36</sup>

10.39 According to the International Renewable Energy Agency (IRENA)'s Renewable Energy Statistics 2025,<sup>37</sup> India now ranks fourth globally in total installed renewable energy capacity (after China, the USA, and Brazil), which underscores India's growing influence in global clean energy markets.



33 Pascoe, R. (2025, October 6). 14,000 companies wait for a new Dutch power grid connection. DutchNews.nl. Retrieved on December 20, 2025, from: <https://tinyurl.com/2m7h4n6s>.

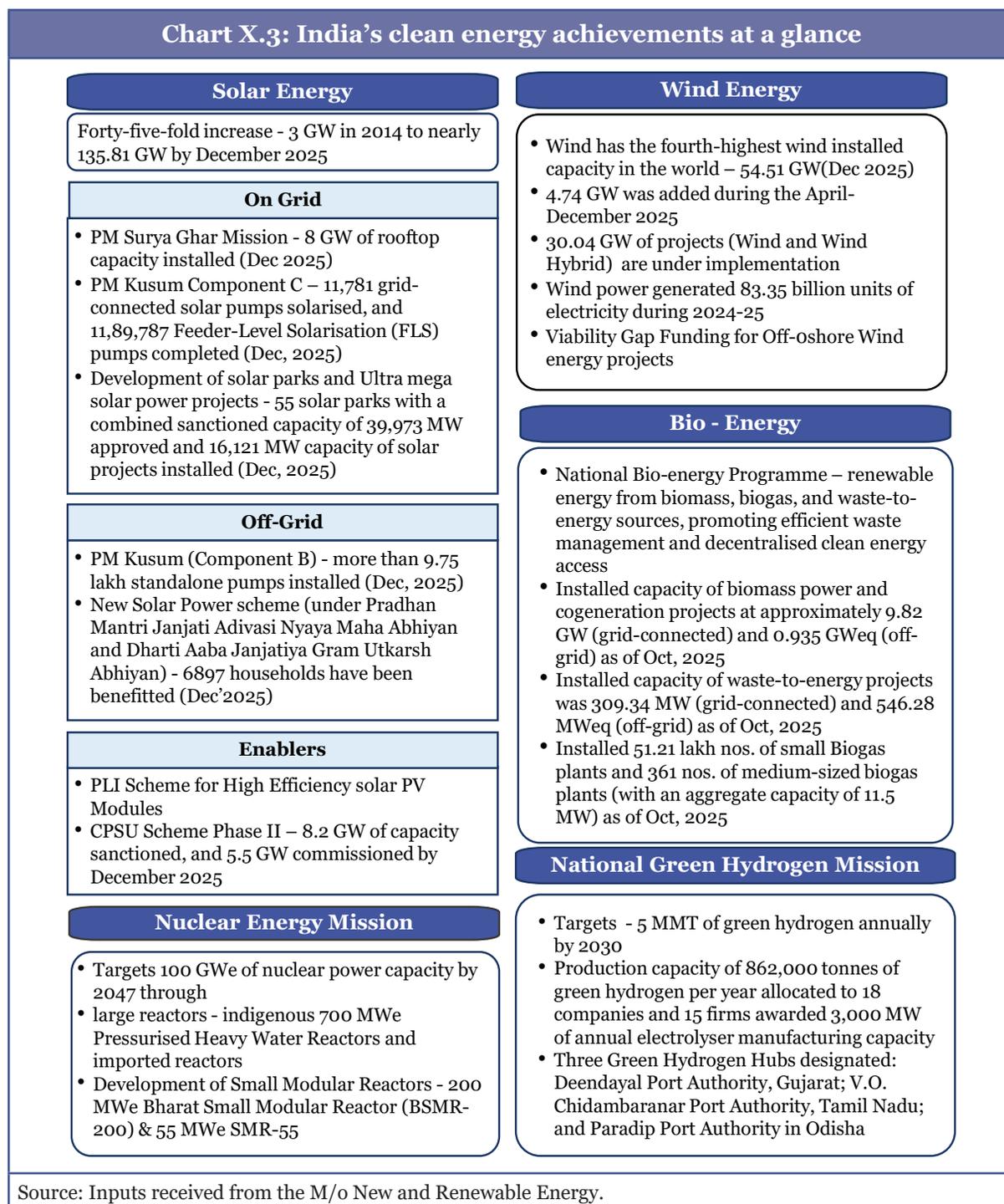
34 Laurenson, J. (2025, October 16). Netherlands' renewables drive putting pressure on its power grid. Bloomberg. Retrieved on December 20, 2025 from: <https://www.bbc.com/news/articles/cn40y9yxkgvo>.

35 Data provided by Ministry of Power.

36 Inputs provided by Ministry of New and Renewable Energy.

37 IRENA Renewable Energy Statistics 2025. (2025, March 1). Retrieved on December 22, 2025 from: <https://tinyurl.com/55mybytc>.

10.40 The progress in expanding non-fossil fuel-based power capacity has been supported by a wide variety of initiatives to boost renewable energy systems, including solar, wind, and bio-energy. Additionally, new measures are being taken to support other clean sources of energy, including the National Nuclear Mission, the Green Hydrogen Mission, and the Bio Energy Programme.<sup>38</sup> A snapshot of India’s key clean energy initiatives and achievements is shown in Chart X.3.



<sup>38</sup> Inputs received from the M/o New and Renewable Energy.

### Box X.2: The Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Act, 2025

Nuclear is one of the cleanest forms of energy, capable of overcoming the concerns of intermittency and energy security associated with other renewable sources of energy like solar and wind power. Besides, nuclear energy can provide a reliable energy source for heavy industries that find it difficult to use renewable sources due to technological challenges. It can be used to produce hydrogen to power vehicles, and industrial process.<sup>39</sup> The Government of India had announced the Nuclear Energy Mission in the Union Budget 2025-26 and allocated ₹20,000 crore with the aim of developing at least five indigenously designed and operational small modular reactors (SMRs) by 2033.<sup>40</sup>

India currently has a total nuclear capacity of 8,780 megawatt (MW).<sup>41</sup> The Central Electricity Authority has also estimated that the capacity mix of the power system in 2047 would have 100 GW of nuclear power capacity.<sup>42</sup>

Therefore, as a major step forward in this direction, India has adopted the landmark Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Act in December 2025. The SHANTI Act consolidates and modifies India's nuclear legal framework<sup>43</sup>- the Atomic Energy Act, 1962, and the Civil Liability for Nuclear Damage Act, (CLNDA) 2010 to enable participation of the private sector or state governments, previously not allowed under the Atomic Energy Act, 1962 and also addresses liability structure under the CLNDA<sup>44</sup> by establishing a graded liability framework, but without diluting victim compensation.<sup>45</sup> The new framework enables private sector participation in key activities, including plant operations, power generation, equipment manufacturing and carrying out research and innovations in the field of peaceful uses of atomic energy.

10.41 Despite the progress in expanding non-fossil fuel energy, challenges remain. The renewable energy systems of solar and wind are highly material-intensive and require capital-intensive energy storage technologies for integrating renewable energy

39 Central Electricity Authority. (2025, June). Road map for achieving the goal of 100 GW of nuclear capacity by 2047 (Final Report). Ministry of Power, Government of India. Retrieved December 28, 2025, from <https://tinyurl.com/yuzryce7>.

40 Government of India, Ministry of Finance, Central Budget Division. (2025). Budget 2025-26 speech. <https://tinyurl.com/528s7wjs>.

41 Ministry of Power. (2025, November). Power Sector at a Glance: All India. Government of India. Retrieved December 28, 2025, from <https://tinyurl.com/4hkz29cs>.

42 Central Electricity Authority. (2025, June). Road map for achieving the goal of 100 GW of nuclear capacity by 2047 (Final Report). Ministry of Power, Government of India. Retrieved December 28, 2025, from <https://tinyurl.com/yuzryce7>.

43 Press Information Bureau. (2025, December 19). The Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Bill, 2025 (Explainer ID 156593). Government of India. Retrieved December 28, 2025, from <https://tinyurl.com/3h7r9fa8>.

44 Press Information Bureau. (2025, December 17). Dr. Jitendra Singh says SHANTI Bill retains strong safety and liability safeguards amid Lok Sabha debate [Press release]. Government of India. Retrieved December 28, 2025, from <https://tinyurl.com/2pcdf7vv>.

45 Press Information Bureau. (2025, December 18). Rajya Sabha passes SHANTI Bill 2025, after it was passed by Lok Sabha [Press release]. Government of India. Retrieved December 28, 2025, from <https://tinyurl.com/2tyvukx8>.

into the energy grid. Material and storage requirements represent the two roadblocks to greater utilisation of these energy sources. The former extends beyond the access to critical minerals and is likely to have implications for the requirements of mining and energy for material processing (Box X.4). With respect to energy technology, the challenge is not just the need for new technologies, but also the substantial investment requirements. The unit cost of storage capacity installed is determined by the number of times each MW of storage is used in a year, which is likely to be less for short-term storage capacities than long-term capacities.<sup>46</sup> The following subsections delve into these two challenges.

## The Case for Battery Storage

10.42 The Central Electricity Authority (CEA) estimated that India will require around 336 gigawatt-hours (GWh) of energy storage capacity by 2029–30 and 411 GWh by 2031–32 to support the reliable integration of renewable energy sources.<sup>47</sup> To enable this scale-up, a coordinated set of policy, regulatory, demand-side, and supply-side measures is being implemented.

10.43 Energy storage systems are formally recognised under the Electricity Rules as an integral part of the power system<sup>48</sup> and are included in the Harmonised Master List of Infrastructure<sup>49</sup> improving access to long-tenure, lower-cost finance. Storage has been embedded in the Resource Adequacy Planning Guidelines<sup>50</sup> and supported through a National Framework for the Promotion of Energy Storage Systems.<sup>51</sup>

10.44 Market and regulatory measures have been introduced to expand revenue streams for storage, including the waiver of inter-state transmission charges for co-located battery storage energy system (BESS) and pumped storage projects until June 2028,<sup>52</sup> eligibility of storage for ancillary services,<sup>53</sup> participation in the High-Price Day-Ahead

46 Upadhyaya, Y., & Agrawal, M. (2025, March 29). Long term electricity storage is wishful thinking. Medium. Retrieved December 26, 2025, from <https://tinyurl.com/4nn7m5z7>.

47 Ministry of New and Renewable Energy. Energy Storage Systems (ESS) Overview. Retrieved on December 24, 2025, from: <https://tinyurl.com/3enfzyyn>.

48 The Energy Conservation (Amendment) Act, 2022. Retrieved on January 20, 2026 from <https://tinyurl.com/37t99jwd>.

49 Infrastructure In India Initiative by Infrastructure Finance Secretariat, Department of Economic Affairs, Ministry of Finance. Retrieved on December 24, 2025, from: [https://infrastructureinindia.gov.in/harmonized\\_list](https://infrastructureinindia.gov.in/harmonized_list).

50 Ministry of Power (2023, June 28). Guidelines for Resource Adequacy Planning Framework for India-reg. Retrieved on December 24, 2025, from: <https://tinyurl.com/339u8uya>.

51 Ministry of New and Renewable Energy. National Framework for Promoting Energy Storage Systems by Ministry of Power. Retrieved on December 24, 2025, from: <https://tinyurl.com/3rsdnvma>.

52 Ministry of New and Renewable Energy. Waiver of Inter-State Transmission Charges for Energy Storage Systems (ESS). Retrieved on December 24, 2025, from: <https://tinyurl.com/3jw29mrn>.

53 Central Electricity Regulatory Commission. Central Electricity Regulatory Commission (Ancillary Services) Regulations, 2022. Retrieved on January 20, 2026 from <https://tinyurl.com/3tunwwud>.

Market,<sup>54</sup> and tariff-based competitive bidding guidelines for BESS procurement.<sup>55</sup> To accelerate deployment, the Government has launched two Viability Gap Funding (VGF) schemes supporting approximately 43 GWh of BESS (March 2024 and June 2025).<sup>56</sup> Further, manufacturing is supported through a ₹18,100 crore Production-Linked Incentive (PLI) scheme for 50 GWh of Advanced Chemistry Cell capacity, in which 10 GWh is earmarked for grid-scale storage.<sup>57</sup> For pumped storage projects, a grant-based support is provided to enable infrastructure.<sup>58</sup> Regulatory clearances have been streamlined for closed-loop projects, and ownership of storage has been liberalised to include consumers. Additional measures include advisory norms for co-locating storage of at least 10 per cent of installed solar capacity<sup>59</sup> to improve the dispatchability of solar power.

10.45 Recently, the International Finance Corporation (IFC)<sup>60</sup> committed USD 51.4 million (₹460 crore) in FY26 to IndiGrid Infrastructure Trust, an AAA-rated transmission infrastructure investment trust regulated by SEBI, to support the deployment of a 180MW/360Mwh utility-scale standalone BESS in Gujarat. The project is the largest standalone BESS in India, setting a scale and technology standard for future deployments. To de-risk this first-of-a-kind project and effectively reduce upfront costs, the commitment was strategically structured to include concessional support from the Clean Technology Fund (CTF), a multi-donor trust fund.

### Box X.3: Renewable energy integration in the State of Kerala

Given the intermittent nature of solar energy, an effective way to utilise it would be to consume the electricity generated during the day and store the excess or export it to the grid. Batteries are still expensive; therefore, exporting to the grid remains a practical option, where a distribution company (discom) or power utility serves as the backup. To enable effective integration with the grid the Kerala State Electricity Board (KSEB)<sup>61</sup> now requires new connected households,

54 Press Information Bureau. (2025, December 18). Development and Deployment of Energy Storage Capacities to Power Reliable Renewable Future. Retrieved on December 24, 2025, from: <https://tinyurl.com/ypkzbz4z>.

55 Ministry of Power. Guidelines for Procurement and Utilization of Battery Energy Storage Systems as of Generation, Transmission and Distribution assets, along with Ancillary Services. Retrieved on January 20, 2026 from <https://tinyurl.com/55f8x3cj>.

56 Press Information Bureau. (2025, December 18). Development and Deployment of Energy Storage Capacities to Power Reliable Renewable Future. Retrieved on December 24, 2025, from: <https://tinyurl.com/ypkzbz4z>.

57 Press Information Bureau. (2025, December 18). Development and Deployment of Energy Storage Capacities to Power Reliable Renewable Future. Retrieved on December 24, 2025, from: <https://tinyurl.com/ypkzbz4z>.

58 Ministry of Power. (2024, September 30). Modification of the scheme of Budgetary Support for the cost of Enabling Infrastructure for Hydro Electric Projects. Retrieved on December 24, 2025, from: <https://tinyurl.com/jc9pme2m>.

59 Central Electricity Authority (2025, February 18). Advisory on co-locating Energy Storage Systems with Solar Power Projects to enhance grid stability and cost efficiency reg. Retrieved on December 24, 2025, from: <https://tinyurl.com/374xw9dv>.

60 Inputs provided by International Finance Corporation.

61 Kerala State Electricity Regulatory Commission. (2025, November 05). Kerala State Electricity Regulatory Commission (Renewable Energy and Related Matters) Regulations, 2025. Retrieved on December 24, 2025, from: <https://tinyurl.com/2tz3bkfk>.

as well as industrial and agricultural solar plants, to install battery storage capacities. For example, Rooftop solar systems above 10 kilowatt(kW) would need to have 10 per cent battery storage, and those between 15 and 20 kW would require 20 per cent. After 2027, even smaller 5 kW systems would require storage. Battery capacities in solar plants are expected to address the issue of intermittency of solar power. Another incentive to increase the uptake of battery storage alongside solar power is also being provided through a gross metering mechanism, which offers higher tariffs to customers who have battery storage.

## Critical Minerals and the Political Economy of the Energy Transition- Balancing Resilience, Standards, and Inclusiveness

10.46 The global energy transition is no longer solely determined by technology; it is increasingly constrained by who controls critical minerals. Metals like Lithium, cobalt, nickel, copper, and rare earth elements have become the new strategic chokepoints in shaping the contours of a low-carbon economy, influencing energy security, industrial competitiveness, and geopolitical power, as observed through several trade restrictions on export of critical minerals by source countries.<sup>62</sup> Copper, in particular, is becoming a highly price-volatile metal<sup>63</sup> due to a number of factors. These include a series of mine outages<sup>64</sup> in Indonesia, Congo, and Chile<sup>65</sup> rising concerns of a supply deficit in medium to long terms, given perpetually growing demand from the power sector and data centres across the world, and trade protectionist measures.<sup>66</sup>

### Box X.4: Material requirements for Renewable Energy

The numbers below give a sense of the amount of investment that India may be required to make in renewable energy generation and the tremendous amount of energy they need in the first place:

Solar panels with a power capacity of 1 GW require approximately 18.5 tons of silver, 2,000-3,000 tons of polysilicon, and 10,252 tons of aluminium. To make the 1 GW, 18.5 tons of silver:  $18.5 \times 250 \text{ MWh} = 4,625 \text{ MWh}$  is roughly the equivalent of the yearly electricity consumption of 350-400 US households. Producing the aluminium requires  $10,252 \text{ tons} \times 190 \text{ gigajoules per ton (GJ/ton)} = \sim 1,948,000 \text{ GJ}$ , equivalent to the yearly electricity consumption of over 100,000 average households.

62 UN Trade and Development. (2025). Trade in critical minerals shapes energy transition, digital transformation and industrial development worldwide [UNCTAD SDG Pulse 2025 – In Focus]. Retrieved December 28, 2025, from <https://sdgpulse.unctad.org/critical-minerals/>.

63 Burton, M., & Attwood, J. (2025, December 23). Copper hits \$12,000 for first time as tariff trade upends market. Bloomberg News. Retrieved December 28, 2025, from <https://tinyurl.com/4jfsku9z>.

64 Mining outages are cessation of mining operations. Recently, Congo experienced fatal mining outages.

65 Bloomberg. (2025, December 24). Copper set for best year since 2009 after December surge. Bloomberg News. Retrieved December 28, 2025, from <https://tinyurl.com/yswks2dk>.

66 Attwood, J. (2025, December 10). Copper price record: How supply crunch is looming just as AI boom hits. Bloomberg News. Retrieved December 28, 2025, from <https://tinyurl.com/568jwetm>.

The world will also soon run short of copper at the current rate of rising power demand, in part due to the proliferation of AI data centres. A single example illustrates the investment and operational costs involved. It would take 1,194 truckloads to provide the 2,866 tons of copper needed for a 1 GW wind turbine—that's just for the copper.

To produce 2,866 tons of copper from ore with a 0.6 per cent yield, miners must process about 167–200 tons of ore per ton of copper. Current estimates (2020s) place the average for operating mines at approximately 0.5–0.6 per cent with many large mines below 0.6 per cent and new projects even lower (around 0.4–0.5 per cent). The formula is: Total material required (tons) = Copper produced (tons) ÷ Yield (decimal). Total material = 2,866 ÷ 0.006 = 477,666.67 tons. Divided by 400-ton trucks, this equals 1,194 truckloads.

This already assumes only the copper-bearing ore, no waste rock, no overburden,<sup>67</sup> no rejected material, no processing losses. In real mines, the total material moved is typically 2–4 times higher once waste rock stripping is factored in. If fully accounted for, total material moved per GW of wind power would likely exceed 1–2 million tons, not 0.48 million.

Source: Industry Sources and Own Calculations.

10.47 As demand accelerates, advanced economies are responding by promoting standards-based critical mineral markets, emphasising sustainability, traceability, and governance. Initiatives such as the G7 Roadmap to Promote Standards-Based Markets for Critical Minerals<sup>68</sup> aim to enhance transparency, reduce concentration risks, and encourage responsible sourcing. However, implementing digital traceability systems, meeting certification requirements, and enhancing environment, social and governance (ESG) compliance can entail substantial costs. While these objectives are legitimate, standards are not neutral technical tools. They are instruments of market power. Their design will determine who can enter supply chains, who captures value, and who bears transition costs.

10.48 From the perspective of developing countries, the current direction presents three significant challenges. Firstly, there's a risk that standards could turn into barriers instead of facilitating progress. With the introduction of digital traceability systems, certification requirements, and ESG compliance, the upfront costs and ongoing expenses can be quite steep. For many resource-rich developing nations, these financial burdens may lead to investor pessimism, and slow down project development, and limit supply. This is especially concerning as the world urgently needs these countries to ramp up their efforts in response to global transitions.

10.49 Second, there is a real concern that standards wherein if narrowly defined or asymmetrically enforced, can trap developing countries in the lowest-value segments

67 Overburden in copper mining is the waste rock and soil removed to access the ore.

68 G7 Canada (2025, November 01). Roadmap to promote standards-based markets for Critical Minerals. Retrieved on December 22, 2025 from: <https://tinyurl.com/3xxkck6u>.

of supply chains, exporting raw materials while concentrating value-added processing and manufacturing in advanced economies.

10.50 Third, affordability is adversely impacted. Sustainability premiums that tend to raise mineral prices without parallel support for finance, technology, and capacity-building will increase costs to transitioning globally and disproportionately impact emerging economies. A transition that is clean but unaffordable is neither rapid nor just. A durable global framework for critical minerals must therefore move beyond compliance-centric thinking. It must be inclusive, capacity-sensitive, and development-oriented. Resource-rich regions in Africa, Latin America, and Asia must be treated as co-producers of value, rather than merely sources of raw materials. This requires careful deliberation on aspects of international cooperation on technology transfer, skills, institutions, and investment in mining, processing, and recycling.

10.51 India's strategy reflects this balance with a focus on domestic capabilities through the National Critical Mineral Mission along with suitable incentive mechanism, while engaging in international partnerships like the Minerals Security Partnership<sup>69</sup> and the Indo-Pacific Economic Framework.<sup>70</sup> India consistently demonstrates that there is a complementarity between strategic autonomy and global integration.

10.52 The Government of India has launched the National Critical Mineral Mission (NCMM)<sup>71</sup> as a strategic initiative to secure the supply chain of minerals essential for renewable energy and storage technologies. The major objectives of the Mission are to secure domestic and foreign sourcing of critical minerals and strengthen value chains.

10.53 Amendments to the Mines and Minerals (Development and Regulation) Act 2023<sup>72</sup> have broadened the central government authority to auction 24 of 30 identified critical minerals and opened exploration and mining of six previously restricted minerals to private sector participation. Further, the MMDR Act was amended with effect from 01.09.2025. Through the said amendment, provision has been made in the Act for inclusion of any new mineral in a mining lease. This will boost mining of critical minerals in the country.

10.54 The Geological Survey of India has completed 195 exploration projects in FY 24-25 and taken up 230 exploration projects in FY 2025-26 for critical and strategic

69 Press Information Bureau (2023, August 07). Strengthening of Mineral Supply Chains. Retrieved on December 22, 2025 from: <https://tinyurl.com/b35vdmhh>.

70 Press Information Bureau (2024, September 22). India signs first-of-its-kind agreements focused on Clean Economy, Fair Economy, and the IPEF Overarching arrangement under Indo-Pacific Economic Framework for prosperity. Retrieved on December 22, 2025 from: <https://tinyurl.com/3btmf3b4>.

71 Press Information Bureau (2025, September 06). India's Critical Mineral Mission: Securing the Minerals of Tomorrow. Retrieved on December 23, 2025 from: <https://tinyurl.com/mwpraj8t>.

72 Press Information Bureau (2023 December 06). Launching of Critical Mineral Blocks Auction. Retrieved on December 24, 2025 from: <https://tinyurl.com/ppf88rp2>.

minerals across the country.<sup>73</sup> Meanwhile, the government's joint venture, Khanij Bidesh India Ltd. (KABIL), has acquired 15,703 hectares in Argentina for lithium mining, alongside partnerships in Australia and Chile.

10.55 To further enhance the resilience of our supply chains, the Union Cabinet has approved the setting up of the National Critical Mineral Mission (NCMM) on 29 January 2025 with a financial outlay of ₹16,300 crore and expected investment of 18,000 crore from PSUs and others. The Mission aims to secure a long-term sustainable supply of critical minerals and strengthen India's critical mineral value chains encompassing all stages from mineral exploration and mining to beneficiation, processing, and recovery from end-of-life products.

10.56 To build supply chain resilience in critical minerals, the Union Cabinet has approved a ₹1,500 crore Incentive Scheme for Promotion of Critical Mineral Recycling under NCMM. The scheme will incentivise that part of the recycling value chain in which actual extraction of critical minerals takes place, and will develop recycling capacity for critical materials in the country for the separation and production of critical minerals from secondary sources.

### **Carbon Credit Trading Scheme: from framework to implementation**

10.57 India has made substantial progress in establishing its carbon market framework, a crucial step towards developing its mitigation strategy. The government adopted the Carbon Credit Trading Scheme (CCTS) in June 2023, operating through a dual mechanism that incorporates mandatory compliance and voluntary offset approaches.<sup>74</sup> The compliance mechanism targets energy-intensive industrial sectors through an emission intensity-based baseline-and-credit system, initially covering sectors such as cement, iron and steel etc.<sup>75</sup> Entities that exceed their emissions intensity targets earn Carbon Credit Certificates (CCCs), denominated in tonnes of CO<sub>2</sub> equivalent (tCO<sub>2</sub>e), which they can trade on power exchanges. Those that fall short must buy and surrender equivalent credits. This framework leverages the existing Perform, Achieve and Trade (PAT) scheme infrastructure, gradually transitioning it into a fully operational compliance carbon market. In 2025, the government notified pro-rata Greenhouse Gas Emission Intensity (GEI) targets for four sectors: Aluminium, Cement, Chlor-Alkali, and Pulp and Paper.

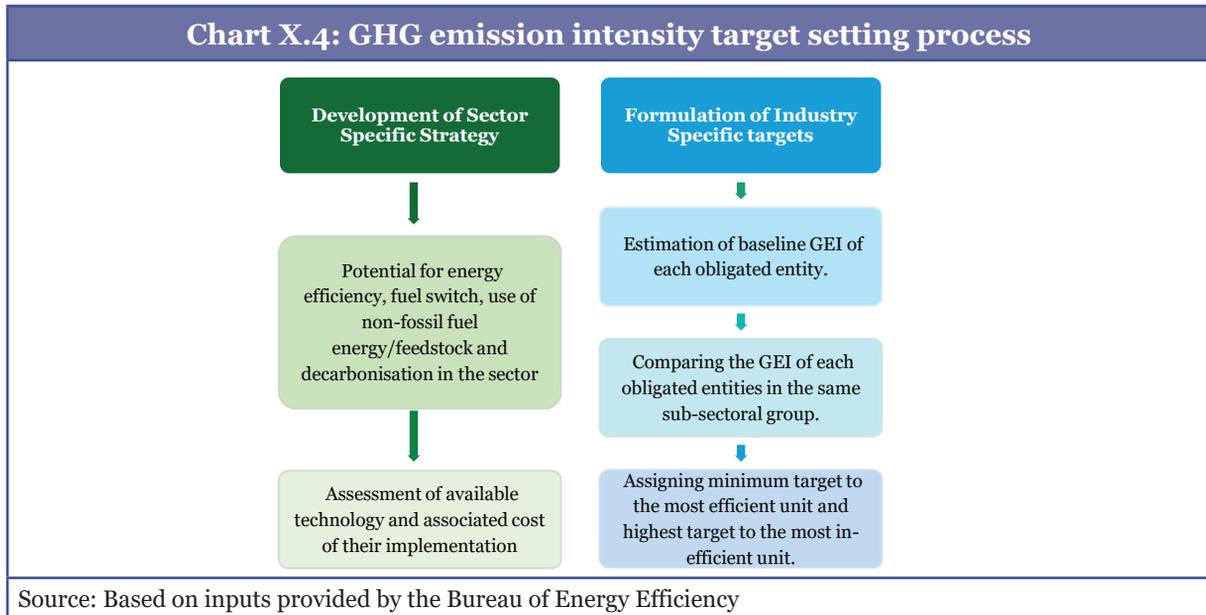
10.58 Under the Offset Mechanism, Non-Obligated Entities may voluntarily register projects that reduce, remove, or avoid greenhouse gas emissions to earn CCCs. This

<sup>73</sup> Press Information Bureau (2024, January 15). Mineral Exploration Under Nmep. Retrieved on December 24, 2025 from: <https://tinyurl.com/3amkkes9>.

<sup>74</sup> Press Information Bureau (2025, December 04). Framework for Carbon Credit Trading Scheme (CCTS). Retrieved on December 10, 2025 from: <https://tinyurl.com/329s5enu>.

<sup>75</sup> Information Retrieved on 12 December 2025 from <https://beeindia.gov.in/carbon-market.php>.

mechanism enables mitigation outcomes from entities outside the compliance framework and incentivises climate action in these areas. In this context, the government has approved a list of 10 sectors - energy, industries, agriculture, waste handling and disposal, forestry, transport, fugitive emissions, construction, solvent use, and Carbon Capture, Utilisation, & Storage (CCUS) and others - for the offset mechanism.



**Box X.5: Developments in the International Carbon Markets**

Several major economies have operationalised emissions trading systems (ETS) as market-based instruments to reduce greenhouse gas emissions, offering useful lessons for countries designing or scaling domestic carbon markets. The European Union Emissions Trading System, the Korea Emissions Trading Scheme, and the China National ETS represent three of the world’s major emissions trading systems, reflecting different design choices and stages of market maturity.

The EU ETS, launched in 2005, is a cap-and-trade, compliance-based system with an absolute emissions cap that is progressively tightened over time. Evidence suggests that in the initial stages of the EU ETS, oversupply of offset credits led to dilution of emission prices. The ETS, now in its fourth phase, is highly complex, encompassing power, industry, domestic aviation, and maritime sectors in its current form. In general, the allowances accounting for up to 57 per cent of the emission cap are to be auctioned, and the rest are allocated freely to avoid “carbon leakage”<sup>76</sup> in susceptible sectors, such as steel, cement, aluminium, fertilisers, hydrogen, and iron and steel. The Carbon Border Adjustment Mechanism (CBAM) will gradually replace free allocation in such sectors from 2026 onwards.

The EU has further introduced a new emissions trading system (ETS2) to cover CO2 emissions from fuel combustion in buildings, road transport, and additional sectors (mainly

<sup>76</sup> EU states that ‘Carbon leakage could occur if ETS-regulated activities were moved to non-EU countries with less ambitious climate policies, leading to an increase in overall greenhouse gas emissions.’ in European Union (2025, December 03). Retrieved on December 23, 2025 from: <https://tinyurl.com/mp5rb37d>.

small industries not covered by the existing EU ETS) (to be implemented by 2027).<sup>77</sup> The use of offset credits, initially allowed, has now been discontinued in Phase Four.

Korea's ETS,<sup>78</sup> operational since 2015, follows a similar cap-and-trade approach but places greater emphasis on calibrated free allocation and limits the use of offsets to manage competitiveness concerns. Korean ETS covers the maritime, waste, domestic aviation, transport, buildings, industry, and power sectors, with free allocations of allowances based on a benchmark system, which allows entities to use offsets up to 5 per cent of their verified emissions.

China's national ETS,<sup>79</sup> implemented in 2017, covers the power, steel, cement, and aluminium smelter sectors, with annual emissions exceeding 26,000 tCO<sub>2</sub>, and is an intensity-based system. The allowances in the Chinese ETS are 100 per cent freely allocated using an output-based (or-benchmark)<sup>80</sup> approach, while also allowing entities to use offsets up to five per cent of their verified emissions.

A few lessons from these experiences in the context of the carbon markets framework are (a) a gradual approach to inclusion of sectors, (b) avoiding generous free allowances or allowing offsets to meet the targets and (c) ensuring alignment with country contexts.

## Mission LiFE

10.59 The Mission LiFE - Lifestyle for Environment, an initiative introduced in 2021, at COP26 in Glasgow, connects individual and community behaviour change with efforts to deal with climate change. In fact, LiFE is an integral part of India's NDC.

10.60 By driving core shifts in consumption and production patterns towards sustainability, embedding circularity, and enabling adaptation to the impacts of climate change, the Mission's functions highlight that small, collective actions can cumulatively advance the country's climate goals.

10.61 Majority of India's climate-oriented schemes are fundamentally aligned with the ethos of Mission LiFE, as they combine government interventions with behavioural and lifestyle shifts at the household, community and enterprise levels. In energy efficiency, programmes such as appliance Standards and Labelling, mass LED adoption (Unnat Jyoti by Affordable LEDs for All -UJALA), and industrial efficiency

<sup>77</sup> European Union. Retrieved on December 23, 2025 from: <https://tinyurl.com/3jx8jkpx>.

<sup>78</sup> International Carbon Action Partnership. Korea Emissions Trading System (K-ETS). Retrieved on December 23, 2025 from <https://tinyurl.com/4akssbd8>.

<sup>79</sup> International Carbon Action Partnership. China National ETS. Retrieved on December 23, 2025 from <https://icapcarbonaction.com/en/ets/china-national-ets>.

<sup>80</sup> 'The sectoral balance value represents the carbon emissions intensity level at which the total number of allowances allocated would equal total verified emissions' in International Carbon Action Partnership (2025, December 01). China releases 2024-2025 allowance allocation plan for industrial sectors in National ETS. Retrieved on December 23, 2025 from <https://tinyurl.com/5buz49xd>.

mechanisms (PAT) encourage the use of less energy for the same service, embedding mindful consumption rather than only supply-side control on emissions. The NAPCC provides the overarching framework for India’s climate response, with its missions on energy efficiency, sustainable habitats, water, and agriculture explicitly promoting conservation, resource efficiency, and community participation, which are also the core principles of Mission LiFE.

10.62 Together, these examples demonstrate that India’s climate strategy is not confined to emissions targets or technologies alone, but is deliberately designed to reshape consumption patterns, social norms and daily choices, making Mission LiFE not a parallel initiative but the behavioural foundation underlying most climate policies in the country.

#### Box X.6: Transforming Waste into Wealth by Odisha<sup>81</sup>

Odisha launched a state-wide mission to tackle solid waste in 2023, called the “Garbage-Free Urban Odisha”. The mission combines advanced bio-mining technologies, strong institutional planning, and community participation through self-help groups to tackle legacy waste and transform reclaimed dumpsites into new wealth centres, thereby securing against further dumping. The Bhubaneswar Municipal Corporation has rolled out initiatives such as a coconut waste processing facility, a flower waste facility, a 150-tonnes per day (TPD) mega material recovery facility, and a 10-TPD plasma processor to convert waste into value-added products, creating livelihoods, and fostering innovation in urban waste management.

## Climate Finance

10.63 The current levels of climate finance fall short of the requirements of developing countries to meet their climate ambitions. By 2030, developing economies are estimated to need USD 5–6 trillion<sup>82</sup> for climate action. The Fourth International Conference on Financing for Development, titled *Compromiso de Sevilla*<sup>83</sup> recognised that, despite sustained global efforts, the gap between sustainable development ambitions and available financing has continued to widen—particularly for developing countries—reaching an estimated USD 4 trillion annually. This gap does not arise from a lack of global capital, but rather from the disparity between where capital is concentrated and where investment needs for sustainable development are most pressing.

81 Inputs provided by Government of Odisha.

82 UNFCCC (2024, September 10). Second report on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement. Retrieved on December 23, 2025 from: <https://unfccc.int/documents/640757>.

83 UNDESA. Sevilla Commitment Fourth International Conference on Financing for Development. Retrieved on December 23, 2025 from: <https://tinyurl.com/mrxk22e9>.

10.64 Global financial assets under management reached USD 147 trillion in 2025,<sup>84</sup> yet climate finance flows remain highly skewed. In 2023, global climate finance totalled USD 1.9 trillion, of which private capital accounted for nearly USD 1.3 trillion. More than half of this private finance flowed to advanced economies, with China attracting another 30 per cent, while developing countries, excluding China, received only about 15 per cent.<sup>85</sup> International public finance to developing economies remains limited, and domestic actors continue to dominate global climate finance, accounting for nearly 80 per cent of total flows.

10.65 These patterns embedded in the international financial architecture reflect a persistent and clear bias in favour of developed countries. Capital tends to flow to the economies with deeper financial markets, stable macroeconomic conditions, and those that are generally perceived as having lower risks. Developing countries, however, face higher borrowing costs because of currency volatility, lower sovereign credit ratings, and financial systems that lack depth. As a result, despite the abundant global capital, investors often hesitate to finance climate resilience projects in developing countries, even when these nations are more vulnerable to climate change impacts and such investments could yield significant benefits. Investors, do not internalise the social benefit of their investments in developing countries [Box III.3: Microfinance, financialisation, and the need to re-centre household welfare in impact investing]. This imbalance not only hampers growth and development in these countries but also undermines global efforts to address the escalating climate crisis.

10.66 India faces global challenges in climate finance. Although the country has successfully reduced its emissions intensity by 36 per cent since 2005 and achieved 50 per cent non-fossil power capacity ahead of schedule,<sup>86</sup> climate finance remains skewed towards mature sectors such as solar, wind energy and energy efficiency. Critical areas, including adaptation, financing for micro, small, and medium enterprises (MSMEs), urban infrastructure, and hard-to-abate industries, remain underfunded. Currently, around 83 per cent of India's finance for mitigation and 98 per cent of finance for adaptation is sourced domestically.<sup>87</sup> However, the gaps in available finance and the needs persist,<sup>88</sup> relying solely on domestic resources will not be sufficient.

---

84 Torbey, H., Kwek, J.-H., Banani, F., & Nguyen, V. (2025, September 18). Asset management 2025: The great convergence. McKinsey. Retrieved December 24, 2025, from: <https://tinyurl.com/372k2338>.

85 Climate Policy Initiative. 2025. Global Landscape of Climate Finance 2025. Retrieved December 24, 2025, from <https://tinyurl.com/bde426bf>.

86 Press Information Bureau. (2025, December 08). Parliament Question: Reduction In Carbon Dioxide Emission. Retrieved on December 23, 2025 from: <https://tinyurl.com/vhtmkfv>.

87 Climate Policy Initiative. 2024. Landscape of Green Finance in India 2024. Retrieved December 24, 2025, from <https://www.climatepolicyinitiative.org/publication/landscape-of-green-finance-in-india-2024/>

88 Climate Policy Initiative. 2024. Landscape of Green Finance in India 2024. Retrieved December 24, 2025, from <https://www.climatepolicyinitiative.org/publication/landscape-of-green-finance-in-india-2024/>.

10.67 International public sector climate finance at an affordable cost, is therefore essential for mobilising private sector finance, required to meet climate ambitions.

### Bridging the Finance Gap in the Indian Context

10.68 India has taken several steps to mobilise climate finance. Sovereign green bonds have been issued to fund low-carbon public infrastructure, providing policy signalling and market benchmarks. The broader ecosystem has also been strengthened. 100 per cent FDI has been permitted under the automatic route for renewable energy projects.<sup>89</sup> Development finance institutions, such as Indian Renewable Energy Development Agency Ltd (IREDA),<sup>90</sup> National Bank for Agriculture and Rural Development (NABARD),<sup>91</sup> Small Industries Development Bank of India (SIDBI),<sup>92</sup> Power Finance Corporation Ltd. (PFC),<sup>93</sup> and Rural Electrification Corporation Ltd. (REC),<sup>94</sup> offer credit lines and financing schemes for climate-related investments. SEBI's Business Responsibility and Sustainability Reporting (BRSR) framework, green bond guidelines and IFSCA's guidance on sustainability-linked lending have improved disclosure quality and investor confidence in climate-related investments. RBI has also introduced the green deposit framework that optimises the flow of credit to green activities/projects by channelising institutional and household savings, with guardrails in place to overcome greenwashing challenges. Chart X.5 provides an overview of the major financial regulations introduced in recent years in this context.

10.69. The financing of disaster risks in India has also evolved beyond response and relief (through the State/National Disaster Response Fund) to incorporate risk mitigation, reconstruction, and recovery, as well as prevention, under the State Disaster Mitigation Fund (SDMF)<sup>95</sup> and the National Disaster Mitigation Fund (NDMF),<sup>96</sup> institutionalised as part of the Disaster Management Act 2005. These funds aim to reduce the risks, impact, or effects of disasters through project-based funding, encouraging local-level and community-based interventions. The Glacial Lake Outburst Flood Mitigation

89 19 DEC 2023 India's renewable energy sector has received FDI equity investment of \$ 6.1 billion during April 2020 – September 2023: Union Minister for Power and New & Renewable Energy. <https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=1988293&reg=3&lang=2>

90 <https://www.ireda.in/schemes>

91 <https://www.nabard.org/about-departments.aspx?id=5&cid=2788>.

92 <https://www.sidbi.in/uploads/financialreport/Annual-Report-for-FY-2024-25-Part-1.pdf>

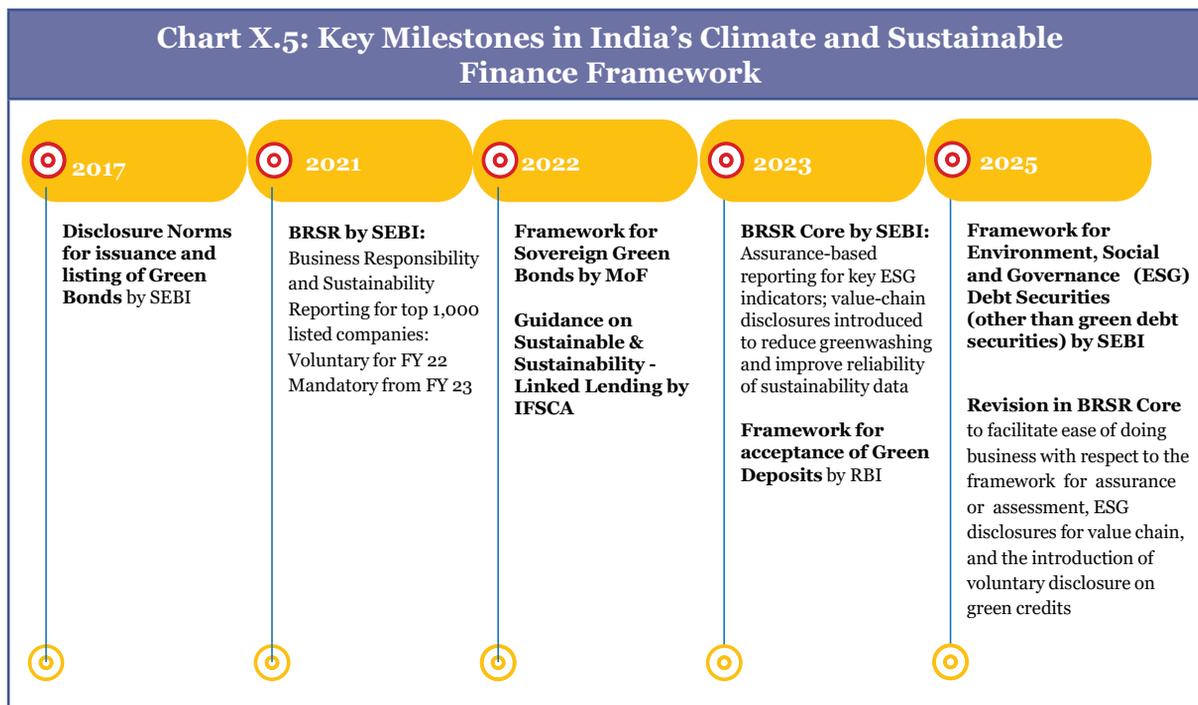
93 [https://www.pfcindia.co.in/ensite/DocumentRepository/ckfinder/files/Investors/ESG\\_Report/ESG%20Standalone%20report%20FY%202024-25.pdf](https://www.pfcindia.co.in/ensite/DocumentRepository/ckfinder/files/Investors/ESG_Report/ESG%20Standalone%20report%20FY%202024-25.pdf).

94 <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2002548&reg=3&lang=2>.

95 Ministry of Home Affairs, Government of India. (2022, January 14). Guidelines on constitution and administration of the State Disaster Mitigation Fund (SDMF) based on the recommendations of the Fifteenth Finance Commission 2021–22 to 2025–26 [PDF]. Retrieved December 28, 2025, from <https://tinyurl.com/49xk678v>.

96 Ministry of Home Affairs, Government of India. (2022, February 28). Guidelines on constitution and administration of the National Disaster Mitigation Fund (NDMF) based on the recommendations of the Fifteenth Finance Commission 2021–22 to 2025–26 [PDF]. Retrieved December 28, 2025, from <https://tinyurl.com/hswd7jr6>.

Programme has been recently approved under NDMF to monitor glaciers and glacial lakes in the Indian Himalayan region.<sup>97</sup>



10.70 Despite these measures, challenges persist in accessing finance at scale in India. The cost of capital for climate projects remains high, access to multilateral finance is often complex, and long-term international capital from institutional investors remains limited. Risk-mitigation and risk-sharing mechanisms are still underdeveloped, particularly for emerging technologies and large-scale adaptation projects.

10.71 The following section discusses a two-pronged strategy for scaling up finance for climate action from both domestic and international sources.

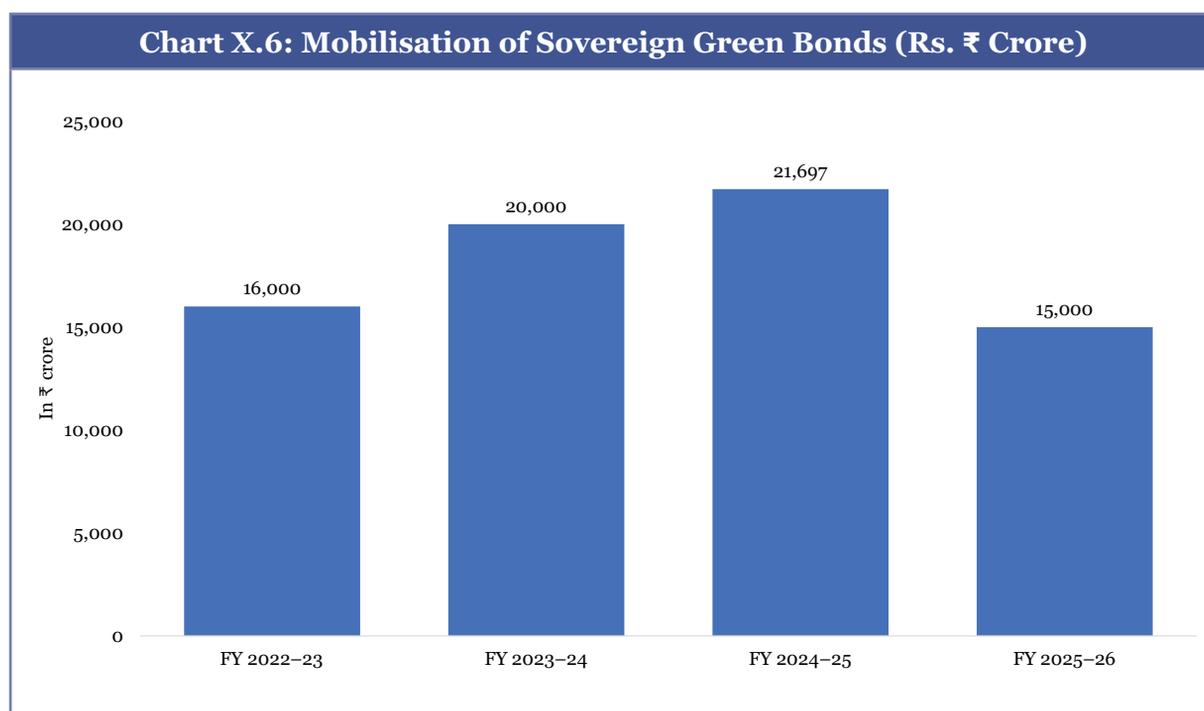
## Strengthening the Domestic Financial System

### Deep and Liquid Bond Markets

10.72 Bond markets are crucial for financing climate infrastructure, which requires substantial upfront capital and extended repayment horizons. Deeper, more liquid bond markets can provide long-term, stable, and scalable financing at predictable costs. On one hand, mature markets are important for attracting investments from institutional investors, which have long-term capital at their disposal. On the other hand, bond markets provide an important platform for local administrative bodies to raise local-currency finance for climate-aligned functions, such as water supply, waste

<sup>97</sup> Press Information Bureau. (2025, February 4). GLOF mitigation project. Retrieved December 28, 2025, from <https://tinyurl.com/msfhz4kr>.

management, and green energy, tailored to area-specific adaptation and resilience needs. Urban local bodies in Indore, Ghaziabad, Ahmedabad, and Vadodara have issued green bonds in line with SEBI's green bond framework (Table X.I). Municipal green bonds can unlock USD 2.5–6.9 billion for local bodies driven climate action over the next 5–10 years.<sup>98</sup> Besides, government of India has now issued sovereign green bonds worth ₹15,000 crore in FY26, with the cumulative issuance reaching ₹72,697 crore since FY23 (ChartX.6).<sup>99</sup>



**Table X.1: Municipal Green Bonds issues in India**

Municipal corporation	Date of issuance	Amount Raised (₹crore)	Use of proceeds	Tenure
Vadodara	Feb-24	100	Water treatment	5
Ahmedabad	Feb-24	200	Water treatment	5
Indore	Feb-23	244	Solar plant	3 to 9
Ghaziabad	May-25	150	Sewage Treatment	4.02 to 10.02

Source: ESG Debt Securities, SEBI. Accessed on 27 December 2025 from: <https://www.sebi.gov.in/statistics/greenbonds.html>.

<sup>98</sup> Bibhudatta, A., & Rathee, D. (2025). Unlocking Green Finance for India's Urban Local Bodies through Municipal Green Bonds.

<sup>99</sup> Date provided by Public Debt Management Agency, DEA.

### Box X.7: Greenium in Sovereign Green Bond Markets — Cross-Country Comparison and Market Issues<sup>100</sup>

Greenium—the yield advantage of green bonds over comparable conventional bonds—has been observed across several sovereign issuers, but its magnitude and persistence vary significantly by market. Cross-country experience shows that greenium outcomes depend less on investor intent alone and more on market design, liquidity, credibility, and reporting frameworks.

#### Key Market Issues Affecting Greenium across Countries

Country	Greenium	Key Market Strengths	Key Constraints
European Union	~2 bps, stable	Large benchmark-sized issuances; strong supranational credit quality; robust allocation & impact reporting; deep investor base	Limited scope for higher Greenium due to already low yields and very high liquidity in conventional EU debt.
United Kingdom	Small but positive, episodic	Integration with gilt programme; focused issuance strategy; strong institutional investor participation	Initial fragmentation across maturities; Greenium sensitive to overall gilt market volatility
France	~2–5 bps, consistent	Early mover advantage; large issue sizes; strong ESG investor base; detailed impact reporting	Complexity of reporting across many eligible sectors increases monitoring costs
India	Intermittent, 0–6 bps	Clear sovereign green bond framework; strong domestic institutional demand; policy signalling value	Limited secondary market liquidity; smaller issue sizes; fragmented issuance; lagged impact reporting; green bonds largely held to maturity
Emerging Markets (general)	Weak or absent	High climate investment needs; growing ESG interest	Higher sovereign risk premiums; currency risk; shallow bond markets; weak benchmark comparability

International experience shows that greenium is not automatic and tends to be durable only when sovereign green bonds are issued in large, liquid benchmark sizes, allow clear comparability with conventional bonds, provide credible and timely allocation and impact reporting, and are embedded within a stable sovereign debt programme.

From the foregoing, it could be assessed that, in India, the modest and episodic greenium observed so far does not necessarily reflect a lack of investor interest. Deepening secondary

<sup>100</sup> RBI-NIPFP study for DEA, Factors determining the presence of Greenium in Sovereign Green bonds

market liquidity, consolidating issuances into benchmark sizes, and strengthening post-issuance reporting can help translate into a more significant cost-of-capital advantage over time.

**10.73 Strengthening National development finance institutions** – Specialised financial institutions such as IREDA, NABARD, SIDBI, PFC, and REC are already working in the low-carbon/renewable energy space, promoting the adoption of sustainability practices and encouraging green investments through key initiatives and schemes. These institutions support climate project preparation and augment the bankability of projects through catalytic capital, which closely intersect with India’s development priorities including climate action. Further strengthening of the financial ecosystem through the mobilisation of blended finance, de-risking of projects, and capacity building through technical assistance and training are vital for enhancing the flow of resources for climate action.

**10.74 Availability of insurance cover against climate risks** – Expanding insurance coverage is essential to safeguard people against economic losses associated with the physical risks of climate change, but it also improves the creditworthiness of climate-exposed borrowers such as farmers and MSMEs. In India, the role of insurance is particularly significant for the agriculture sector, and is discussed in greater detail in Chapter VI Agriculture and Food Management.

## International Climate Finance and the Role of Multilateral Development Banks

**10.75** International climate finance is critical for the global response to climate change. Article 9, subparagraph 1 of the Paris Agreement clearly mandates developed countries to provide financial resources to developing countries for their climate action, in line with equity and the principle of common but differentiated responsibilities and respective capabilities, in light of national circumstances. With respect to international commitments on climate finance – the USD 100 billion annual goal till 2025, while developed countries reported providing USD 115.9 billion in climate finance to developing countries in 2022,<sup>101</sup> these figures are widely contested, with contrasting estimates suggesting that actual provision may be only USD 28–35 billion.<sup>102</sup> With the continuing lack of clarity on climate finance provision under the Paris Agreement, COP 30 in November 2025, in Belem, Brazil, arrived at an important decision on Article

<sup>101</sup> OECD (2024), Climate Finance Provided and Mobilised by Developed Countries in 2013-2022, Climate Finance and the USD 100 Billion Goal, OECD Publishing, Paris, <https://doi.org/10.1787/19150727-en>. Retrieved on 27 December 2025 from <https://tinyurl.com/49u3j6je>.

<sup>102</sup> Oxfam & CARE. (2025). Climate Finance Shadow Report 2025: Analysing progress on climate finance under the Paris Agreement. CARE Climate Change (CARE) & Oxfam Policy & Practice (Oxfam). Retrieved on 27 December 2025 from <https://tinyurl.com/5n77trm5>.

9.1 of the Paris Agreement, establishing a two-year work programme under the COP.<sup>103</sup> This outcome helps shift the focus back to obligations rather than private investments being counted as climate finance.

10.76 The disparity between climate vulnerability and financial capacity among nations needs to be acknowledged and addressed to ensure an effective global response to climate change, which is currently limited by both the insufficient volume of finance and high capital costs for developing countries. These costs are shaped by factors such as credit ratings, risk perceptions, and the structure of the global financial system.

#### **Box X.8: Sustainable and Climate Finance — Plenty of Capital, Limited Risk Appetite<sup>104</sup>**

Despite sustained global efforts, financing for climate action remains far below requirements, particularly in developing countries. The impacts are evident in persistent energy poverty and rising climate vulnerability. The core challenge is not a shortage of global capital, but a structural misalignment between abundant liquidity and risk appetite.

Global capital markets are flush with funds, yet flows to sustainable development and climate projects in the Global South remain constrained by entrenched risk aversion embedded in the architecture of global finance. This is most evident in the operating models of Multilateral Development Banks (MDBs) and in the prudential regulations of developed countries. MDBs continue to prioritise low-risk, sovereign-backed lending and the preservation of AAA ratings, limiting balance-sheet recycling and private capital mobilisation. A shift toward balance-sheet optimisation—from “originate-to-hold” to “originate-to-share”—is essential to reposition MDBs as global risk managers, utilising guarantees, insurance, and blended finance to attract private investment.

These constraints are reinforced by regulatory frameworks such as Basel III and Solvency II, which impose high capital charges on long-term, MDB-backed infrastructure investments in emerging economies, effectively excluding large pools of private capital. Further, an asset-class mismatch persists: institutional investors prefer standardised, liquid securities, while developing-country projects are bespoke and fragmented.

Unlocking scale requires MDB recapitalisation, strategic use of public capital as first-loss finance, regulatory recalibration, and strong governance safeguards. Reforms across MDB mandates, global regulations, and domestic financial systems are critical to align climate action with development priorities and deliver inclusive, resilient growth.

<sup>103</sup> Press Information Bureau. (2025, November 23). India welcomes key outcomes at UNFCCC COP30; reaffirms commitment to equity, climate justice and global solidarity [Press release]. Government of India. Retrieved December 28, 2025, from <https://tinyurl.com/4nb5k2c8> and Third World Network. (2025, November 24). COP30 ends with delicate Belém Political Package amid developing country concerns. Retrieved December 28, 2025, from <https://tinyurl.com/3kejvyr9>.

<sup>104</sup> CEA address ASPIRE to Scale Reimagining Development Finance: Blended and Innovative Finance Tools for Asia's Economic Growth - Date: 14 October 2025

Recent innovations demonstrate how targeted risk-sharing can unlock private capital for climate action. In 2025, the Inter-American Development Bank and the Central Bank of Brazil<sup>105</sup> established a mechanism to unlock up to USD 3.4 billion in long-term foreign-exchange hedging, directly addressing a key deterrent to investment in emerging markets. By mitigating currency risk without adding to sovereign debt, the arrangement enhances project bankability and demonstrates how MDB balance-sheet optimisation can attract private finance. Such approaches highlight the need for a broader shift from risk avoidance to active risk management in global climate finance.

10.77 These outcomes highlight structural weaknesses in the international financial system. Current global capital allocation often overlooks the long-term benefits of investing in climate solutions, as well as the role of public policy and international cooperation. As a result, developing countries must manage their climate action-related investments with shorter-term loans, higher risk premiums, and a greater need to utilise their own resources, which limits their ability to implement effective climate action.

10.78 Developing countries' climate efforts will depend on a range of systemic reforms that must be coordinated across MDB mandates, global regulations, blended finance tools, and domestic financial systems. These changes can help align climate action with development goals, support economic resilience, and encourage inclusive growth. However, it is important that such adjustments do not divert capital away from other development priorities.

10.79 Blended finance tools, particularly those involving government support, should be utilised with caution. While such instruments help in attracting private investment, they also create fiscal trade-offs for governments. Using public sector funds to de-risk climate projects for private investors can create liabilities and put more pressure on the limited fiscal space if the risks materialise. Strategies for scaling finance for climate action should strike a balance between attracting investment and the need for fiscal responsibility, transparency, and long-term debt sustainability. In that regard, it is to be mindful of the fact that excessive use of foreign currency borrowing also exposes projects to exchange rate risks, increasing forex premiums and financing costs, ultimately impacting consistency in climate action. Strong governance frameworks are necessary to ensure that climate finance supports growth and resilience without compromising macroeconomic stability.

<sup>105</sup> Organisation for Economic Co-operation and Development. (2024). Case study – Foreign private capital mobilisation and currency hedging: Inter-American Development Bank and Brazil (OECD Case Studies). Retrieved December 28, 2025, from <https://tinyurl.com/t97m4dd3>.

## Regulation: Streamlining environmental governance for growth

10.80 Environmental regulation finds its theoretical basis in welfare economics, recognising pollution as a negative externality that leads to market failure if left unchecked. Environmental regulation assumes a central role, not merely to correct these market failures, but to enable sustainable growth.

10.81 Traditionally, environmental regulation has been guided by Pigouvian welfare economics,<sup>106</sup> command-and-control approaches,<sup>107</sup> which prescribe emission standards or technology norms that provide certainty but often impose high compliance costs and weak incentives for innovations.<sup>107</sup> This approach often entails higher compliance costs and may weaken incentives for innovation. In contrast, market-based instruments, such as pollution taxes, tradable permits, and emissions trading, offer greater flexibility and cost-efficiency. More recent regulatory theories,<sup>108</sup> including the toolkit prepared by OECD,<sup>109</sup> emphasise risk and outcome-based regulation, calibrating stringency to environmental risk and assessing compliance by results rather than processes. Thus, well-designed regulations can reduce unnecessary burdens, promote innovation, and reconcile environmental protection with ease of doing business.<sup>110</sup>

## Evolution of Environmental Regulation in India

10.82 Environmental policymaking in India gained momentum in the aftermath of the 1972 Stockholm Declaration. This led to the enactment of the Water (Prevention and Control of Pollution) Act, 1974, which laid the institutional foundation for pollution control by establishing State-level Pollution Control Boards (SPCBs) to prevent and control water pollution. These Boards were vested with the authority to initiate suo-motu action against violations of environmental laws. To complement this framework, the Water (Prevention and Control of Pollution) Cess Act, 1977, was introduced, enabling the levy of a cess on polluting and water-intensive industries based on their water consumption.

10.83 The Bhopal Gas Tragedy of 1984 marked a critical turning point in India's environmental governance with the enactment of the Environment (Protection) Act, 1986 (EPA). The EPA functions as an umbrella legislation that confers powers on the central government to regulate environmental pollution, enforce compliance, and issue subordinate rules and notifications. The three core statutes, i.e., the Water Act, the Air

---

106 Pigou, A. C. (1951). Some Aspects of Welfare Economics. *American Economic Review*, Vol. 41, No. 2 (Papers and Proceedings of the Sixty-Third Annual Meeting of the American Economic Association), pp. 287–302.

107 Baumol, W. J., & Oates, W. E. (1988). *The theory of environmental policy*. Cambridge university press.

108 Gunningham, N., Grabosky, P., & Sinclair, D. (1998). *Smart regulation: Designing environmental policy*. Oxford University Press,.

109 OECD (2014) *Regulatory Enforcement and Inspections toolkits*.

110 Porter, Michael E. (1991). *America's Green Strategy*. *Scientific American*, Vol. 264, No. 4, pp. 168.

Act, and the EPA, established the command and control framework for environmental regulation in India. In addition, the introduction of the Environmental Impact Assessment (EIA) Notification, 1994, and its replacement by the EIA Notification, 2006, institutionalised ex-ante environmental regulation.<sup>111</sup> The EIA regime requires prior environmental clearance for specified categories of projects, incorporating screening, scoping, public consultation, and expert appraisal. Judicial intervention has played a significant role in shaping environmental regulation in India. The establishment of the National Green Tribunal (NGT) in 2010 strengthened enforcement but also increased regulatory scrutiny and litigation risks

10.84 Over time, in India, more flexible, incentive-based mechanisms have been introduced. At the national level, the Perform, Achieve and Trade (PAT) scheme, which was launched in 2012, introduced a baseline-and-credit system that creates tradable Energy Saving Certificates (ESCerts) for industrial units that outperform their energy efficiency targets, incentivising innovation and cost-effective efficiency improvements rather than just imposing fixed standards. Recently, the framework for the Indian carbon market under the CCTS has been formulated. Yet another is the ETS for particulate matter, the first of its kind in the world, launched in Surat, Gujarat (Box X.9).

#### Box X.9: Do Pollution Trading Schemes Work in Developing Countries?

In the United States and the European Union, pollution markets have been widely praised for translating sound economic theory into effective environmental policy. However, progress has been limited in developing countries. This is due to the assumption that market-based environmental regulations are rare in developing economies, and state capacity is also weak. In addition, regulators in developing countries often struggle to monitor emissions effectively and may lack the credibility or enforcement power required to ensure that polluters hold permits for every unit of emissions.

However, the seminal work by Greenstone et al (2023)<sup>112</sup> sets aside this argument and provides the first experimental evaluation of a particulate matter emissions trading market, the first of its kind globally implemented in a large Indian city of Gujarat (Surat). The scheme covered 317 industrial plants and was supported by the mandatory installation of Continuous Emissions Monitoring Systems (CEMS) for large particulate sources. The programme replaced a conventional command-and-control framework based on technology requirements and concentration standards. The findings brought out that (a) the market functioned effectively, with active permit trading and near universal compliance, (b) plants participating in the emissions market reduced particulate emissions by 20-30 per cent compared to plants regulated under the status quo regime and (c) for a given level of

<sup>111</sup> Turaga, R. M. R., & Sugathan, A. (2020). Environmental regulations in India. *Oxford research encyclopaedia of environmental science*.

<sup>112</sup> Greenstone, M., Pande, R., Ryan, N., & Sudarshan, A. (2025). Can pollution markets work in developing countries? Experimental evidence from India. *The Quarterly Journal of Economics*, 140(2), 1003-1060.

emissions, the market reduced abatement costs by 11–14 per cent, reflecting differences in firms' marginal abatement costs.

This suggests that when supported by credible monitoring infrastructure, pollution markets can deliver significant emissions reductions at lower compliance costs even in lower-capacity settings.

### **Recent reforms in Environmental Clearance and Related Regulations<sup>113</sup> include:**

10.85 Rationalisation and predictability in regulations have been a specific area of concern for the government. India's environmental regulatory framework is undergoing a gradual shift towards a governance model that involves expanding risk-based and outcome-oriented regulations, increasing the use of market-based instruments, strengthening the capacity and accountability of SPCBs, and enhancing regulatory predictability. Even so, several critical challenges remain, including the multiplicity of clearances and overlapping jurisdictions, weak post-clearance monitoring, capacity constraints within SPCB, significant inter-state variation in implementation, and high litigation-related uncertainty.

10.86 The Government of India has undertaken numerous measures to reform environmental governance, aligning environmental protection, climate commitments, and ease of doing business. These reforms focus on simplifying approvals, strengthening compliance, leveraging digital technologies, and transitioning to a trust-based, outcome-oriented regulatory framework.

10.87 At the centre of this transformation is PARIVESH (Pro-Active and Responsive facilitation by Interactive, Virtuous, and Environmental Single Window Hub) 3.0, a nationwide single-window digital platform for environmental clearances and post-approval compliance monitoring. The system integrates baseline environmental data, compensatory afforestation land banks, inter-ministerial dashboards, and AI-enabled 24×7 support, significantly improving transparency, predictability, and administrative efficiency.

10.88 Compliance oversight has been strengthened through the Environment Audit Rules, 2025, which have introduced certified third-party environmental auditors under major environmental statutes. This reform enhances credibility while reducing procedural burden on regulators. In parallel, following amendments of the Water Act and the Air Act, the Government of India has issued uniform guidelines for the grant of consent to establish and operate for industries across all SPCBs in the country.

---

<sup>113</sup> Inputs provided by MoEFCC.

10.89 Environmental regulations have been rationalised based on pollution potential. Industry classifications have been updated to Red, Orange, Green, Blue, and White<sup>114</sup> categories, to promote transition towards better compliance. Compressed Bio-gas (CBG) plants (excluding those using industrial/process waste) are classified as Blue; those generating by-products using electricity fall under White.

10.90 Given the strategic importance of critical minerals and to support development in line with climate priorities of India, regulations related to mining projects of Critical, Strategic, and Atomic Minerals have been streamlined.<sup>115</sup>

10.91 Ecosystem-based approaches and restoration are being incentivised through the Afforestation and Green Credit Programme that encourages public and private participation in compensatory afforestation and degraded forest restoration. Circular economy goals are being advanced through Circular Economy Action Plans covering 10 waste categories<sup>116</sup> and Extended Producer Responsibility (EPR) frameworks for multiple waste streams,<sup>117</sup> supported by centralised digital portals. As on 14 November 2025, total 69,116 producers and 4,377 recyclers have been registered on the portal. Approximately 308 lakh tonnes of waste (plastic packaging waste, battery waste, e-waste, waste tyres) has been recycled with corresponding EPR certificates generation of 296.53 lakh tonnes, out of which 236.93 tonnes has been transferred to producers.

10.92 To address plastic pollution, 12 identified single-use plastics (SUPs)<sup>118</sup> having high littering potential and low utility banned from 1 July 2022. National and state level task forces have been formed to eliminate identified SUPs and for effective implementation of the Plastic Waste Management Rules. For effective monitoring of ban on identified SUP items and plastic waste management in the country, an online platforms (a) National Dashboard for monitoring of comprehensive action plan implementation, (b) Central Pollution Control Board (CPCB) Monitoring Module for Compliance on Elimination of

114 The category of the sector is decided based on the following ranges of Pollution Index:

- i. Red:  $PI \geq 80$ ,
- ii. Orange:  $55 \leq PI < 80$ ,
- iii. Green:  $25 \leq PI < 55$ ,
- iv. White:  $PI < 25$ ; and

Industries providing essential environmental services for managing domestic waste are classified as 'Blue' with an extended Consent validity of 2 years.

115 MOEFCC. Information retrieved on 14 January 2026, from <https://tinyurl.com/5n6z88ku>.

116 Lithium-ion batteries; E-waste; Toxic and hazardous industrial waste; Scrap metal (ferrous and non-ferrous); Tyre and Rubber; End of Life Vehicles; Gypsum, Used Oil, Solar Panels and Municipal Solid Waste.

117 plastic packaging waste, battery waste, e-waste, waste tyres, used oil, end-of-life vehicles, construction and demolition waste, and scrap of non-ferrous metals.

118 ear buds with plastic sticks, plastic sticks for balloons, plastic flags, candy sticks, ice-cream sticks, polystyrene [Thermocol] for decoration; Plates, cups, glasses, cutlery such as forks, spoons, knives, straw, trays, wrapping or packing films around sweet boxes, invitation cards, and cigarette packets, plastic or PVC banners less than 100 micron, stirrers.

SUP and (c) CPCB Grievance Redressal App are in operation. Additionally, the thickness of plastic carry bags was increased to 120 microns making them easier to recycle.

10.93 The Environment Protection (Management of Contaminated Sites) Rules, 2025, establish a framework for identifying and remediating contaminated sites. Biological Diversity (Access to Biological Resources and Knowledge Associated thereto and Fair and Equitable Sharing of Benefits) Regulations, 2025 aim to regulate access to India's biological resources and associated traditional knowledge including for digital sequence information.

10.94 The Public Liability Insurance Act amended through the Jan Vishwas Act decriminalises offences through penalty in place of imprisonment and relief/compensation for deaths/fatalities in case of accidents was increased from ₹ 25,000/- to ₹ 5 lakh. It allows utilisation of the Environmental Relief Fund of ₹ 1,100 crore for the remediation of contaminated sites. The rates of relief were shifted from the Act to the rules to ensure greater flexibility. Through this act, the Ministry has decriminalised "the Environment (Protection) Act, 1986, the Air (Prevention and Control of Pollution) Act, 1981 and the Indian Forest Act, 1927. Apart from it, "Water" being a subject falling under the "State List", the criminal Provisions of the Water (Prevention and Control of Pollution) Act, 1974 have been amended under Article 252(1) of the Constitution of India. All the above four Acts have been decriminalised and have rationalised minor offences to further enhance trust-based governance for ease of living and doing business.

10.95 In October 2025,<sup>119</sup> green belt requirements for industries were rationalised based on the pollution potential of industrial estates/parks and individual industries, eliminating previous norms that required an overall green cover of 33 per cent of the industrial estates. The new norms require more polluting industries to have a greater green cover.

10.96 Collectively, these reforms are streamlining approvals, reducing compliance costs, strengthening monitoring, and thereby aligning environmental governance with India's development and climate objectives. These reforms also represent a decisive shift toward trust-based environmental governance.

#### Box X.10: Balancing Growth and Green Initiatives...Some evidence

Tamil Nadu, Kerala, and Andhra Pradesh have not only enhanced their business environments by integrating sustainability measures but have also, through the Business Reform Action Plan (BRAP), reduced the time taken for environmental clearances.

<sup>119</sup> Ministry of Environment, Forest and Climate Change, Government of India. (2025, October 29). *Rationalizing the requirement of green belt/green cover for industrial estates/parks and individual industries based on pollution potential [Office memorandum/Notification]*. Retrieved December 28, 2025, from <https://tinyurl.com/ytyd5988>.

Kerala has, under the BRAP 2024,<sup>120</sup> streamlined business registration, digitised land and tax processes, and simplified environmental clearances. The state also advanced renewable energy adoption, carbon-neutral gram panchayats, and waterbody rejuvenation.<sup>121</sup>

Tamil Nadu has enhanced the ease of doing business through single-window clearances, digitised approvals, and land reforms, while promoting solar parks, district-level decarbonization plans, and energy efficiency programs. The Tamil Nadu Pollution Control Board actively monitors industrial effluent treatment systems and supports the establishment of Common Effluent Treatment Plants for clusters of small-scale and pollution-intensive industries, such as tanneries and textile units, to ensure treated wastewater meets prescribed environmental standards before discharge.<sup>122</sup> Andhra Pradesh, in BRAP 2024, implemented single-window industrial clearances, online land registration, and e-environmental approvals. Recently, Andhra Pradesh has expanded its Online Consent Management & Monitoring System, allowing firms to apply for consents and track approvals digitally, reducing delays and enhancing data transparency between industry and the Pollution Control Board.<sup>123</sup>

## Conclusion: Towards a green, resilient and competitive India

10.97 According to the synthesis report by UNFCCC, which compares the NDC targets of countries with their self-reported emission projections for 2030, none of the developed countries were on track to meet their 2030 emission reduction targets with their mitigation actions in 2020,<sup>124</sup> despite having an abundance of means of implementation – finance and technology. Even the new NDCs for 2035 of major developed economies show only limited enhancement in their climate mitigation goals, backpedalling on their commitments under the Paris Agreement, despite the fact that these countries reached their peak emissions decades ago, vis-à-vis developing countries like India. To add to the weakening of global efforts against climate change, the climate finance commitments to the developing countries continue to remain diluted. The clear signals from the global north, which are dithering on their own climate action, warrant that India must place adaptation centre stage in India's climate action story to ensure that development gains are not lost.

<sup>120</sup> Department for Promotion of Industry and Internal Trade (DPIIT): Business Reform Action Plan (BRAP) Reports, Government of India.

<sup>121</sup> NITI Aayog. (2024). SDG India Index 2023-24. Government of India. Retrieved December 28, 2025, from <https://tinyurl.com/4ca4ku4a>.

<sup>122</sup> Tamil Nadu Pollution Control Board. (2025). Policy Note 2025–2026: Environment and Climate Change [PDF]. Government of Tamil Nadu. Retrieved December 28, 2025, from <https://tinyurl.com/3beumyy3>.

<sup>123</sup> Andhra Pradesh Pollution Control Board. (n.d.). Online Consent Management & Monitoring System (APPCB OCMMS). [https://apocmms.nic.in/APPCB/?utm\\_source](https://apocmms.nic.in/APPCB/?utm_source).

<sup>124</sup> Para 190 in United Nations Framework Convention on Climate Change. (2023, June 21). Compilation and synthesis of fourth biennial reports of Parties included in Annex I to the Convention: Revised report by the Secretariat, Addendum (FCCC/SBI/2020/INF.10/Add.1/Rev.2) [Advance version]. Retrieved December 28, 2025, from <https://tinyurl.com/2kur6h8j>.

10.98 The chapter underscores that climate action is no longer an environmental add-on but a core component of India's development strategy. For India, adaptation has rightly emerged as the cornerstone of climate-resilient growth, delivered primarily through public investment, state-led planning, and community institutions. The evolution of SAPCCs from mitigation-oriented documents to development-integrated adaptation frameworks reflects a growing recognition that resilience outcomes—such as water security, stable livelihoods, disaster risk reduction, and ecosystem services—are best achieved through locally grounded and institutionally embedded interventions.

10.99 India has not yet reached its peak energy demand, and ensuring energy access, affordability, and security remains central to our development pathway. India's mitigation strategy reflects pragmatism rather than prescriptiveness. Rapid growth in renewable energy, advances in energy efficiency, expansion of nuclear power, development of green hydrogen, strengthening of carbon sinks, and the operationalisation of carbon markets demonstrate how mitigation can be aligned with energy security, industrial competitiveness, and job creation. India's approach acknowledges the limits of one-size-fits-all transitions and emphasises system reliability, affordability, and domestic manufacturing capabilities.

10.100 Climate finance remains the binding constraint. The gap between global capital availability and climate investment needs in developing countries reflects structural weaknesses in the international financial architecture rather than a lack of ambition or bankable projects. India's experience highlights the importance of robust domestic financial markets, strong development banks, effective municipal finance, and credible regulatory frameworks. However, domestic resources alone cannot meet the required investment scale. Reforms to multilateral development banks, the greater use of risk-sharing and blended finance, recalibration of credit rating practices, and predictable concessional finance are essential to lowering the cost of capital and attracting private investment.

10.101 Raising climate ambition in India—especially on mitigation—without corresponding support in finance and technology is neither realistic nor equitable. A credible and orderly transition from fossil fuels depends on the timely availability of reliable, non-fossil energy sources such as nuclear power, alongside a well-defined peak-emissions pathway. There could be a push towards establishing a credible national platform, backed by predictable and adequate international finance, that can help us develop climate projects, enhance their bankability, and enable the required climate action. This, in some ways, would balance climate action ambitions with the need for secure energy in the absence of viable scalable options. In the context of such a national platform, the focus could be on scaling up innovative mitigation and adaptation

technologies, as well as on research and development, led through collaboration with institutions and partners from developed countries.

10.102 Environmental regulation is increasingly becoming a facilitator of sustainable growth. India's thoughtful transition toward risk-based regulation, market-oriented instruments, digital compliance systems, and a framework of trust-based governance highlights the potential for environmental protection to coexist harmoniously with improved business operations. Insights from various Indian states indicate that factors such as regulatory predictability, administrative capacity, and the adoption of technology are crucial

10.103 Taken together, the chapter highlights that India's climate pathway is anchored in development realism. Climate action is pursued not through abrupt transitions or externally imposed models, but through adaptive institutions, domestic capacity building, and policy coherence. As climate risks intensify and global transitions accelerate, India's experience offers a development-centric framework, one that integrates resilience, competitiveness, and sustainability, demonstrating that economic growth and environmental stewardship can advance together rather than in opposition.

\*\*\*

*This page has been left blank*

# EDUCATION AND HEALTH: WHAT WORKS AND WHAT'S NEXT



*India's journey toward Viksit Bharat hinges on inclusive growth and upward social and economic mobility for every citizen. The development model of India is based on the principle of leaving no one behind. The government is working towards this goal through multiple initiatives focused on enhancing education and healthcare, the core pillars of human capital and overall well-being.*

*In the education space, progress in school and higher education has been at the back of enhanced quality and access through community engagement, effective assessments, improved accountability, and stronger alignment between education and skill requirements. Building state capacity in higher education, fostering academia-industry collaboration, and expanding global engagement can further enhance the education system's responsiveness to the changing needs of the economy. Health outcomes have improved through infrastructure expansion and targeted policies. Emerging challenges, such as obesity, the rising burden of non-communicable diseases, and the psychological effects of digital exposure, require a stronger focus on preventive care and behavioural change strategies. This chapter presents good practices in dealing with emerging challenges from various parts of the country, offering valuable lessons for others to learn from. Enhancing education and healthcare through integrated, accountable, and adaptive policy frameworks is essential to building a future-ready workforce.*

## INTRODUCTION

11.1. Public health and education are mutually reinforcing pillars of human capital development, social well-being, and economic growth. In India, the progress in public health and education has been marked by notable achievements and continuing challenges. Over the years, the country has made significant improvements in increasing access to healthcare by providing better and more affordable facilities through public investment in health, including access to preventive and curative care, nutrition, and health insurance. Infant and maternal mortality rates have reduced, immunisation coverage has expanded, and access to primary healthcare services has improved. Initiatives like the National Health Mission, Ayushman Bharat, and various disease control programmes have contributed to these advancements.

11.2. Achievements in the education space have been marked by enhanced literacy rates, increasing enrolment in schools and higher education institutions, provision of vocational education avenues, etc. The Right to Education Act 2009 and the National Education Policy 2020 (NEP) have played a crucial role in shaping the education landscape by expanding access to quality education universally, promoting equity, and driving innovation in teaching and learning.

11.3. However, variations in quality, regional differences, and socio-economic factors continue to influence the equitable distribution of essential services. Both sectors also face digital divides and infrastructural gaps, and require investment and policy reforms for equitable development.

11.4. Against this backdrop, this chapter presents the progress in education and health in the country, along with challenges and future pathways. The first section discusses the crucial role education plays in developing human capital. It also covers community participation, classroom interventions, vocational education, policy initiatives to enhance the internationalisation of education, and capacity building for higher education. Section two highlights progress and challenges in the health system, focusing on policy initiatives to tackle obesity and the rising issue of digital addiction among Indian youth. Various other indicators of social progress, such as the extent of multidimensional poverty, the delivery of social justice, and the development of the country's rural hinterland, are discussed in detail in Chapter 13.

## **EDUCATION: ENHANCING QUALITY AND ACCESS**

### **Progress in school education**

11.5. School education forms the foundation of human capital and is central to shaping the nation's growth path towards Viksit Bharat @2047. Experiences from fast-growing Asian economies clearly demonstrate that consistent investments in education, skills development, and technology can significantly enhance productivity, foster innovation, and accelerate economic transformation.

11.6. Strengthening school education today is not just a sectoral reform, but an investment in India's future prosperity, productivity, and leadership in the decades ahead. India continues to enjoy a strong demographic advantage. In 2024, nearly 27 per cent of India's population was in the school-going age group (3–18 years).<sup>1</sup> Even by 2047, this age group will account for over 20 per cent. Despite a sizable population of school-going children, India's Education Index, as part of the UN's Human Development Index (HDI), remains modest, largely due to the relatively low expected years of schooling (EYS) trailing behind global peers.

<sup>1</sup> UN Population Division <https://tinyurl.com/y3ykhj4d>

**Table XI.1: Cross-country comparison of EYS**

Country	Per cent share of 3-18 aged population, 2024	HDI: Education Index (2025)	Projected per cent share of 3-18 aged population, 2047	EYS
India	26.94	0.372	20.14	13.0
China	18.78	0.626	10.44	15.5
Russia	18.97	0.768	15.72	13.2
Brazil	21.59	0.611	16.39	15.8
Japan	13.19	0.805	11.87	15.5
Germany	14.92	0.922	13.76	17.3
Indonesia	26.55	0.575	21.11	13.3
USA	19.39	0.882	17.14	15.9

Source: UN Population and UNDP, Human Development Report (2025)

11.7. To fully convert its vast human resource base into high-quality human capital, India needs to raise its EYS to 15-year set by NEP's 5+3+3+4 schooling structure for ages 3-18.<sup>2</sup> Achieving this requires a holistic, lifecycle approach that encompasses early childhood education, foundational literacy and numeracy (FLN), universal secondary schooling, and the seamless integration of vocational and digital skills.

11.8. Towards these goals, the NEP, the first major education policy reform in 34 years, aims to transform India's education system to address 21st-century challenges. It presents a flexible, inclusive, and learner-centric education approach, focusing on FLN and higher-order capacities such as critical thinking, problem-solving, and social and emotional intelligence. In school education, the policy emphasises Early Childhood Care and Education (ECCE), FLN, reducing dropouts, ensuring universal access, revamping curriculum and pedagogy, strengthening teacher capacity, promoting equity, and improving quality. In higher education, it seeks to restructure and consolidate institutions, promote multidisciplinary learning, strengthen faculty, promote vocational pathways, ensure equity and facilitate internationalisation. Key initiatives include the establishment of the National Research Foundation<sup>3</sup> and regulatory reforms aimed at driving innovation, excellence, and competitiveness in the education system.

11.9. To achieve the goals of NEP, the government launched school-level schemes such as the Sarv Shiksha Abhiyan, ULLAS<sup>4</sup>, PM-SHRI (PM-Schools for Rising India), PM POSHAN (PM Poshan Shakti Nirman) and initiatives, such as PARAKH, Vidya Pravesh, DIKSHA (Digital Infrastructure for Knowledge Sharing), NIPUN<sup>5</sup> Bharat Mission and Atal Tinkering Labs.

<sup>2</sup> In the NEP5+3+3+4 structure, a strong base of Early Childhood Care and Education (ECCE) from age 3 is included as part of formal education, which is aimed at promoting better overall learning, development, and well-being.

<sup>3</sup> Anusandhan National Research Foundation: <https://anrfonline.in/ANRF/About?HomePage=New>

<sup>4</sup> Understanding of Lifelong Learning for All in Society

<sup>5</sup> National Initiative for Proficiency in Reading with Understanding and Numeracy

## School infrastructure

11.10. India today operates one of the world’s largest school systems, serving 24.69 crore students across 14.71 lakh schools, supported by over 1.01 crore teachers (UDISE+ 2024-25).<sup>6</sup> Government schools constitute 69 per cent of all schools, enrolling nearly half of all students, while private schools account for 26 per cent of schools and 41 per cent of total enrolment. Aligned with the NEP goal of achieving a 100 per cent gross enrolment ratio (GER) from pre-primary to secondary education by 2030, steady progress has been observed across all school levels.<sup>7</sup> GER scores, as per NEP academic structure, are 41.4 at the foundational stage (Pre-Primary to Grade II)<sup>8</sup>, 95.4 at the preparatory stage (Grade III to Grade V), 90.3 at the middle stage (Grade VI to Grade VIII), and 68.5 at the secondary stage (Grade IX to Grade XII). Table XI.2 informs the achievements of various school education programmes of the government of India. Monitoring progress towards the NEP goal of 100 per cent GER by 2030 is being enabled through APAAR (Automated Permanent Academic Account Registry) IDs, which use Aadhaar-based authentication to digitally store academic records and track student enrolment and progression across school, higher, and skill education.

**Table XI.2: Achievement of school education programmes**

<p><b>PM SHRI Scheme</b>  <b>Aim:</b> To establish over 14,500 PM SHRI Schools nationwide with inclusive, comprehensive interventions for holistic transformation, focusing on equity, access, quality, and inclusion.  A total of 13,076 PM SHRI schools established in 33 states/UTs.  <b>Saturation with NEP-aligned features:</b> ICT and smart classrooms, skill education, digital libraries, integrated science labs, sports infrastructure, green practices, innovation councils and eco clubs, ‘Jadui Pitara’ and ‘Bagless Days’ for experiential learning.</p>	<p><b>Co-location of Anganwadi Centres (AWCs) with schools</b>  Aim to create a unified and strengthened ECCE system for universal access to high-quality early learning.  Co-located AWCs are present in 2,99,544 schools (32.9 per cent)  Balvatikas are present in 2,63,018 (28.9 per cent) villages  In total, 4,81,004 of the government and government-aided schools with Grade I (52.8 per cent) have some form of pre-school facility (Balvatika, co-located AWC, or both).</p>
--	---

6 Unified District Information System for Education (UDISE) Plus is an educational management information system under the Department of School Education & Literacy, Ministry of Education under the Government of India. <https://udiseplus.gov.in/#/en/home>

7 GER is the total enrolment in a particular level of school education, regardless of age, expressed as a percentage of the population of the official age-group which corresponds to the given level of school education in a given school year.

8 Lower GER at the foundational stage is due to GER being calculated using Pre-Primary enrolments in recognised schools as reported by States/UTs, which excludes Anganwadi enrolments and enrolments in standalone Private Pre-Primary Schools. As per previous academic structure GER scores are 90.9 at the primary stage (Grade I to V), 90.3 at the upper primary (Grade VI to VIII), 78.7 at the secondary stage (Grade IX and X) and 58.4 at the higher secondary stage (Grade XI and XII).

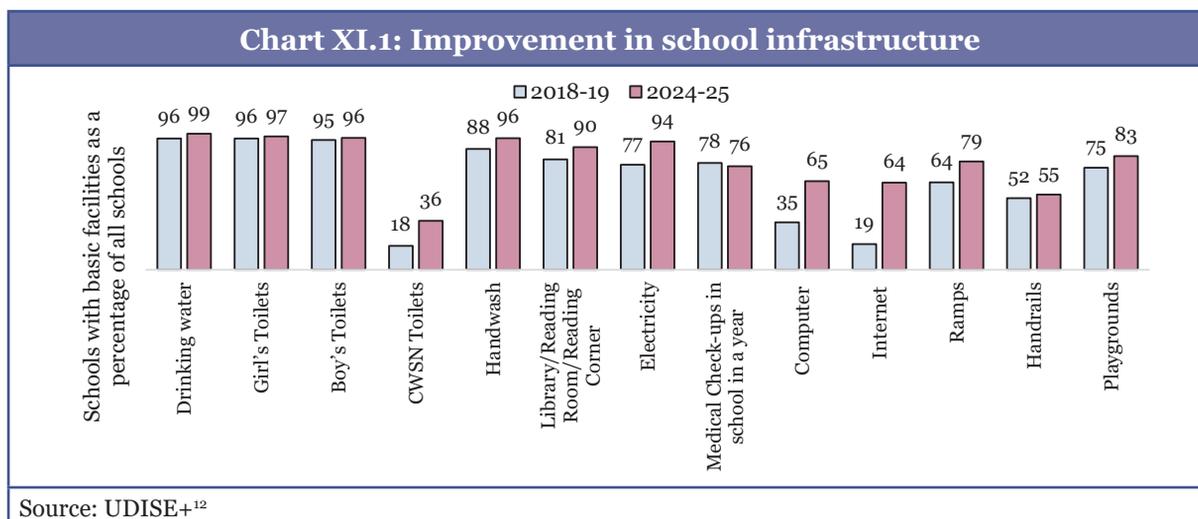
<p><b>Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN)</b></p> <p>Aimed at uplifting Particularly Vulnerable Tribal Groups (PVTGs) and ensuring their holistic development.</p> <p>Covers 75 PVTGs across 18 states and the UT of Andaman and Nicobar Islands.</p> <p>Provides meaningful education, life skills, and development opportunities.</p> <p>Expansion of residential education infrastructure: 500 hostels approved with a financial outlay of ₹1,255.24 crore.</p>	<p><b>Multilingual textbooks</b></p> <p><b>Jaadui Pitara:</b> Collection of 53 Learning Teaching Materials (toys, games, puzzles, story cards, etc.) for children aged 3-8 years.</p> <p><b>e-Jaadui Pitara:</b> Provides interactive content in multiple languages with AI-driven bots. It features over 3,000 e-contents and is accessible via the eJaadui Pitara webpage and mobile app.</p> <p><b>‘Kitab Ek Padhe Anek’:</b> Eight textbooks for Grades I &amp; II in an energised printed format, following the principle of UDL (Universal Design for Learning).</p> <p><b>Bharitya Bhasha Pustak Scheme:</b> Textbooks and study materials being offered for schools and higher education in 22 Indian languages in digital form.</p>
<p><b>Kasturba Gandhi Balika Vidyalayas (KGBVs)</b></p> <p>Residential schools for girls belonging to Socio-Economically Disadvantaged Groups in Educationally Backwards Blocks.</p> <p>By 31 March 2025, a total of 2,682 KGBVs had been upgraded, out of which 317 are up to Grade X and 2,365 are up to Grade XII.</p>	<p><b>Dharti Aaba Janjatiya Gram Utkarsh Abhiyan</b></p> <p>For the construction of residential hostels to improve educational access for tribal students.</p> <p>692 hostels have been sanctioned across 23 states/UTs in four phases, marking significant progress toward the scheme’s overall targets.</p>
<p style="text-align: center;"><b>ULLAS: Adult education scheme</b></p> <p>3.1 crore learners, 47 lakh volunteer teachers, and 1.7 crore neo-literates have been registered. <sup>9</sup>Ladakh, followed by Mizoram, Goa, Tripura and Himachal Pradesh, have achieved full literacy under the initiative.<sup>10</sup></p>	

11.11. Improvements in sanitation and information, and communication technologies (ICT) facilities indicate positive development in school infrastructure (Chart XI.1). The Time Use Survey Report 2024 reveals an increase in participation in learning activities among children aged 6-14 years from 85.9 per cent during 2019 to 89.3 per cent in 2024, and female participation in learning activities among this age group increased from 85.6 per cent to 89.5 per cent, during the same period.<sup>11</sup> Children in this age group spend approximately 413 minutes daily on learning. In rural areas, children dedicate 83 minutes to sports and exercise daily, compared to 68 minutes in urban areas.

<sup>9</sup> ULLAS dashboard: <https://ullas.education.gov.in/nilp> (As of 23 January 2026)

<sup>10</sup> PIB release of the Ministry of Education dated 28 July 2025: <https://tinyurl.com/mr25sx7r>

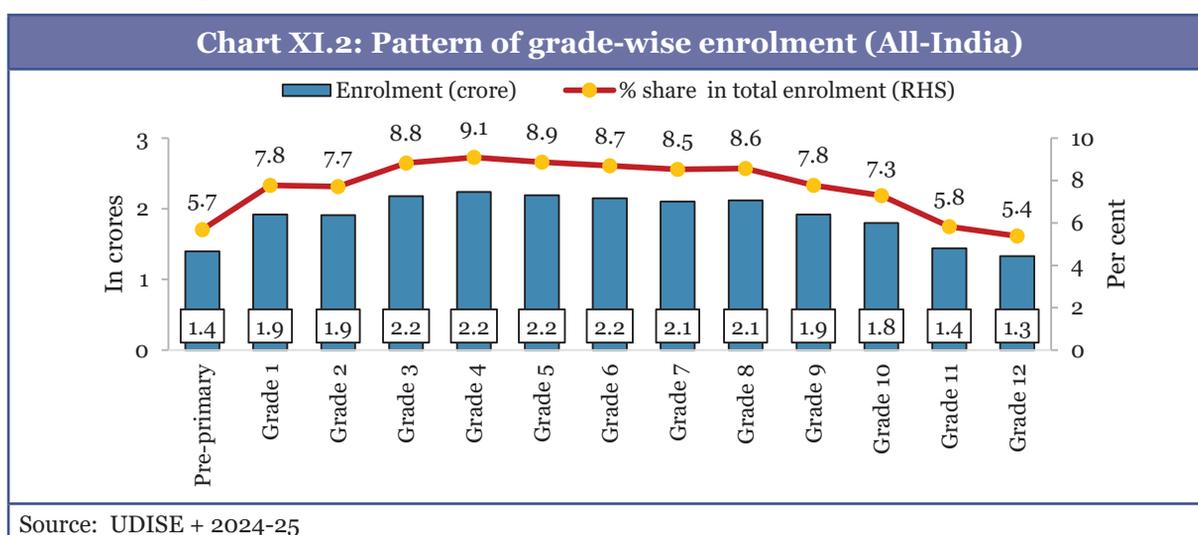
<sup>11</sup> The Time Use Survey (TUS) enables the measurement of the time individuals spend on different activities. <https://tinyurl.com/3u6nzjhb>



### Innovative pedagogy and community participation

11.12. While India has improved enrolment at early levels, the secondary age-specific net enrolment (NER) remains low at 52.2 per cent, highlighting the need to retain students beyond Grade VIII.<sup>13</sup> A key issue is the uneven distribution of schools: 54 per cent of schools offer only foundational-preparatory education, while just 17.1 per cent provide secondary education in rural areas. Urban areas have a higher share of secondary schools (38.1 per cent). This disparity limits rural students' access to higher-level classes, resulting in transition losses, increased travel time, and higher dropout rates.

11.13. These structural imbalances are reflected in enrolment patterns, with a drop in enrolment from the foundational and preparatory levels to the middle and to secondary levels in rural areas, whereas in urban areas, enrolment rises from the middle to the secondary level. Grade-wise enrolment trends further highlight the decline at the secondary stage.



<sup>12</sup> Unified District Information System for Education Plus, <https://udiseplus.gov.in/#/en/home>

<sup>13</sup> NER is the total number of pupils enrolled in a particular level of school education who are of the corresponding official age group expressed as a percentage of the population of the official age-group which corresponds to the given level of school education in a given school year.

11.14. India has made notable gains in school enrolment by strengthening infrastructure and teacher capacity, with schemes like Poshan Shakti Nirman and Samagra Shiksha Abhiyan promoting access and equity. Further action is required, especially as the focus shifts from enrolment to learning outcomes. Policy interventions to expand composite and integrated schools, upgrading schools up to Class XII, and strengthening open schooling are vital for improving retention and optimising resources. Improving infrastructure, teacher skills through strengthened DIETs (District Institute of Education & Training), and SCERTs (State Council of Educational Research and Training), and involving parents and communities in governance can create an inclusive, learner-focused environment. Combining these strategies with curriculum and assessment reforms aligned with NEP and the use of digital platforms such as PM e-Vidya can provide high-quality, equitable education, even in remote areas. **Box XI.1** highlights how community participation improves educational outcomes.

### Box XI.1: Empowering change in Indian education through community participation

Education occurs not only in schools, but also within families, communities, and society as a whole, and evidence shows that community-school partnerships boost accountability<sup>14</sup>,<sup>15</sup>, enrolment, and children's FLN.<sup>16</sup> Parental involvement in education encourages children to work harder and achieve greater academic success.<sup>17</sup>

Community mobilisation for enhancing enrolment and learning outcomes is not new in India and has been part of the education landscape for decades. Campaigns such as 'Chaduvula Panduga' in Andhra Pradesh (launched during 1999–2002) and 'Alokar Jatra' in Assam (launched in 2002) illustrate how large-scale community mobilisation can improve access and enrolment and create local databases on children's educational status.<sup>18</sup> The 'Aao School Chalein' initiative in Haryana addresses student enrolment challenges through a micro-improvement approach and collaboration. Empowering school leaders, leveraging technology, and engaging stakeholders promote community participation to increase enrolment.<sup>19</sup>

14 Hevia, Felipe & Vergara-Lope, Samana. (2019). Educational Accountability or Social Accountability in Education? Similarities, Tensions, and Differences: Accountability Working Paper: Educational Accountability or Social Accountability in Education? Similarities, Tensions, and Differences. 10.13140/RG.2.2.18090.16326.

15 Lant Pritchett, Amanda Beatty, Slow down, you're going too fast: Matching curricula to student skill levels, International Journal of Educational Development, Volume 40, 2015, Pages 276-288, ISSN 0738-0593, <https://doi.org/10.1016/j.ijedudev.2014.11.013>

16 Kumar D, Sunder N, Ricardo, Wadhwa W, Improving children's foundational learning through community-school participation: Experimental evidence from rural India, Labour Economics, Volume 91, 2024, 102615, ISSN 0927-5371, <https://doi.org/10.1016/j.labeco.2024.102615>.

17 Epstein, J. L. (1995). School-Family-Community Partnerships: Caring for the children we share. Phi Delta Kappan, 76, 701-712. <https://tinyurl.com/nhjsmw3e>

18 Ministry of Education. Concept note on community participation: <https://tinyurl.com/mt2amy93>

19 OECD. Boosting School Enrolment Through Micro-Improvements: <https://tinyurl.com/3e8x4j3z>

Another example is the Zilla Parishad School Jalindarnagar, a public primary school in Taluka Khed, Maharashtra, which has pioneered a peer-learning 'Subject Friend' model in response to teacher shortages. The method requires grouping mixed-age students under older students for support in lessons and homework, thereby strengthening comprehension, confidence, and participation. This student-led approach has fostered inclusive, collaborative classrooms, expanded learning to advanced subjects such as coding, robotics, electronics, and multilingual education, increased enrolment to 120 students, and catalysed strong community engagement, with parents and local experts volunteering to teach vocational and academic skills and to co-maintain school infrastructure, leading as a model for wider replication.<sup>20</sup> The school's innovative intervention has received global recognition, with the institution being named the World's Best School in 2025 for the Community Choice Award by the T4 Education platform.<sup>21</sup>

Community engagement serves purposes beyond accountability. Teacher communities provide crucial peer support, boost motivation, and facilitate the implementation of policy initiatives at the ground level. Teachers in isolated Zilla Parishad schools often feel disconnected and demotivated due to the limited opportunities for recognition. This highlights the importance of building motivated teacher communities by leveraging technology and behavioural insights, creating platforms for peer learning and practice-sharing, and institutionalising recognition of teachers through appreciation at block- and district-level meetings.<sup>22</sup>

Community-based learning offers students real-world, practical experiences outside traditional schools. This method helps students link their academic knowledge with community needs, promoting a deeper understanding and greater engagement. Additionally, it fosters empathy, social responsibility, and leadership skills by exposing students to a variety of community issues.

## Improvement in learning outcomes

11.15. In the evolving landscape of education, learning assessments are vital for evaluating the education systems by identifying gaps and for setting priorities for improvement and innovation. Since 2001, National Achievement Surveys (NAS) conducted by the National Council of Educational Research and Training (NCERT) have provided valuable insights into the school education system. Building on this and with a focus on competency-based learning, PARAKH (Performance Assessment, Review, and Analysis of Knowledge for Holistic Development) Rashtriya Sarvekshan 2024 was

<sup>20</sup> <https://t4.education/5-prizes-finalists-winners/zp-school-jalindarnagar/>

<sup>21</sup> T4 Education is a global platform bringing together a community of over 200,000 teachers from more than 100 countries to transform education.

<sup>22</sup> NGOs, like the Open Links Foundation, have been working with the district administration on building such teacher communities (<https://www.openlinksfoundation.org/>)

launched.<sup>23</sup> Its main objective is to evaluate students' learning outcomes, competency, and holistic progress across key grades and provide a guide for policy, curriculum, and resource planning.

11.16. The PARAKH 2024 findings inform that Grade III results show promising recovery post-COVID. Girls slightly outperformed boys in Language (65 per cent vs. 63 per cent), while both scored equally in Mathematics (60 per cent). Rural students outperformed their urban peers, and state government schools led the way in foundational outcomes, validating the impact of NIPUN Bharat. Compared to NAS 2021 and 2017, Grade III proficiency levels have rebounded significantly, with 65 per cent of students proficient in Mathematics (up from 42 per cent in 2021) and 57 per cent in Language (up from 39 per cent).

11.17. To translate these assessment insights into sustained learning improvements, the rollout of Vidya Samiksha Kendras across all states/UTs will play a key role in standardising administrative practices and regulations, enabling real-time, data-driven monitoring of every child's learning outcomes, thereby supporting timely interventions. While the PARAKH Rashtriya Sarvekshan has strengthened learning assessment in India, going forward, it is essential to move beyond aggregate scores to identify underlying learning gaps and areas of conceptual confusion among students. This calls for further strengthening of the assessment system and strategy, so that assessment results effectively support improvements in learning outcomes through enhanced teacher capacity and pedagogy, as discussed in Box XI.2.

#### **Box XI.2: Reimagining school education: Strengthening meaningful assessments and enhancing accountability**

The present education policy landscape is being shaped by two complementary imperatives: deepening educational quality and reducing regulatory frictions that constrain innovation and choice. The next phase of educational transformation necessitates a shift toward enhanced accountability, learning measurement, and diversified, participatory delivery models. The demographic dividend can only be fully realised if learning outcomes improve across socioeconomic groups. There is an opportunity to institutionalise systemic assessments, evaluation, benchmarking and widened stakeholder participation to improve the quality of education.

<sup>23</sup> The PARAKH Rashtriya Sarvekshan 2024 (formerly National Achievement Survey) was undertaken by the National Assessment Centre, PARAKH, NCERT under the aegis of the Department of School Education & Literacy, Ministry of Education to understand the baseline performance under the NEP in development of competencies among students at the end of the Foundational, Preparatory, and Middle stages (Grades 3, 6, and 9 respectively) of schooling. Nationwide, over 21.15 lakh students, 2.70 lakh teachers, and school leaders from more than 74,000 schools across 781 districts from all States/UTs participated in the assessment. <https://dashboard.parakh.ncert.gov.in/en>

### Institutionalised systemic assessments

Large-scale assessments such as the NAS 2021 show that schools predominantly rely on internal and board examinations that assess content recall rather than generate diagnostic insights.<sup>24</sup> Annual Status of Education Report 2024 (ASER) findings highlight gains in learning outcomes but also point towards learning gaps variation across states, school types and rural-urban contexts. Box XI.3 discusses the findings and policy lessons from ASER.<sup>25</sup> The ASER and NAS findings suggest a deeper structural issue: school-based assessments are primarily designed for certification and promotion, and are not able to generate diagnostic evidence necessary to identify learning gaps and inform corrective action.

International experiences in large-scale assessments indicate that they are broader in scope. The National Assessment of Educational Progress in the US is conducted every two years by the National Centre for Education Statistics and the Institute of Education Sciences.<sup>26</sup> It provides broad results and specialists' analysis of student responses in reading and math, highlighting common wrong choices that reveal underlying confusion and how these patterns vary by grade or state. The findings help update learning standards, teaching materials, and professional development, and serve as feedback for practitioners to identify where students struggle and which concepts require more focus. The National Assessment Programme - Literacy and Numeracy in Australia follows a similar approach. Schools receive detailed analyses allowing teachers to act on the evidence directly. The common factor is that assessment data is treated as a tool for course-correction instead of remaining a scoreboard.

In the Indian context, it would be worthwhile to use assessment data to unpack the reasons behind the scores, understand errors, and underlying confusions, thereby converting the survey into a robust feedback tool for the stakeholders. Further, a complementary initiative could be the introduction of a PISA-like assessment at the end of Grade X.<sup>27</sup> A standardised competency-based assessment that compares states, school types, and socioeconomic cohorts on a common scale could provide policymakers with insights for targeted policy interventions.

### Independent evaluation and system-wide benchmarking

Relying solely on internal compliance and self-reporting of schools could be inadequate; achieving effective accountability requires independent oversight, transparent evaluation, and external involvement review.<sup>28</sup> International experience supports independent evaluation as both credible and non-intrusive. The Knowledge and Human Development

<sup>24</sup> NAS 2021-22 report: [download-national-report](#)

<sup>25</sup> The ASER is a nationwide citizen-led household survey that provides a snapshot of children's schooling and learning in rural India. <https://asercentre.org/asere-2024/>

<sup>26</sup> <https://nces.ed.gov/nationsreportcard/>

<sup>27</sup> PISA is the OECD's Programme for International Student Assessment. PISA measures 15-year-olds' ability to use their reading, mathematics and science knowledge and skills to meet real-life challenges. <https://tinyurl.com/ytuxmd2w>

<sup>28</sup> UNESCO. (2017). Accountability in education: Meeting our commitments <https://tinyurl.com/p8e37jf5>

Authority in Dubai utilises a tested template: schools are inspected by third-party agencies. To ensure consistent benchmarking and improvement, each school is assessed by the same agency for several years. Inspections cover learning outcomes, pedagogy, governance, inclusion, and wellbeing, with reports shared with the regulator and schools. These reports are often made public, influencing parental choice, driving school competition, and improving overall quality gains.<sup>29</sup>

In the Indian context, the National Institutional Ranking Framework (NIRF) ranking improves competition among higher education institutions and helps parents and aspirants make informed choices through a common benchmark. It enables comparison between public and private institutions, encouraging better governance. Applying similar benchmarking at schools could offer related benefits. India can also require sharing summary findings of such assessments with schools and regulators, creating a feedback loop for quality enhancement.

NITI Aayog's School Education Quality Index 2019 highlights the wide disparities in governance and learning outcomes across states, noting that without independently verified monitoring, accountability, and comparability remain weak.<sup>30</sup>

In this context, a regulated model of external evaluation of schools through accredited third-party agencies can address the accountability gap without adding bureaucratic burden. Empanelling independent agencies and requiring each school to partner with them for a minimum two to three-year period would allow for credible benchmarking, continuity in assessment and longitudinal tracking to support meaningful school improvement. Where benchmarking diversity is desirable, schools may voluntarily engage a second agency in parallel. A pilot programme in schools affiliated with the CBSE could be considered to develop a benchmarking system. Based on the template developed, states may be encouraged to use it with required adaptations, with the voluntary participation of private schools. Such benchmarking would form a basis for improved comparability between public and private schools, also.

11.18. The PARAKH survey goes beyond scores. It reveals that only 35 per cent of schools accommodate children with special needs (CWSN), and just 38 per cent have trained teachers. Emotional well-being indicators are similarly concerning: only 55 per cent of students feel motivated to attend school, and less than half feel emotionally safe. These insights underscore the need for the urgent integration of Social-Emotional Learning (SEL), peer support systems, and robust child protection policies. The Economic Survey 2024-25 (Chapter 11) carried a detailed discussion of various initiatives that promote SEL, life skills, and peer-based learning at the school level.<sup>31</sup> Building on these system-level findings, Box XI.3 discusses how learning outcomes are shaped by factors such as age of entry into schools, targeted remediation, digital access, and even parents' educational levels.

<sup>29</sup> KHDA report 2023-24: kf2024.eng.2

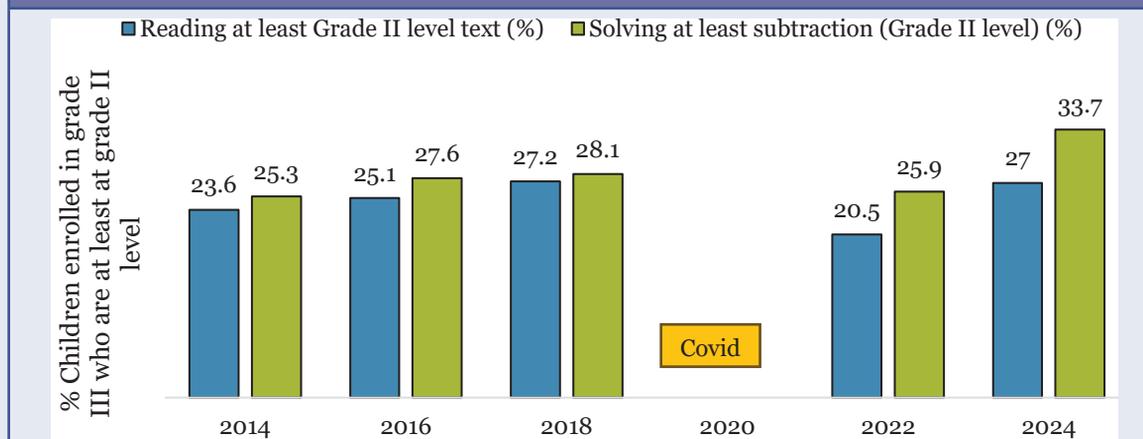
<sup>30</sup> NITI Aayog's School Education Quality Index (SEQI) 2019: <https://tinyurl.com/3uy22j84>

<sup>31</sup> Economic Survey 2024-25. Chapter 11 Social sector: extending reach and driving empowerment: <https://tinyurl.com/pz9tavzj>

### Box XI.3: From books to report cards: Evidence from learning surveys

A key focus of the NEP is to ensure that all students achieve FLN, with the goal that every student will reach this level by the end of Grade III. The PARAKH findings highlight the improvement in learning outcomes post-pandemic at the foundational stage. These findings are complemented by the ASER 2024.<sup>32</sup> Two structural factors that are shaping these learning gains are parental education and the age of entry into school.

**Chart XI.3: Improvement in learning outcomes  
(All India (Rural) ASER 2014-2024)**



Source: ASER 2014-2024

According to ASER 2024, the proportion of educated mothers has increased significantly. Evidence suggests that mothers' education has a significant impact on children's academic performance.<sup>33</sup> In 2014, 43 per cent of mothers with children aged 3-8 had no schooling, but by 2024, this figure decreased to 24 per cent. These mothers are a significant demand driver for education and improved facilities for their children, as evidenced by the increase in Anganwadi enrolment (for 3-year-olds). To capitalise on this trend, policies should include community programmes such as adult literacy classes and structured guidelines to build mothers' skills and empower them through health information. Complementary measures should support women's employment and girls' education, while providing simple weekly home-learning activities that enable parents to better support and monitor their children's foundational learning.

ASER 2024 highlights that the age of school entry and age mix in early grades also affect learning outcomes. Children aged eight and above in grade II perform better than their younger peers, indicating that timely school entry and developmental readiness are crucial. The share of underage children (five or below) in Grade I has dropped from 25.6 per cent in 2018 to 16.7 per cent in 2024, reflecting progress in aligning entry age with policy norms. However, improvements are still needed for children to consistently meet grade-level expectations.

<sup>32</sup> ASER 2024: <https://tinyurl.com/2hbb747t>

<sup>33</sup> Banerji, Rukmini, James Berry, and Marc Shotland. 2017. The Impact of Maternal Literacy and Participation Programmes: Evidence from a Randomized Evaluation in India. *American Economic Journal: Applied Economics*, 9 (4): 303-37. <https://tinyurl.com/55jb8uhk>

To address these challenges, Pratham’s Teaching at the Right Level (TaRL) approach groups children by learning levels, across or within grades, and uses simple, fun, creative, and engaging daily activities. Regular, time-bound assessments are carried out and recorded to monitor progress. Based on these assessments, children are re-grouped as they improve.

ASER 2024 also notes progress and challenges in rural India’s digital landscape. Digital devices have become widespread among rural youth aged 14-16, with 89.1 per cent having smartphone access at home. Among those youth who can use a smartphone, over half reported using digital platforms for education, and around 75 per cent use them for social media. This presents an opportunity to enhance learning through digital tools.

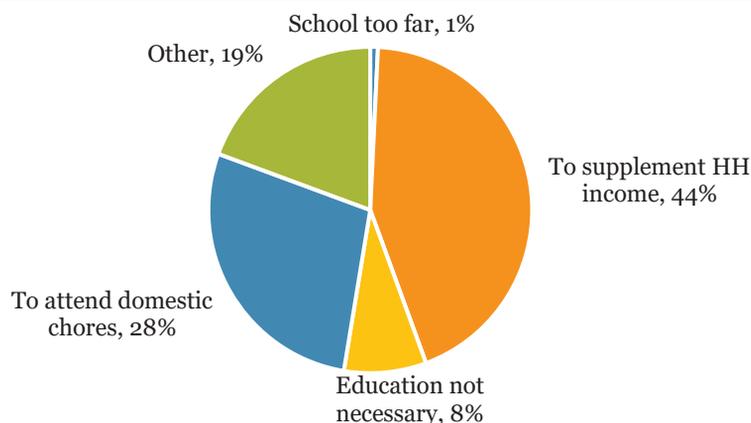
By adopting inclusive policies to enhance digital infrastructure and promote responsible digital literacy, India can equip its next generation with the skills needed to navigate a more connected world. NEP envisions integrating digital technologies across education by expanding affordable digital infrastructure and devices to bridge the digital divide and enable effective use of digital platforms for teaching and learning. Building on this, policy now needs to focus on a delivery mechanism that utilises AI and technology to support teachers, ease workloads, enhance the teaching learning process, align education with labour market needs, and create a seamless pipeline from education to employment.

## School-to-skill pathways

11.19. The education system plays a critical role in equipping young people for life after school. For children who are out-of-school or are at risk of dropping out, skill-based education is a vital intervention that helps them acquire practical skills and improve their job prospects.

11.20. Most out-of-school children in India are aged 14-18, the typical secondary education age. According to PLFS 2023–24, nearly two crore adolescents aged 14–18 years are out-of-school. The single largest reason for adolescent drop-out is the need to supplement household income, accounting for 44 per cent of drop-outs, particularly among boys (67.32 per cent). For girls, domestic and care responsibilities remain a major constraint, affecting over 55 per cent of those who leave school.

**Chart XI.4: Reason for not attending school for out-of-school adolescents (Age 14-18 years)**



Source: Unit-level data of PLFS 2023-24; HH: Household

11.21. One of the main reasons adolescents do not attend school is to supplement their household income. High dropout rates, driven by economic pressures, make integrating school-based vocational and skills education an urgent priority. Embedding structured skilling pathways in secondary schools can make education more relevant, provide early exposure to employable competencies, and transform schools into hubs of lifelong learning. The PLFS 2023-24 highlights the limited coverage of training, with only 0.97 per cent of 14-18-year-olds having received institutional skilling while nearly 92 per cent have none. Addressing this gap is crucial for leveraging India's demographic dividend. Skill education in schools would equip young people with market-aligned skills, particularly in the service sector, which absorbs over half of the formally trained youth, while reducing dropouts by linking education to economic opportunities. Strengthening the alignment between school education and national skilling priorities is therefore essential for reducing the share of out-of-school children and building a productive workforce (Box XI.4).

**Box XI.4: Strengthening school education for human capital and productivity growth**

The evolving skill needs of manufacturing, services, and the digital economy underscore the importance of continued schooling up to the higher secondary level. However, PLFS data reveal that a large majority of adolescents, 91.94 per cent, report no skilling exposure, while 7.09 per cent acquired skills informally, without certification or recognised employability pathways.

**Table XI.3: Status of skilling of population in the age group 14 to 18**

Received Skilling training (Population age 14 to 18)	Number (in lakh)	In per cent
Yes (from Formal institution)	11.33	0.97
Informal (hereditary, self-learning, learning on the job)	82.64	7.09
Not received	1072.25	91.94
<b>Total</b>	<b>1166.22</b>	<b>100</b>

Source: Annual PLFS 2023-24 (unit level data)

**Table XI.4: Field of formal training opted for by the population aged 14 to 18.**

Field of formal training	Number	per cent
IT-ITeS	5,99,714	52.94
Textiles and handlooms, apparel	1,28,202	11.32
Office and business-related work	97,942	8.65
Beauty and wellness	30,257	2.67
Electrical, power and electronics	29,264	2.58
Artisan and cottage-based production	20,567	1.82
Healthcare and life sciences	10,867	0.96
Other	2,16,021	19.06
<b>Total</b>	<b>11,32,834</b>	<b>100</b>

Source: Annual PLFS 2023-24 (unit level data)

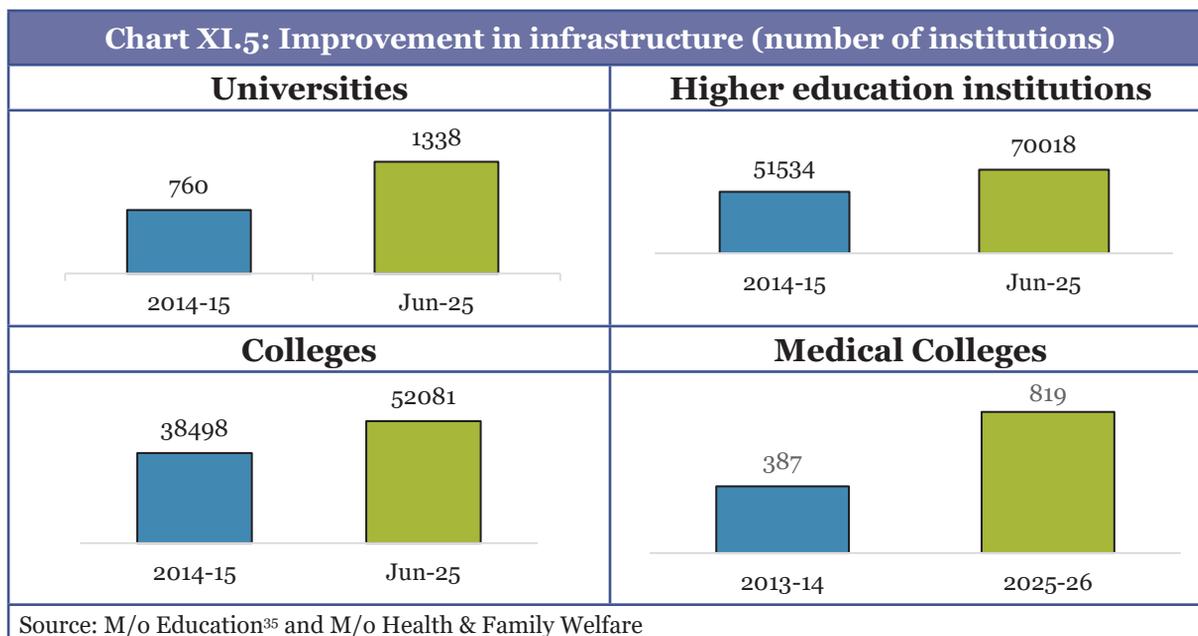
Among those trained formally, over 52.9 per cent are concentrated in IT/ITeS, pointing to strong demand for digital skills but also signalling limited access to formal training in other high-potential sectors. Training coverage remains very low in areas such as electrical and electronics, beauty and wellness, artisan and cottage-based trades, and healthcare and life sciences. This indicates a mismatch between the available training opportunities and the diverse labour market needs.

To harness the demographic dividend and build a workforce for a modern economy, a multipronged approach is needed. Composite schools could be established to ensure smooth transitions from pre-primary to higher secondary education. Vocational education integration from Grades VI-XII may include practical exposure and industry visits to enhance career awareness. Expanded partnerships with industry, Micro, small and medium enterprises (MSMEs), and Sector Skill Councils can promote workplace training and apprenticeships. Strengthening linkages between schooling, digital skills, and future-ready competencies can enhance labour productivity. The section on vocational education in Chapter 12 of the Economic Survey provides a detailed framework for enhancing vocational and technical education at the school level.

## Progress in higher education

11.22. The number of higher education institutions (HEIs) has increased from 51,534

in 2014-15 to 70,018 as of June 2025, significantly improving access. This increase is marked by substantial growth in universities and colleges. The number of premier HEIs has expanded significantly between 2014-15 and 2024-25, and now stands at 23 IITs (Indian Institute of Technology), 21 IIMs (Indian Institute of Management), and 20 AIIMS (All India Institute of Medical Sciences), alongside the establishment of two international IIT campuses in Zanzibar and Abu Dhabi.<sup>34</sup>



11.23. The All-India Survey on Higher Education (AISHE)<sup>36</sup>, 2022-23 (Provisional), reports an increase in student enrolment from 4.33 crore in 2021-22 to 4.46 crore in 2022-23. The GER for higher education at the national level is 29.5 in 2022-23, an improvement from 28.4 in 2021-22 and 27.1 in 2019-20.

11.24. Under the NEP, the higher education system has undergone several reforms. The National Credit Framework (NCrF), which aims to blend academic and skills-based learning, has been adopted by 170 universities. The Academic Bank of Credit covers 2,660 HEIs, with over 4.6 crore APAAR IDs<sup>37</sup> created, including 2.2 crore IDs with credits.<sup>38</sup> Flexible entry-exit pathways and biannual admissions have been introduced

<sup>34</sup> PIB release of the Ministry of Education dated 21 June 2025: <https://tinyurl.com/yc7km25d>

<sup>35</sup> Ibid note 34 above

<sup>36</sup> AISHE is a web-based survey conducted by the Ministry of Education since 2010-11. The survey covers all the Institutions in the country engaged in imparting of higher education. Data is being collected on several parameters such as teachers, student enrolment, programmes, examination results, education finance, and infrastructure. Institutions must register on the AISHE portal to be part of the national higher education database. As of 2022-23, 1213 Universities and 46624 colleges are registered on AISHE.

<sup>37</sup> The APAAR ID simplifies the processes of credit recognition and transfer right from the school level, thereby streamlining academic progression and recognition of prior learning.

<sup>38</sup> Academic Bank of Credits (Data as of 23 January 2026): <https://www.abc.gov.in/dashboard.php>

by 153 universities to achieve the NEP target of 50 per cent GER by 2035.<sup>39</sup> The NEP's target to build robust R&D capacity and nurture a research-driven culture across universities, colleges, and research institutions nationwide has been initiated with the establishment of the Anusandhan National Research Foundation.

11.25. Further, NEP's target to improve the quality of technical education is being addressed through the Multidisciplinary Education and Research Improvement in Technical Education (MERITE) Scheme for 275 technical institutions, including 175 engineering colleges and 100 polytechnics, which has been approved recently.<sup>40</sup>

11.26. The NEP envisions a 'light but tight' regulatory framework designed to uphold integrity, transparency, and efficient use of resources in the education system. The Viksit Bharat Shiksha Adhishthan Bill, 2025, introduced in the Lok Sabha on 15 December 2025, aims to fundamentally reform the higher education regulatory architecture, as outlined in NEP.<sup>41</sup> The proposed Viksit Bharat Shiksha Adhishthan (VBSA), as the apex body, would have three councils: (i) a Regulatory Council, (ii) an Accreditation Council, and (iii) a Standards Council for coordination and determination of standards in all HEIs under the Ministry of Education, University Grants Commission Act (UGC), the All India Council for Technical Education (AICTE), and the National Council for Teacher Education (NCTE). It will replace fragmented, overlapping regulations with a unified, technology-driven, single-window system, substantially reducing the compliance burden and delays. Transparent and student-centric systems proposed will improve access to quality HEIs, leading to higher GER. The Bill aims to facilitate the establishment of globally benchmarked institutions within the country, thereby retaining domestic talent and attracting international students and faculty. It will strengthen institutional autonomy, especially for Institutions of National Importance<sup>42</sup>, and enable more uniform standard-setting and coordinated growth of the higher education ecosystem.

### **Developing state capacity to strengthen higher education**

11.27. State Public Universities (SPUs) play a crucial role in expanding access to higher education and reducing regional disparities in educational opportunities. 495 SPUs in the country account for nearly 81 per cent of the total student enrolment in HEIs, i.e., about 3.24 crore students at present, with a decadal improvement (from 2011-12 to 2021-22) of 38 per cent.<sup>43</sup> Karnataka leads with 43 SPUs, followed by West Bengal and Uttar Pradesh, each with 38 SPUs. Given their scale and scope, improvements in

<sup>39</sup> PIB release dated 29 July 2025: <https://tinyurl.com/yhw6wxe2>

<sup>40</sup> PIB release of Ministry of Education dated 8 August 2025: <https://tinyurl.com/yy5redrj>

<sup>41</sup> The Bill has been referred to the Joint Standing Committee of Parliament. <https://tinyurl.com/ufe5zskd>

<sup>42</sup> The bill defines 'Institution of national importance' as an institution declared as such by an Act of Parliament.

<sup>43</sup> NITI Aayog (2025) Expanding Quality Higher Education through States and State Public Universities: <https://tinyurl.com/ywhj2z3v>

the quality of SPUs are crucial for India's vision of becoming a global hub of talent, knowledge, and innovation.

11.28. The Gender Parity Index (GPI) in SPUs stands at 0.93 nationally, with notable variation across regions.<sup>44</sup> Sikkim leads with a GPI of 1.78, indicating a higher proportion of female students in the SPUs. Goa and Haryana follow closely with GPIs of 1.75 and 1.33, respectively, surpassing the national average. Notably, the GPI in SPUs, though lower than the national average of GPI across HEIs, has shown a 31 per cent improvement over the past decade, indicating an increase in female enrolment in rural areas.

11.29. States have taken noteworthy initiatives to strengthen higher education. On governance, universities benefit from greater autonomy, simpler procedures, and more professional leadership structures, an approach reflected in Gujarat's Public Universities Act 2023. Capacity-building initiatives such as Maharashtra's State Faculty Development Academy help Vice Chancellors, registrars, and senior administrators build the skills needed to navigate emerging challenges and strengthen institutional management. Alumni engagement is deepened through structured approaches such as Odisha's Mo College initiative.<sup>45</sup> Models such as the Research Parks at IIT Madras and IISc (Indian Institute of Science) Bengaluru show how structured engagement with industry can deepen research quality and foster innovation. Odisha's Higher Education Programme for Excellence and Equity, which institutionalised research internships and Centres of Excellence, highlights how targeted interventions can expand student opportunities and industry connections.

11.30. A well-functioning innovation ecosystem depends on strong and continuous interaction between government, industry, and academia.<sup>46</sup> These linkages enable the creation, diffusion, and application of new knowledge, forming the basis for technological progress. Science, Technology, Engineering, and Mathematics (STEM) education provides the scientific and analytical skills needed for innovation. The full benefits appear only when research connects closely with industry to develop and commercialise new technologies. Strengthening these links is crucial for knowledge spillovers, faster technology adoption, and turning scientific progress into productivity gains. Box XI.5 discusses policy strategies to enhance industry-academia integration in STEM education.

---

<sup>44</sup> GPI is the ratio of female GER to male GER. The index indicates equality in access to education.

<sup>45</sup> Mo College Abhijan is a flagship initiative of the Government of Odisha, where alumni can volunteer to assist their colleges in improving. <https://rmddc.ac.in/home/mocollege>

<sup>46</sup> The interconnection and interaction between the three pillars namely, academia, industry, and government form the well-established Triple Helix Innovation Model (Etzkowitz and Leydesdorff, 2000). Etzkowitz, H., & Leydesdorff, L. (2000). The dynamics of innovation: From National Systems and Mode 2 to a Triple Helix of university-industry-government relations. *Research Policy*, 29(2), 109–123. <https://tinyurl.com/348vueaa>

### Box XI. 5. Industry-academia integration in STEM education

The NEP aims to integrate vocational training with general education and to encourage collaboration between industry and academia within HEIs. Industry-academia linkages in the higher education sphere have traditionally emphasised research collaborations, such as joint research, consulting, and technology transfer. However, this can be broadened to include teaching-oriented university-industry collaborations. These include co-creation and co-development of curricula, offering industry-led value-added courses, establishing labs with industrial tools, and upgrading faculty competencies. Teaching collaborations help reduce information gaps and strengthen graduates' domain-specific skills through hands-on learning and project-based engagement. It also promotes problem-solving, technological application, and product development, integrating the on-field industry insights from distinguished experts.<sup>47</sup>

Recent data shows a significant gap between industry requirements and the industry-ready institutes in India, with a recent TeamLease Edtech report showing that 75 per cent of HEIs lack industry-readiness. This is reflected in placement outcomes, with only 16.7 per cent of HEIs achieving 76-100 per cent placements within six months of graduation. Only 25 per cent of HEIs make use of live industry projects, while 26 per cent have internship integration.<sup>48</sup> Compounding these challenges, as of 31 January 2025, 56.2 per cent of professor posts remain vacant in Central Universities and other HEIs.<sup>49</sup>

Strengthening industry-academia collaboration offers a potential pathway to address these structural constraints and improve graduate employability. Recognising this, the government has undertaken several initiatives to deepen industry engagement in higher education. One such measure is the introduction of the 'Professor of Practice' (PoP) category at HEIs by the UGC and the AICTE.<sup>50,51</sup> The PoP concept allows industry professionals to bring real-world practices and experiences into the classroom and also augment faculty resources in HEIs. This enables institutions to formally engage eminent professionals to contribute to experiential learning, research, training, skilling, entrepreneurship, extension activities, and mentoring. According to the UGC PoP portal, over 18,000 experts have registered as PoP at 536 institutes.<sup>52</sup>

However, challenges remain, such as a lack of motivation among industry leaders to join academia due to short tenure (typically up to three years, extendable to four), the disqualification of retired academicians from applying as PoP, and rather strict eligibility criteria for appointment. These are areas which can be further reformed.

47 Borah, D., Malik, K., & Massini, S. (2021). Teaching-focused university–industry collaborations: Determinants and impact on graduates' employability competencies. *Research Policy*. <https://doi.org/10.1016/j.respol.2020.104172>

48 TeamLease. From degree factories to employability hubs (January 2026). <https://tinyurl.com/t7ss2m7b>

49 364th Report on Demands for Grants 2025-26 of the Department of Higher Education: <https://tinyurl.com/y7k7dphf>

50 UGC guidelines for engaging PoP: <https://tinyurl.com/3neshbkw>

51 AICTE Concept of PoP: <https://tinyurl.com/4stnu8uf>

52 PoP portal (As of 23 January 2026): <https://pop.ugc.ac.in/>

Complementing this, the AICTE-Industry Fellowship Programme aims to bridge the gap between academia and industry through active faculty engagement. By immersing faculty members in cutting-edge industrial environments, the programme seeks to equip them with modern industry insights, fostering their ability to deliver industry-relevant education. This initiative will eventually improve students' employability and industry readiness. As a pilot project, the scheme will train 350 faculty members in the 2025-26 academic year, with plans to expand to 1,500 participants annually over 3–5 years.<sup>53</sup>

In addition, the Indian Science Technology and Engineering facilities Map (I-STEM) serves as a national web portal for sharing R&D facilities.<sup>54</sup> The portal connects researchers with resources by enabling them to access existing publicly funded facilities, promoting indigenous technology development, and facilitating collaboration. It also allows researchers to share details of their outcomes, including patents, publications, and technologies. As of 2025, approximately 53408 researchers are registered in the I-STEM portal, and more than 30144 instruments have been uploaded by over 3745 institutes across India.<sup>55</sup>

Together, these initiatives aim to strengthen the long-term sustainability of industry-academia linkages by enabling greater, more open, and more active participation by industry professionals.

11.31. Over the years, the NIRF ranking has expanded in scope, focusing more on qualitative variables and now influences funding, institutional support, and academic autonomy. It signals student and employer perceptions of quality. The NIRF 2025 data shows South India and Delhi have a concentration of top-ranked institutions, while northern and central states lag, with few in the top 100.<sup>56</sup> Maharashtra and Uttar Pradesh are represented, but other large states have minimal presence. Emerging institutions in northeastern states and UTs are gradually appearing.<sup>57</sup> The process promotes data governance in HEIs, aiding benchmarking and strategic planning, and informs national policy and sector analysis.

11.32. The competitive spirit enforced by the rankings has given rise to the need for increased accountability of HEIs to learners and employers. With the evolving modes of content delivery, traditional HEIs now compete with edtech platforms also. As the quality of content and delivery becomes the primary metric of performance, it also becomes the measure for performance-linked funding, shifting the traditional institution-centric funding to learner-centric support, where learners are directly

<sup>53</sup> AICTE-Industry Fellowship: <https://ifp.aicte.gov.in/>

<sup>54</sup> The I-STEM is a national portal that is the gateway for researchers to locate the specific facility(ies) they need for their R&D work and identify the one that is either located closest to them or available the soonest. PIB release of Ministry of Science & Technology dated 20 March 2025: <https://tinyurl.com/ywc49rza>

<sup>55</sup> As of 23 January 2026 <https://www.istem.gov.in/>

<sup>56</sup> Delhi (8), Karnataka (6), Kerala (4), Tamil Nadu (17), and Telangana (5) together comprise 40 per cent of the institutions in the top 100 in terms of overall ranking.

<sup>57</sup> NIRF ranking 2025: <https://tinyurl.com/2ppumx46>

funded and have the choice of content providers. These developments blur ownership, location, legacy reputation, etc., causing 'creative destruction' that is likely to restructure higher education soon.

## Internationalisation of Higher Education

11.33. NEP aims at 'Internationalisation' of higher education by making the Indian education system self-reliant and comparable to global standards and norms, enabling it to attract more students from abroad and reduce outbound student migration. UGC issued the Regulations on Academic Collaboration between Indian and Foreign Higher Educational Institutions, 2022, enabling Indian HEIs to offer twinning, joint, and dual degree programmes with reputed foreign universities. Further, 100 per cent foreign direct investment (FDI) is allowed in higher education. These efforts are reinforced by the UGC (Setting Up and Operation of Campuses of Foreign Higher Educational Institutions in India) Regulations, 2023, under which 15 foreign HEIs are expected to set up campuses in India.<sup>58</sup>

11.34. With state-of-the-art infrastructure and advanced academic standards set up through the Higher Education Funding Agency, the World-Class Institutions Scheme<sup>59</sup>, and global rankings reflect its aim to become a global higher education hub. Internationalisation extends beyond collaborations and exchanges to recruiting international faculty, enrolling foreign students, and fostering an overseas research partnerships ecosystem. Box XI.6 outlines policy measures to promote international student mobility.

### Box XI.6: Promoting international student mobility

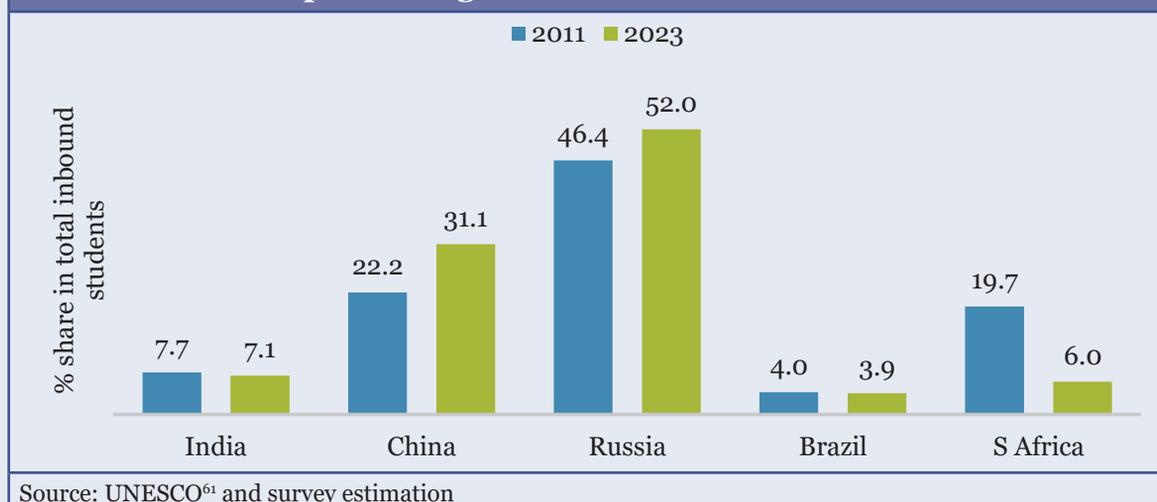
Globally, the stock of internationally mobile students has risen from about 22 lakh in 2001 to 69 lakh in 2022, with the USA, Canada, UK, Australia, France, and Germany as the principal hosts.<sup>60</sup> Within BRICS, Russia and China have emerged as major education hubs, together accounting for over four-fifths of inbound mobility into the bloc, while India's share remains in single digits despite its very large domestic higher education system.

<sup>58</sup> PIB of the Ministry of Education dated 26 May 2025: <https://tinyurl.com/35r74et5>

<sup>59</sup> The World Class Institutions Scheme was started in 2017 to enable HEIs in India to have affordable world-class academic and research facilities. Twelve institutions (eight public-funded and four private) have been notified as Institutions of Eminence (IoE) under the scheme. Policy on world-class institutions: <https://tinyurl.com/2bccrpyr>

<sup>60</sup> NITI Aayog. (2025). International student mobility: A global and Indian temporal overview <https://tinyurl.com/bde8mber>

Chart XI.6: Comparative figures of inbound students for BRICS nations



India has emerged as the world's largest source country of international students. The number of Indians studying overseas is rising from 6.85 lakh in 2016 to over 18 lakh by 2025. In 2024, for every one international student coming to India, 28 Indian students went abroad, with significant associated foreign exchange costs. Annual outward remittance under the 'studies abroad' component has increased to USD 3.4 billion in FY24. Indian students abroad are highly concentrated in a small group of host countries, including Canada, the USA, the UK, and Australia, whose attractiveness is driven by perceived quality, work rights, migration pathways, and strong branding.<sup>62</sup>

Inbound students in India increased from under 7,000 in 2000-01 to around 49,000 in 2020, just before the pandemic; however, this represents only about 0.10 per cent of total higher education enrolment, far below leading host countries where international students form 10-40 per cent of enrolments. State-wise, earlier hubs such as Karnataka and Tamil Nadu have seen declines in international student enrolment, while Punjab, Uttar Pradesh, Gujarat, and Andhra Pradesh have emerged as hosts, suggesting that sub-national policies, institutional capacity, and outreach significantly shape inflows.<sup>63</sup> Thirteen programmes account for over 1,000 foreign students each, led by the Bachelor of Technology, Bachelor of Business Administration, and Bachelor of Science, underscoring India's particular strength in cost-effective English-medium STEM and management education. India remains the principal host within South Asia, attracting over four-fifths of all inbound students to the sub-region in 2023, largely from neighbouring countries such as Nepal, Afghanistan, Bangladesh, and Bhutan. However, India's South Asian share has fallen by several percentage points since 2011, indicating rising competition from other regional and extra-regional destinations and signalling the need to refresh its regional value proposition.<sup>64</sup>

61 UNESCO dashboard: <https://databrowser.uis.unesco.org/>.

62 Ibid note 60 above

63 NITI Aayog (2025) 'Internationalisation of Higher Education in India: Prospects, Potential and Policy Recommendations' <https://tinyurl.com/ar2bz49p>

64 UNESCO: <https://databrowser.uis.unesco.org/>

Domestically limited international visibility of most institutions and regulatory frictions have limited India's ability to convert its cost and scale advantages into an equivalent pull factor.<sup>65</sup>

### Policy levers and education tourism

India's policy ecosystem for internationalisation has become more enabling, with the introduction of the NEP, updated UGC guidelines, regulations for academic collaboration and mutual recognition of qualifications, and permissions for foreign branch campuses, including those in GIFT City. The 'Study in India' initiative leverages quality benchmarks, including NAAC<sup>66</sup>, NIRF, IoE<sup>67</sup>, NBA<sup>68</sup>, and global rankings, to create a compelling proposition for international students. This directly advances an education-tourism strategy that capitalises on India's distinctive strengths: its rich traditions in philosophy, Ayurveda, classical arts, and spirituality, combined with affordability, widespread English proficiency, and a rapidly advancing innovation and digital ecosystem.

However, to position India as an education hub, broader strategies need to be deployed. Programme diversification beyond full degrees, such as summer schools, semester-abroad modules, heritage and philosophy tracks, yoga and Ayurveda certificates, and innovation or rural-immersion labs, can be bundled with tourism circuits and tailored for BRICS and wider Global South partners. Promoting reciprocal student mobility by establishing bilateral agreements, alongside encouraging top Indian HEIs to institutionalise two-way exchange programmes and offer joint, dual, or twinning degrees can be considered. Institutional and ecosystem reforms are necessary to enhance the campus experience (housing, health, counselling, insurance, and visa services). These reforms should simplify regulations (faster visas, post-study internships, recognition of prior learning, and flexible credits) and leverage alumni and start-up ecosystems through embassies and incubators, while building regional networks in STEAM<sup>3</sup> areas (STEM, including Arts, Management, and Medicine). Given the increasing visa and enrolment restrictions in the advanced countries, it is a timely opportunity for India to develop a tailored branding, communication, and outreach strategy to attract inbound students to India.<sup>69</sup>

The Indian Technical and Economic Cooperation Programme, of the Ministry of External Affairs, has trained more than two lakh persons from over 160 countries in both the civilian and the defence sector. It has been an important tool in strengthening India's cultural diplomacy and influence, especially in the South Asian region. Building an education ecosystem that provides international students, especially from the global south, with opportunities for education and research of global standards at affordable costs will lay the foundation for generational goodwill.

<sup>65</sup> Ibid note 60 above

<sup>66</sup> National Assessment & Accreditation Council

<sup>67</sup> Institute of Eminence

<sup>68</sup> National Board of Accreditation

<sup>69</sup> Ibid note 60 above

Internationalisation of education is the foundational step towards encouraging talent retention and migration into India. The competition from campuses of international universities can further incentivise Indian HEIs to advance standards and quality. Caution must be heeded to the working of market forces that might lead to a general increase in the cost of education, excessive commercialisation or exclusion of marginalised, as also to the risk of overemphasis on borrowed knowledge systems that may undermine indigenous/local traditions. The limitations of the existing regulatory framework may spill over, leading to more complexities in governance.

Building on existing initiatives, a measured focus on internationalisation can enhance the international mobility of students to India. Strengthening the quality, accessibility, and global alignment of India's higher education ecosystem would develop India as a global hub for education and research.

## HEALTH: STRENGTHENING PUBLIC AND PREVENTIVE HEALTHCARE

11.35. Complementing progress in education, enhancements in public health are equally important for strengthening human capital and economic productivity. India has made significant gains in healthcare over the last decade, improving life expectancy, reducing fertility rates, and decreasing maternal and child mortality rates through the implementation of effective strategies and policies. Since 1990, India has reduced its maternal mortality rate (MMR)<sup>70</sup> by 86 per cent, far exceeding the global average of 48 per cent.<sup>71</sup> Similarly, a 78 per cent decline in the under-five mortality rate (U5MR)<sup>72</sup> was achieved, surpassing the global reduction of 61 per cent and a 70 per cent decline in the neonatal mortality rate (NMR)<sup>73</sup> compared to 54 per cent globally during 1990-2023.<sup>74</sup>

11.36. The infant mortality rate (IMR)<sup>75</sup> marked a drop of more than 37 per cent over the past decade, declining from 40 deaths per thousand live births in 2013 to 25 in 2023.<sup>76</sup> Several states, including Karnataka, and Himachal Pradesh, have halved their IMRs over the past decade, marking substantial gains in health outcomes. Kerala, Manipur, Sikkim, and Goa have an IMR in the single digits, comparable to that of developed nations. This marks improvement in the state of neonatal and maternal care, as well as overall healthcare and socioeconomic conditions.

<sup>70</sup> Maternal mortality rate is defined as the number of maternal deaths during a given time period per 100,000 live births.

<sup>71</sup> United Nations Maternal Mortality Estimation Inter-Agency Group Report (2000-2023): <https://tinyurl.com/ty8v3mhr>

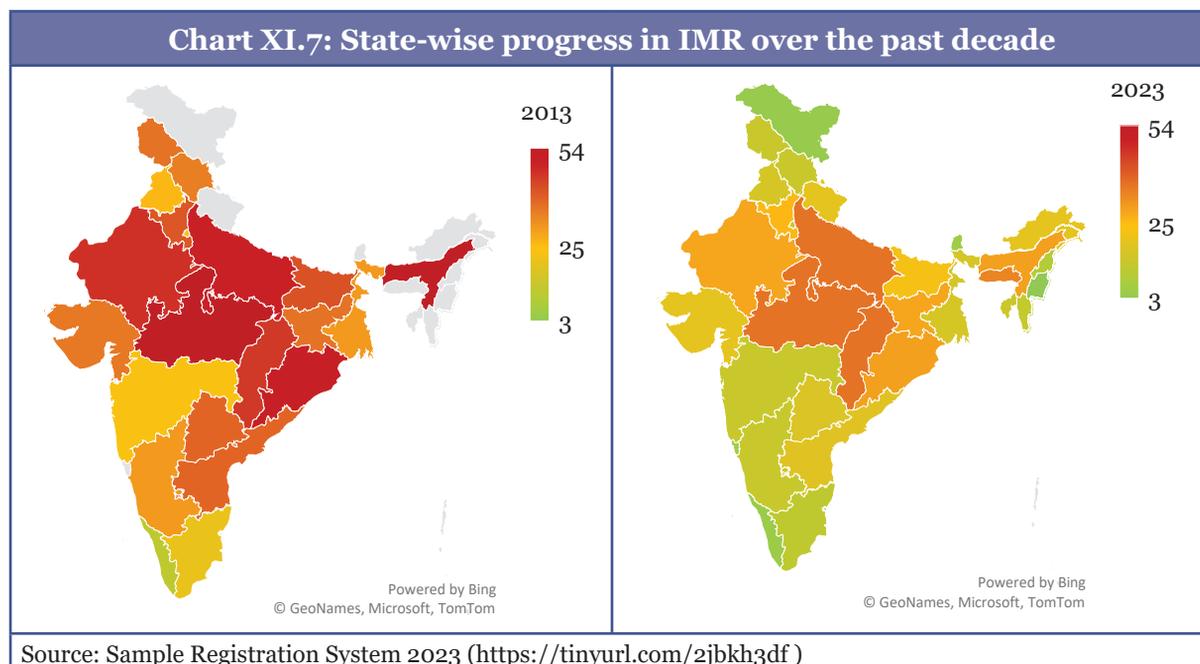
<sup>72</sup> U5MR refers to the probability a newborn would die before reaching exactly 5 years of age, expressed per 1,000 live births.

<sup>73</sup> NMR is defined as the number of deaths during the first 28 completed days of life per 1000 live births in a given year.

<sup>74</sup> UN Inter-Agency Group for Child Mortality Estimation (2024): <https://tinyurl.com/25pkr3tp>

<sup>75</sup> IMR is measured as the number of deaths among infants under one year of age per thousand live births.

<sup>76</sup> Sample registration system (2023): <https://tinyurl.com/2jbkh3df>



11.37. These improvements stem from concrete interventions: strengthened neonatal care protocols, expanded immunisation programmes, and the systematic establishment of neonatal intensive care units across government hospitals. Most infant deaths occur within the first month of life, making reductions during this period a significant achievement. While significant improvements have been made, moving forward, policy must focus on identifying region-specific barriers and targeted interventions to address disparities and continue reducing the national IMR.

11.38. India has harnessed digital technologies to build integrated healthcare and insurance systems that enhance transparency, minimise fragmentation, and expand access. A study of ICT interventions under the PM Jan Arogya Yojana scheme reported that the interventions have advanced the creation of a robust digital health ecosystem aligned with national performance goals.<sup>77</sup> The ICT innovations have meaningfully supported the achievement of universal health system reforms. Initiatives, such as the Hospital Management Information System, Ayushman Bharat Digital Mission (ABDM), and e-Sanjeevani, have enhanced citizen access to digital health services, created digital employment opportunities, along with enabling evidence-based policymaking and improved hospital management.

11.39. Centres of Excellence for AI-driven reform have been established at AIIMS Delhi, PGIMER Chandigarh, and AIIMS Rishikesh in partnership with the Wadhvani Institute. A Clinical Decision Support System integrated with e-Sanjeevani, a media disease surveillance tool, and AI-based diabetic retinopathy screening has been

<sup>77</sup> Achungura, G., Raza, A., Katre, V., Anand, J. S., Ravishankar, N., & Kelkar, R. (2024). Data Integration of Health Financing Systems as a Critical Enabler for Objective-Oriented Health System Reform: A Scoping Review from India. *Health Systems & Reform*, 10(3). <https://doi.org/10.1080/23288604.2024.2401190>

deployed<sup>78</sup>. Initiatives such as the Cough Against Tuberculosis (TB) screening test, tools to predict adverse outcomes in TB patients, mapping of villages more vulnerable to TB, and automation of line probe assays to detect drug-resistant TB are underway. These empower healthcare workers for early screening and surveillance, boosting accuracy, speed, efficiency, and access. Table XI.5 details the progress of various health sector schemes of the government.

**Table XI.5: Progress in health sector schemes**

<b>Ayushman Bharat<sup>79</sup></b>	<b>Human Resources<sup>80</sup></b>
<p>To holistically address health (covering prevention, promotion and ambulatory care), at primary, secondary and tertiary levels by adopting a continuum of care approach.</p> <ul style="list-style-type: none"> <li>➤ Ayushman Arogya Mandir (AAM) operational: 1,82,944</li> <li>➤ AAM rolled out with expanded range of services (excluding AAM-AYUSH): 1,51,116</li> <li>➤ Total footfall at AAM: 506.50 crores</li> <li>➤ Teleconsultations conducted: 42.66 crore</li> <li>➤ Wellness sessions conducted, including Yoga: 6.72 crore</li> </ul>	<p>Nearly 3.78 lakh health human resources provided to states</p> <ul style="list-style-type: none"> <li>➤ General Duty Medical Officer: 18,922</li> <li>➤ Specialists: 4,964</li> <li>➤ Staff Nurses: 77,874</li> <li>➤ ANMs: 96,720</li> <li>➤ Allied &amp; Health Care Workers (Paramedics): 93,034</li> <li>➤ Public Health Managers: 519</li> <li>➤ Lady Health Visitors: 2,701</li> <li>➤ Programme Management staff: 53,840</li> <li>➤ AYUSH doctors: 24,266</li> <li>➤ AYUSH Pharmacist: 3,416</li> <li>➤ AYUSH Paramedics: 2,275</li> </ul>
<p><b>Ayushman Bharat Pradhan Mantri Jan Aarogya Yojana (AB PM-JAY)<sup>81</sup></b></p> <ul style="list-style-type: none"> <li>➤ Ayushman Bharat cards generated: 42.78 crore</li> <li>➤ Hospital admissions: 10.98 crore</li> <li>➤ 49 per cent of beneficiaries are females</li> <li>➤ Senior citizens covered: 6 crore</li> </ul>	<p><b>National Programme for Prevention and Control of Non-Communicable Diseases (NP-NCD)<sup>82</sup></b></p> <p>Systematically identify high-risk individuals and link them to appropriate care.</p> <ul style="list-style-type: none"> <li>➤ Hypertension screenings: 40.13 crore</li> <li>➤ Diabetes screenings: 39.86 crore</li> <li>➤ Oral cancer screenings: 33.83 crore</li> <li>➤ Breast cancer screenings: 15.86 crore</li> </ul>

<sup>78</sup> Developed collaboratively by Central Tuberculosis Division, National Centre for Disease Control, CDAC-Mohali, ICMR, MeitY, Ministry of Higher Education, and Indian Institute of Science.

<sup>79</sup> Source: AAM portal, as of 31 December 2025.

<sup>80</sup> as per NHM MIS as on June 2025.

<sup>81</sup> As of 12 January 2026.

<sup>82</sup> As of 31 October 2025.

<p style="text-align: center;"><b>Ayushman Bharat Health Infrastructure Mission<sup>83</sup></b></p> <p>Strengthening health systems and institutions to ensure a continuum of care across all levels - primary, secondary, and tertiary.</p> <ul style="list-style-type: none"> <li>➤ Building-less Sub Centre-Health Wellness Centre: 9519</li> <li>➤ Urban-AAM: 5456</li> <li>➤ Block Public Health Unit: 2151</li> <li>➤ Integrated Public Health Labs: 744</li> <li>➤ Critical Care Blocks: 621</li> </ul>	<p style="text-align: center;"><b>National Tuberculosis Elimination Programme<sup>84</sup></b></p> <ul style="list-style-type: none"> <li>➤ Incidence rate declined by 21 per cent, from 237/lakh (2015) to 187/lakh (2024); double the global decline (12 per cent).</li> <li>➤ Mortality rate reduced by 25 per cent, from 28/lakh (2015) to 21/lakh (2024).</li> <li>➤ TB treatment coverage increased by 39 per cent, from 53 per cent (2015) to 92 per cent (2024); higher than the global average (78 per cent).</li> </ul>
<p style="text-align: center;"><b>Universal Immunisation Programme<sup>85</sup></b></p> <p>U-WIN portal is a user-friendly platform that enables seamless access to immunisation records, flexible scheduling, and 'Anytime Access' and 'Anywhere' vaccination</p> <ul style="list-style-type: none"> <li>➤ Total registered beneficiaries: 14.32 crore,</li> <li>➤ Deliveries recorded: 1.62 crore, and</li> <li>➤ Vaccination doses administered and recorded: 60.98 crore</li> </ul>	<p style="text-align: center;"><b>Pradhan Mantri National Dialysis Programme<sup>86</sup></b></p> <ul style="list-style-type: none"> <li>➤ Financial risk protection for the patients by preventing them from incurring the out-of-pocket expenditure of ₹9741.25 crores.</li> <li>➤ Dialysis was provided to 30.12 lakh patients (cumulative) and</li> <li>➤ Hemo-dialysis sessions held 389.65 Lakh</li> </ul>
<p style="text-align: center;"><b>Swasth Nari Sashakt Parivar Abhiyaan</b></p> <p>A nationwide campaign aimed at promoting inclusive healthcare and empowering women.</p> <ul style="list-style-type: none"> <li>➤ Over 1.51 crore beneficiaries were screened for anaemia in 19.28 lakh camps held between 17 September to 2 October 2025.</li> </ul>	

## India's epidemiological transition

11.40. India is in a critical and complex stage of the epidemiological transition<sup>87</sup>. While the classical model of transition describes a linear shift from infectious to non-communicable diseases (NCDs) (Omran A., 1971<sup>88</sup>), India's path is more nuanced and overlapping. Over the past few decades, the country has experienced a substantial

<sup>83</sup> MoHFW figures as of 12 November 2025.

<sup>84</sup> WHO's Global TB Report 2025.

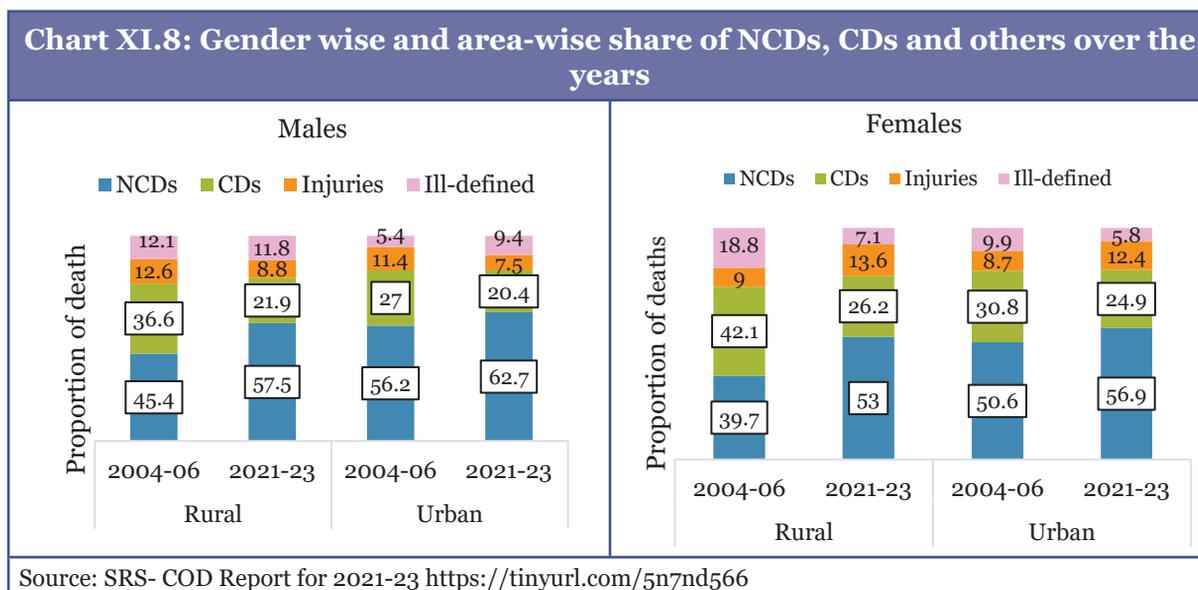
<sup>85</sup> UWIN data as of 31 December 2025.

<sup>86</sup> As on 30 November 2025.

<sup>87</sup> The demographic transition refers to the shift from high to low birth and death rates as societies modernise, while the epidemiological transition describes the change in leading causes of death from infectious diseases to chronic, non-communicable conditions.

<sup>88</sup> Omran A. The epidemiologic transition: A theory of the epidemiology of population change. *Milbank Mem Fund Q.* 1971; 49:509–38 <https://psycnet.apa.org/doi/10.2307/3349375>  
Omran's epidemiological transition theory describes three stages of societal development: an initial phase marked by high and volatile mortality from famine and epidemics; a transitional phase of declining infectious diseases and rising life expectancy; and a later phase dominated by degenerative and man-made diseases as mortality declines slowly.

decline in mortality from infectious diseases and an increase in life expectancy at birth from 49.7 years in 1973 to 70.3 years in 2023. However, it still faces a double burden: persistent communicable diseases (CDs) (e.g., tuberculosis, vector-borne infections) coexist with rapidly rising NCDs like cardiovascular diseases, diabetes, and cancers. Recent data show that NCDs account for more than 57 per cent of all deaths in the country.<sup>89</sup>



11.41. This duality of rising burdens of CDs and NCDs is compounded by regional and socioeconomic disparities. While Kerala exhibits health profiles similar to developed countries, dominated by degenerative diseases, certain other states still face issues of malnutrition and infectious disease outbreaks.

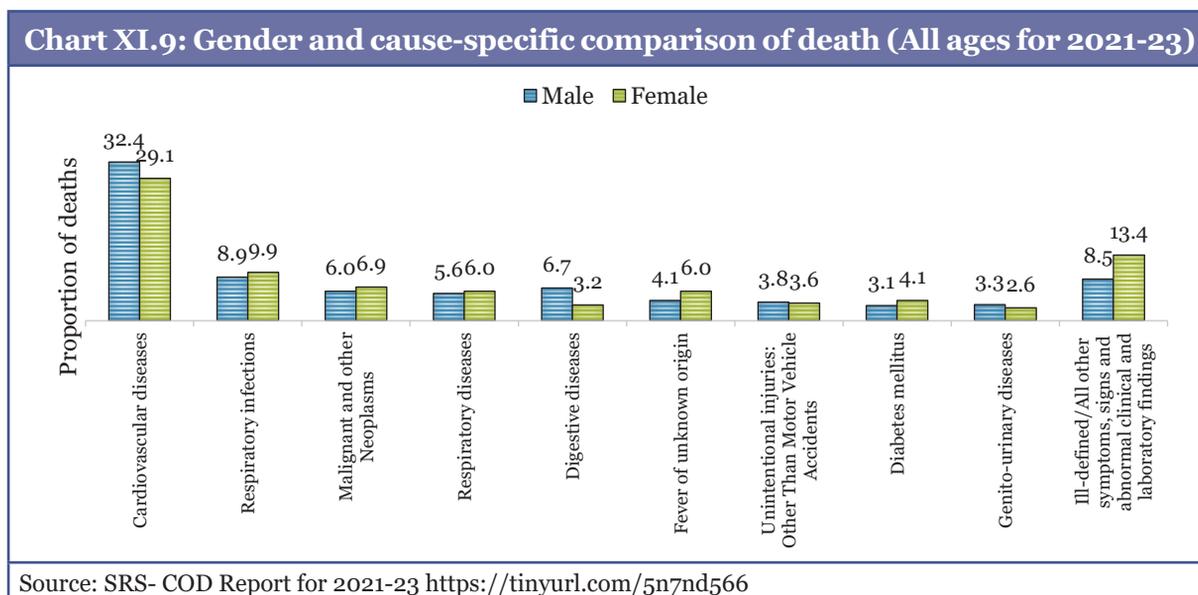
11.42. Cardiovascular diseases have been the leading cause of death for both men and women, with a higher proportion in males across all years since 2004-06.<sup>90</sup> Other major causes include perinatal conditions, diabetes, and genitourinary diseases. Men are found to have higher all-cause and cardiovascular mortality rates compared to women. This pattern has been documented across countries in global and regional studies.<sup>91</sup> However, women may have worse prognosis and higher case fatality rates after acute cardiovascular events, potentially due to delayed diagnosis or under-treatment<sup>92</sup>.

89 Source: Statement 2.1C of SRS- Cause of Death in India Reports <https://tinyurl.com/5n7nd566>

90 SRS- Cause of Death in India Reports over the years : <https://tinyurl.com/5n7nd566>

91 World Heart Federation. (2023). World Heart Report 2023: Confronting the world's number one killer. <https://tinyurl.com/3fjh785p>

92 Möller-Leimkühler, A. M. (2007). Gender differences in cardiovascular disease and comorbid depression. *Dialogues in Clinical Neuroscience*, 9(1), 71–83. <https://doi.org/10.31887/DCNS.2007.9.1/ammoller>



11.43. Consolidating gains in maternal and child health, while scaling up efforts for elderly and chronic disease care, will be critical to keep pace with its demographic realities. The dominance of cardiovascular diseases highlights the need for targeted prevention and management strategies, with special attention to gender-specific risk factors and healthcare access. The higher proportion of ill-defined<sup>93</sup> causes in women suggest a need for improved diagnostic accuracy and healthcare utilisation among females.

11.44. Obesity is rising at an alarming rate and is today a major public health challenge in India. Driven by unhealthy diets, lifestyle changes, including sedentary lifestyles, increased consumption of ultra-processed foods (UPFs), and environmental factors, it is affecting people across all age groups and increasing the risk of NCDs such as diabetes, heart disease, and hypertension, impacting both urban and rural populations. The next section discusses this issue.

### Tackling the obesity challenge

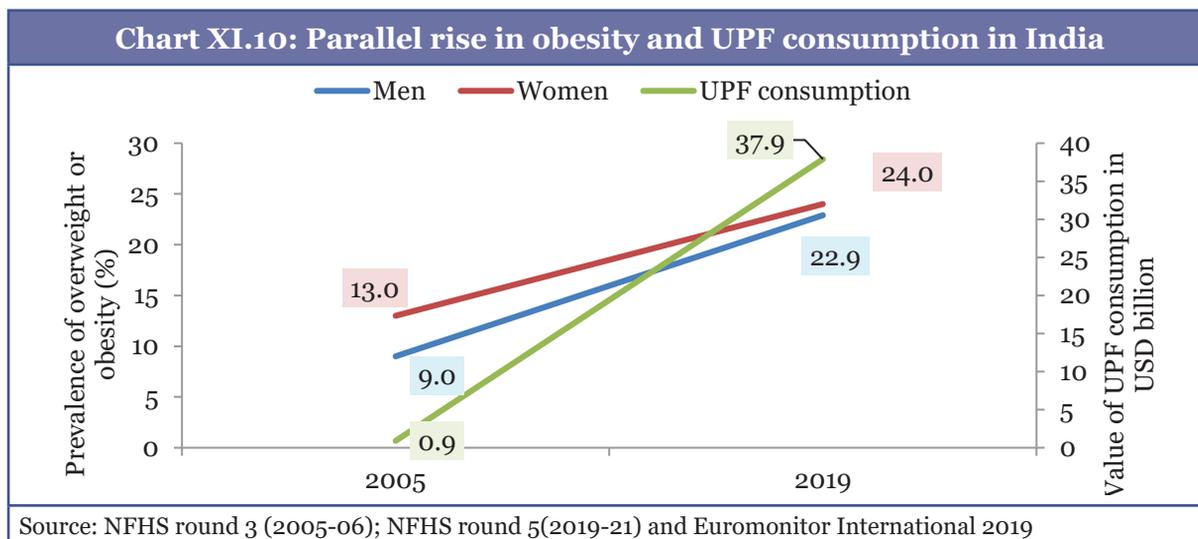
11.45. The 2019-21 National Family Health Survey (NFHS) reports that 24 per cent of Indian women and 23 per cent of Indian men are overweight or obese. Among women aged 15-49 years, 6.4 per cent are obese, and among men, 4.0 per cent are obese. More troubling still, the prevalence of excess weight among children under five has risen from 2.1 per cent in 2015-16 to 3.4 per cent in 2019-21. According to estimates, over 3.3 crore children in India were obese in 2020, and it is projected to reach 8.3 crore children by 2035.<sup>94</sup>

11.46. India is one of the fastest-growing markets for UPF sales. It grew by more than

<sup>93</sup> SRS defines ill-defined causes of death as instances where the cause could not be properly diagnosed.

<sup>94</sup> World Obesity Atlas 2024 (<https://tinyurl.com/2pwnvjf2>)

150 per cent from 2009 to 2023.<sup>95</sup> Retail sales of UPFs in India surged from USD 0.9 billion in 2006 to nearly USD 38 billion in 2019, a 40 fold rise.<sup>96</sup> It is during the same period that obesity has nearly doubled in both men and women. This mirrors the global rise of obesity, parallel to dietary shifts.<sup>97</sup>



11.47. UPFs are displacing long-established dietary patterns, worsening diet quality, and are associated with increased risk of multiple chronic diseases. A global team of researchers worked on the Lancet Series on UPFs and Human Health<sup>98</sup>, consolidating the global evidence demonstrating that high UPF consumption is associated with several adverse health outcomes, such as obesity, chronic heart disease risk, respiratory issues, diabetes, mental health disorders, etc. The rising use of UPFs imposes a substantial economic cost through higher healthcare spending, lost productivity, and long-term fiscal strain. Box XI.11 of the Economic Survey 2024-25, presented facts about the growth of UPF markets worldwide and in India, along with evidence of their impact on various health parameters, including mental health.<sup>99</sup> Box XI.7 takes the discussion forward and presents potential policy responses.

### Box XI.7: Addressing the challenge of ultra-processed foods

An increase in UPFs in the human diet is contributing to chronic diseases worldwide and widening health inequalities. There is a growing body of evidence on the impact of UPFs on human health, indicating that there should be no delay in implementing public health policies while further research continues to unfold.<sup>100</sup> Policies have so far focused on advocacy to reduce consumption of foods high in added fats, sugar, and sodium, many of which are UPFs. However, improving diets cannot depend solely on consumer behaviour change; it

95 [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(25\)01567-3/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(25)01567-3/fulltext)

96 [https://icrier.org/pdf/Ultra\\_Processed\\_Food.pdf](https://icrier.org/pdf/Ultra_Processed_Food.pdf)

97 <https://www.nature.com/articles/s41574-025-01143-7>

98 <https://www.thelancet.com/series-do/ultra-processed-food>

99 Economic Survey 2024-25 Chapter 11 Social Sector: <https://tinyurl.com/pz9tavzj>

100 Ultra-processed foods: time to put health before profit - The Lancet, Volume 406, Issue 10520, 2601

will require coordinated policies across food systems that regulate UPF production, promote healthier and more sustainable diets and marketing.

*The marketing challenge:* Marketing strategies for UPFs often include explicit encouragements for overconsumption, with phrasing such as ‘I bet you can't eat just one’.<sup>101</sup> While noodles utilise emotional selling or ‘buy one get one free’ tactics, as well as celebrity endorsements and projecting the UPF as a healthy food option. Such strategies lead to the displacement of whole foods and degrade the quality of the diet. Adolescents exposed to unhealthy food and beverage advertising showed a high desire and intention to consume the advertised foods.<sup>102</sup> A study from Punjab found that parents are concerned about food advertisements, especially during children's TV viewing time, and celebrity endorsements, which they believe may increase the frequency of children eating out.<sup>103</sup>

A study from New Zealand found that children's exposure to unhealthy food/drink marketing is linked to their dietary preferences and consumption.<sup>104</sup> A recent state-of-the-art review report of UNICEF finds strong evidence linking marketing and UPF intake.<sup>105</sup>

India's policy response to the rising burden of obesity, NCDs, and increasing UPF consumption was documented in 2017 through the National Multi-sectoral Action Plan (NMAP) for Control of Common NCDs. It called for reducing unhealthy diets, considered to be a key driver of NCDs, and for reducing high-fat, sugar and salt (HFSS) food consumption through several steps and coordinated action across 39 departments. These included regulations for Front-of-Pack labelling (FOPL), a ban on advertisements of HFSS foods by amending existing laws on the Advertising Code<sup>106</sup> and the Norms of Journalistic Conduct to explicitly include HFSS foods. It also envisaged a comprehensive law to prevent and control NCDs, addressing the marketing and advertising of HFSS and alcohol. The NMAP had set a target to halt obesity by 2025.

The ICMR–NIN Dietary Guidelines (2024) explicitly warn against UPFs and recommend limiting HFSS products. The Central Consumer Protection Authority (CCPA) Guidelines for Prevention of Misleading Advertisements (2022), and relevant provisions of the Food Safety and Standards Act 2006 commit that there shall be no misleading food advertisements.<sup>107</sup> However, enforcement against misleading food advertisements leaves much to be desired.

101 Friedman, N. The four-letter word that changed advertising history. <https://tinyurl.com/5n869wj2>

102 Tsochantaridou, A., Sergentanis, T. N., Grammatikopoulou, M. G., Merakou, K., Vassilakou, T., & Kornarou, E. (2023). Food Advertisement and Dietary Choices in Adolescents: An Overview of Recent Studies. *Children*, 10(3), 442. <https://doi.org/10.3390/children10030442>

103 Verma, M., Aggarwal, R., Nath, B. et al. Exploring the influence of food labels and advertisements on eating habits of children: a cross-sectional study from Punjab, India. *BMC Public Health* 23, 311 (2023). <https://doi.org/10.1186/s12889-023-15058-3>.

104 Frost H, Te Morenga L, Mackay S, McKerchar C, Egli V. Impact of unhealthy food/drink marketing exposure to children in New Zealand: a systematic narrative review. *Health Promot Int*. 2025 Mar 5;40(2):daaf021. doi: 10.1093/heapro/daaf021. PMID: 40177787; PMCID: PMC11965983. <https://tinyurl.com/bp5sct8j>

105 UNICEF. (2025). Ultra-processed foods and children: State-of-the-art review. UNICEF Knowledge. <https://tinyurl.com/mrykb6cm>

106 Cable Television Networks (Regulation) Act, 1995 & Advertising Code (Rule 7). (1994). Ministry of Information and Broadcasting, Government of India. <https://tinyurl.com/mry9phkf>

107 Food Safety and Standards Act. 2006. Ministry of Health and Family Welfare, Government of India. Retrieved from <https://www.fssai.gov.in>

While Rule 7 of the Advertisement Code prohibits misleading, unverified, or unhealthy advertisements, it does not define ‘misleading’ with measurable or nutrient-based criteria, leaving interpretation subjective and inconsistent. Similarly, the CCPA guidelines mandate that ads must not exaggerate health benefits or exploit children, yet they lack clear nutrient thresholds or a framework for identifying misleading claims in food marketing.<sup>108</sup> This regulatory ambiguity allows companies marketing UPFs to continue making vague ‘health,’ ‘energy,’ or ‘nutrition’ cues without violating any clearly defined standard, highlighting a critical policy gap that needs reform.

A comprehensive analysis of the policy framework around advertisements by public health experts in India concluded that a ‘robust regulatory framework is needed to protect children from HFSS food marketing, not just what is “directed” at them, with clear evidence-based food classification criteria.’<sup>109</sup>

The option of a marketing ban on UPFs from 0600 hours to 2300 hours for all media, and enforcing restrictions on the marketing of infant and toddler milk and beverages, could be explored. Chile is an example of a country with integrated laws. Advertisement restrictions are also done in other countries, such as Norway and the UK. Recently, the UK has banned junk food advertising before 9 pm on TV and online to reduce children’s exposure and curb childhood obesity.<sup>110</sup> Further action on other marketing activities, including school and college sponsorship of events by UPF manufacturers, can be designed. The authors recommended UPF marketing restrictions to be mandatory and include digital media.

*Front-of-pack nutrition labelling:* In a unique multi-sector consensus, 29 organisations issued a statement reviewing evidence on FOPL. It offers concrete recommendations, particularly for replacing the proposed Indian Nutrition Rating (or Health Star Rating) system with warning labels, restricting marketing to children, and ensuring that trade agreements do not undermine public health policy.

Studies have shown that warning labels are the most effective option for discouraging UPF consumption, compared with ranking-style labelling schemes such as Nutri-Score and Health Star Ratings.<sup>111,112,113</sup> The authors recommend that warning labels be added to UPFs or HFSS foods targeted at infants and toddlers, as these foods are currently not included in regulations. Prohibition of nutrient and health claims on UPFs is also recommended to avoid health halo effects.

108 CCPA. 2022. Guidelines for Prevention of Misleading Advertisements and Endorsements. Ministry of Consumer Affairs, Government of India. Retrieved from <https://consumeraffairs.nic.in>

109 Shalini Bassi et. al. 2024. Are advertising policies affirmative in restricting the marketing of foods high in fat, salt and sugar (HFSS) in India?: evidence from SWOT Analysis, *The Lancet Regional Health - Southeast Asia*, Volume 21, 2024, 2772-3682, <https://tinyurl.com/3d8vrj6v>

110 UK Government News: <https://tinyurl.com/m4h4erj8>

111 Barrett, E. M., & Pollard, C. M. (2025, January 11). Parents find Health Star Ratings confusing and unhelpful. <https://tinyurl.com/2j827kye>

112 Christina A. et.al. 2021. The Influence of Front-of-Package Nutrition Labelling on Consumer Behaviour and Product Reformulation. *Annual Review Nutrition*. 41:529-550. <https://doi.org/10.1146/annurev-nutr-111120-094932>.

113 Taillie, L. S., Hall, M. G., Popkin, B. M., Ng, S. W., & Murukutla, N. (2020). Experimental Studies of Front-of-Package Nutrient Warning Labels on Sugar-Sweetened Beverages and Ultra-Processed Foods: A Scoping Review. *Nutrients*, 12(2), 569. <https://doi.org/10.3390/nu12020569>

*Nutrient-Based Tax on UPFs:* The possibility of introducing the highest slab of GST and a surcharge on UPFs which exceed thresholds for sugar, salt, or fat could be explored. The revenue generated could be earmarked for public health initiatives, including nutrition education, school meal improvements, and NCD prevention programmes.

### **Multi-pronged approach**

It is essential to reiterate some key points made in the previous Economic Survey, namely that a multi-pronged approach is necessary to address the concerns arising from the increased inclusion of UPFs in diets in India.<sup>114</sup> The Food Safety and Standards Authority of India (FSSAI) may bring UPFs under regulation with a clear definition and standards, including stricter labelling requirements. UPF may be defined in addition to HFSS by integrating it into the existing frameworks, rather than replacing them. This can be done by using the Nova classification or by identifying cosmetic additives. Enhanced monitoring of branded products to ensure compliance would help build consumer confidence. It is also crucial to raise awareness about the adverse effects of consuming UPFs through targeted campaigns aimed at schools and colleges.

11.48. Recognising obesity as a critical public health concern, the government has launched comprehensive, multi-pronged initiatives to prevent, manage, and reduce obesity in the country. The interventions are strategically designed by multiple ministries to promote a holistic approach that integrates health, nutrition, physical activity, food safety, and lifestyle modifications (e.g., POSHAN Abhiyaan & Poshan 2.0, Fit India Movement, Khelo India, Eat Right India, Nationwide Awareness Campaign – ‘Aaj Se Thoda Kam’) and AAMs, the School Health Programme, and Yoga promotion continue to advance the goal of a healthier, stronger, and obesity-free India. Ministry of Health & Family Welfare (MoHFW) has issued instructions to all states/UTs to take action for a 10 per cent reduction in oil consumption and intensify awareness through National Programme for Prevention and Control of NCDs (NP- NCD) platforms. Under the programme, over 31.5 crore adults have been screened, and 8.47 crore identified as overweight or obese. The FSSAI has launched the ‘Stop Obesity & Fight Obesity-Awareness Initiative to Stop Obesity’ campaign to prevent obesity and reduce excessive oil consumption. As part of the campaign, communication materials to raise awareness of obesity have been prepared in regional languages and sign language, alongside media outreach through FM radio, railway announcements, and digital platforms.<sup>115</sup> Above all, it is important for all to focus on the intake of the right nutrition in their diets. The following section discusses the need to narrow the nutritional gap while presenting the extent of the challenge in this regard.

### **Nutritional intake trends**

11.49. The nutrition landscape is one of complexities characterised by the incidence of child malnutrition; key nutrient deficiencies in adolescent girls, pregnant and lactating

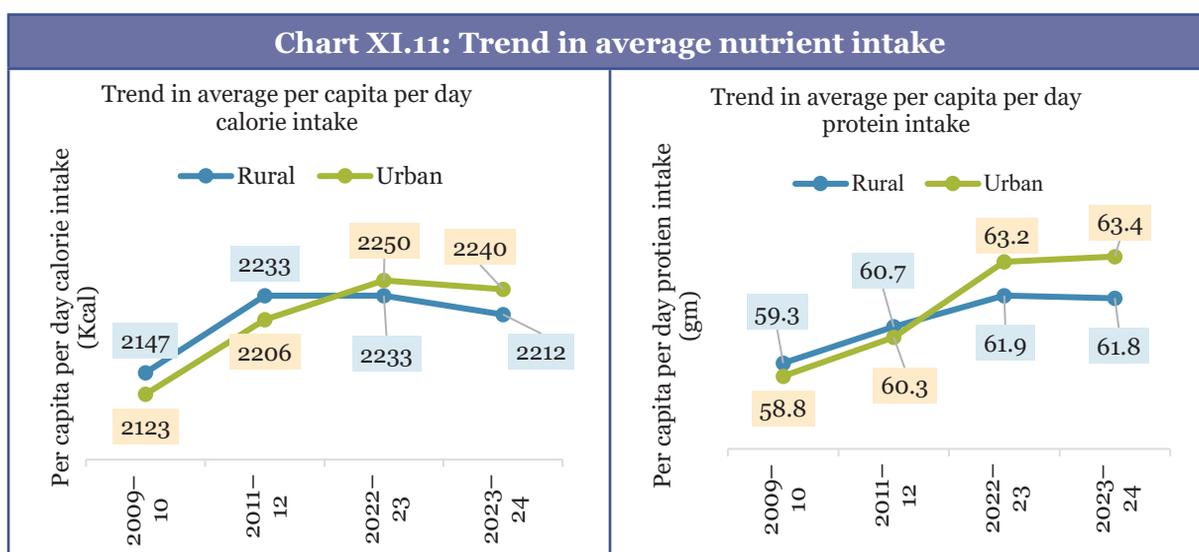
<sup>114</sup> Ibid note 99 above

<sup>115</sup> Press release of the MoHFW 7 June 2025: <https://tinyurl.com/3nr5v5nx>

mothers, and micronutrient and mineral deficiencies, especially the vulnerable and marginalised sections of society. The concerns of rising lifestyle diseases, rising burden of cancers, increasing antibiotic resistance, and falling general immunity levels are exacerbated as a consequence of nutritional deficiencies. It is evident that nutrition plays a crucial role in addressing many of these concerns.

11.50. Nutritional intake trends set the broader context of India’s progress and commitment to achieving SDG 2: Zero Hunger, which focuses on eliminating hunger and improving nutrition outcomes. Daily per capita intake of calories and protein has increased in both rural and urban areas between 2009-10 and 2023-24 (Chart XI.11).<sup>116</sup> Calorie intakes for rural and urban populations are similar at nearly every income level, suggesting a narrowing nutritional gap (Chart XI.12). Additionally, a positive correlation has been observed between consumption expenditure and calorie intake in both rural and urban India.<sup>117</sup>

11.51. The National Food Security Act of 2013 (NFSA) is one of the largest food security programmes globally, aiming to ensure access to food for all. Moving beyond food security and to ensure nutrition security, targeted initiatives such as Saksham Anganwadi and POSHAN 2.0, Pradhan Mantri Matru Vandana Yojana (PMMVY) and Poshan Shakti Nirman are being implemented with a focus on improving the nutritional status of adolescent girls, pregnant and lactating mothers, and school-going children.

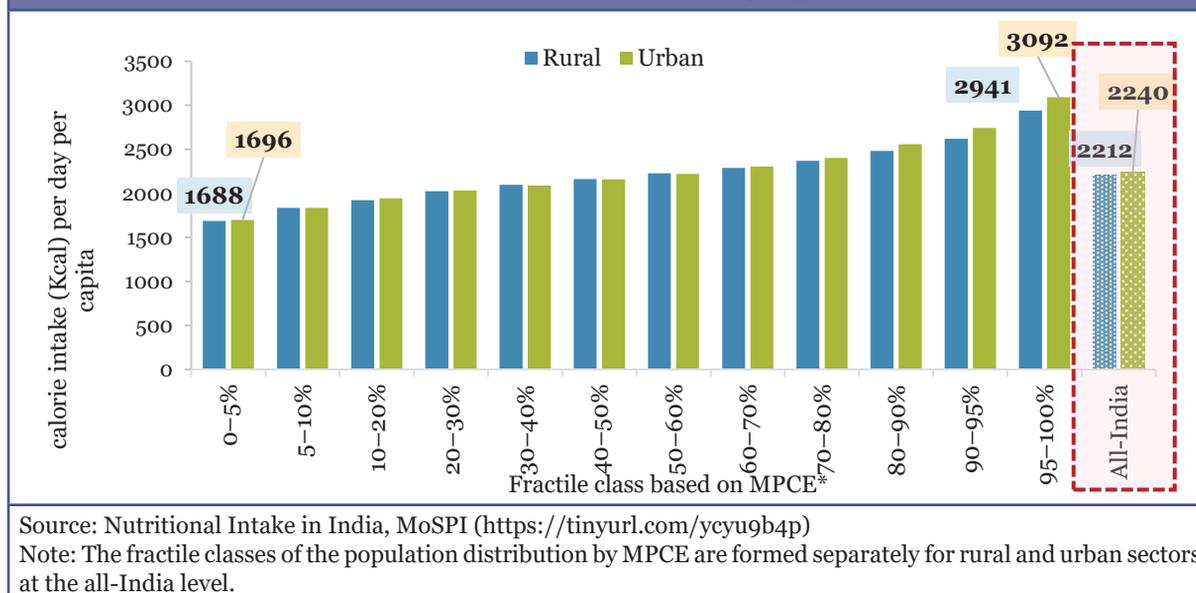


<sup>116</sup> The report uses data collected during the household consumption expenditure survey 2022-23 and 2023-24 on the consumption of food items by the members of the households during specified reference periods. Based on the food consumption data and utilising the nutrient content values of different food items, estimates of per day per capita and per day per consumer unit intake of calories, protein and fat have been generated at various levels of disaggregation, namely, State, sector, fractile classes of MPCE, etc.

The data for 2009-10 is based on NSS’s 66th round (2009-10), and data for 2011-12 is based on NSS’s 68th round (2011-12) consumer expenditure survey. The data for 2022-23 and 2023-24 is based on the household consumption expenditure survey conducted during August 2022 – July 2023 and August 2023 – July 2024.

<sup>117</sup> Nutritional Intake in India (2022-23 and 2023-24): <https://tinyurl.com/ycyu9b4p>

**Chart XI.12: Convergence of per day per capita calorie intake in urban and rural areas in 2023-24**



11.52. At over 1.8 lakh AAMs, community health officers and primary healthcare teams deliver services for the prevention and management of malnutrition among children, as well as maternal nutrition. The initiative provides screening, early management, referral, and follow-up for children's nutritional disorders (deficiencies, overweight/obesity), along with counselling and support for mothers/caregivers on infant and young child feeding. While there are several initiatives focused on nutrition, going forward, the policy focus needs to address the underlying factors that influence dietary preferences (Box XI.8).

### Box XI.8: Nutrition for a future ready India

Initiatives directly targeting nutrition outcomes range from the NFSA public distribution measures, the Poshan Abhiyan for children, supplementary nutrition for adolescent girls, mid-day meals, to take-home rations for expecting and lactating mothers, both by the union and state governments. These are complemented by initiatives/campaigns focused on exclusive breastfeeding and complementary feeding, reproductive health, highlighting the benefits of nutrition in the school curriculum, and awareness about lifestyle disease prevention, among others. However, the concerns continue to prevail and, in some cases, worsen. There is a need to acknowledge the presence of underlying factors that affect nutrition, such as diversity and quality of food available, changing socio-cultural patterns of consumption, food fads and taboos, and inadequate knowledge about nutrition.

An analysis of food patterns and preferences reveals that a significant segment of the population in India consumes far more cereals than recommended, along with less protective foods such as legumes, milk, nuts, vegetables, and fruits. For example, in the urban region of north India, fat intake (67.3 g) was among the highest; Northeast India consumed the

highest total calorie (2908 Kcal) and carbohydrate (457 g) per day; highest percent protein from meat, poultry, fish and sea foods was observed in the urban (16.9 per cent) and rural (28 per cent) of southern regions. Further, only 8.7 per cent of the population in rural areas and 14.3 per cent of the population in urban areas consumed milk and milk products as per recommended levels.<sup>118</sup> Findings from EAC-PM study show that the dietary diversity of micronutrient intake has improved significantly over the last decade (2011-12 to 2022-23) across all consumption classes, with the largest gains observed among the bottom 20 per cent of households. This improvement further reflects better access to micronutrient-rich foods, such as fruits, eggs, fish, meat, and milk, enabled by advances in infrastructure, transport, and storage, pointing to a meaningful, broad-based improvement in diet quality.<sup>119</sup>

All first-line interventions, from infancy through adolescence to adulthood, need to be strengthened to move from merely targeting accessibility to also focusing on quality standards of food and supplements that are delivered and bioavailability, along with tracking outcomes. The current interventions and new ones will need to be based on more disaggregated evidence on food habits and the prevalence of diseases in the region/state, while also considering access to a diverse range of sources. Adopting a whole-of-life approach for nutrition interventions enables all implementing agencies to collaborate. Similarly, the supply of processed and packaged protein-rich foods, as well as high-quality micronutrient- and mineral-fortified foods, can be incorporated into rations, mid-day meals, and other meals, ensuring both quality and nutrition. Traditional foods, such as millets and lesser-known pulses, may be considered for distribution through the public distribution system, ensuring that they do not perpetuate reliance on cereals and help widen dietary diversity. Further, there is also evidence of significant improvement in dietary diversity across consumption classes and states, which is influenced by better infrastructure and access to a wider variety of foods.<sup>120</sup> The most significant gain in dietary diversity has been reported in the bottom 20 per cent of households and the Northeastern states.

The 2024 ICMR–NIN Dietary Guidelines<sup>121</sup> address India's evolving food environment. They tackle the dual burden of malnutrition-overnutrition and rising obesity, while emphasising sustainable food choices, micronutrient sufficiency, and the prevention of diet-related NCDs. Key recommendations include consuming a diverse range of foods, increasing intake of vegetables and legumes, and reducing consumption of salt, fat, and sugar. The guidelines also promote regular physical activity and serve as a vital resource for public health policymakers, nutritionists, and the wider public.

Dietary reforms should be treated as a public health priority and hold a prominent place in initiatives for the prevention of NCDs, alongside integration with AYUSH for effective management. The efforts to popularise locally grown food, traditional foods and traditional

<sup>118</sup> ICMR- National Institute of Nutrition Report 2020 What India Eats Report 3-2-21.cdr

<sup>119</sup> Kapoor, M., Ravi, S., Rajan, S., Dhamija, G., & Sareen, N. (2024). Changes in India's food consumption and policy implications: A comprehensive analysis of Household Consumption Expenditure Survey 2022-23 and 2011-12 (Working Paper). Economic Advisory Council to the Prime Minister (EAC-PM Working Paper Series EAC-PM/WP/30/2024): <https://tinyurl.com/yeykwx7e>

<sup>120</sup> Changes in India's food consumption and policy implications Comprehensive Nutrition Report\_3Sept2024\_SR\_MK

<sup>121</sup> DGI\_2024.pdf

cooking methods are reflected in the increasing number of social media influencers creating content around such knowledge and practices. The attractiveness and reach of social media should be leveraged to disseminate the importance of nutrition in the prevention and management of NCDs. Sustained awareness generation and education are possible only with a change in behavioural choices, and it can be enabled by embedding the messages in a culturally relevant manner.

11.53. Schools serve as formative environments where children learn and adopt healthy nutritional and physical activity practices. Considering the amount of time children spend at school, it is an ideal place to encourage them to learn and practice healthy habits. A study of school-based, family-involved interventions for tackling childhood obesity prevention across countries concluded that having teachers actively involved and trained by health professionals to coordinate school-based activities is more effective in promoting healthy energy-balance-related behaviours during school hours.<sup>122</sup>

11.54. School-level interventions such as increasing water accessibility, providing free fruits, offering only healthy options in the school cafeteria, and removing vending machines will provide a choice of healthier foods. Integrating mandated daily and weekly physical activity time with classroom activity is crucial for both mental and physical health and will reinforce the benefits. The formation of a wellness council by school staff, along with a written wellness policy, may enhance the effectiveness of school-level interventions. Regular training and workshops for parents and staff, and collaboration with the local community, will enhance the effectiveness of measures. Any intervention at the school level would only be effective with the active participation of the families and communities to ensure that healthy habits are followed outside schools as well. To incentivise both public and private schools to prioritise student well-being, a school well-being score may be calculated. This would allow parents to assess school performance based on both the academic achievements and the students' well-being.

11.55. Today, the market offers a growing range of products sold as energy drinks, health drinks, nutrient drinks, stress-relief formulations, and weight-loss beverages, many of which make quasi-medical claims without being considered medicines. These products are known as 'health supplements' or 'nutraceuticals'. The regulations for nutraceuticals are continually evolving, with supplements often occupying a grey area between food and medicine. Since these products can be purchased without a doctor's prescription, concerns exist that long-term, unregulated use, particularly of poorly

<sup>122</sup> Lambrinou, C. P., Androutsos, O., Karaglani, E., Cardon, G., Huys, N., Wikström, K., Kivelä, J., Ko, W., Karuranga, E., Tsochev, K., Iotova, V., Dimova, R., De Miguel-Etayo, P., González-Gil, M., Tamás, H., Jancsó, Z., Liatis, S., Makrilakis, K., & Manios, Y.; Feel4Diabetes-study group. (2020). Effective strategies for childhood obesity prevention via school-based, family-involved interventions: A critical review for the development of the Feel4Diabetes-study school-based component. *BMC Endocrine Disorders*, 20(Suppl 2), 52. <https://doi.org/10.1186/s12902-020-0526-5>

manufactured products, may lead to adverse reactions. Consumers must be clearly informed and educated that such products are not equivalent to clinically validated therapies, enabling them to make an informed choice.<sup>123</sup>

11.56. While national nutrition programmes play a vital role in setting the tone of the policy framework and extending financial support, it is the states that, through successful on-the-ground implementation, determine the efficiency and effectiveness of programmes. State-level innovations are powerful tools for addressing local challenges and issues. Additionally, social & behaviour change communication (SBCC) strategies have been effective in achieving the desired scheme outcomes. These strategies have been employed in large-scale health initiatives such as HIV prevention and control, polio vaccination, routine immunisation, and COVID-19 vaccination. Similarly, schemes such as the Swachh Bharat Mission, Rural Water Supply and Sanitation Programmes, and the PM Fasal Bima Yojana have integrated SBC as part of their implementation and seen improvements in demand generation and sustained behavioural changes.

11.57. One such state-level example is Rajasthan's Cash Plus Model, which integrates DBT with behaviour change interventions to tackle child and maternal undernutrition.<sup>124</sup> The learnings from the programme can inform implementation strategies in other states to better achieve scheme outcomes. Box XI.9 outlines the key lessons learned from this model.

#### **Box XI.9: Leveraging social & behaviour change communication: Lessons from the Rajasthan Cash Plus Model**

The NFHS 5 data showed that in Rajasthan, 31.8 per cent of children under five years of age were stunted, 27.6 per cent were underweight, and 16.8 per cent were wasted.<sup>125</sup> The pandemic severely impacted the delivery of cash transfer schemes targeting maternal and child health, including the PMMVY and the state-funded Mukhya Mantri Matritva Poshan Yojana. This led to delays in payments and the diversion of funds by beneficiaries for purposes other than those intended. In response, the government of Rajasthan launched the Cash Plus model.<sup>126</sup>

Under this initiative, the two existing cash transfer schemes were converged and piloted in five tribal districts.<sup>127</sup> The initiative acknowledged that traditional practices, myths, and

<sup>123</sup> FSSAI requires that labelling on the article of food shall be in accordance with the Food Safety and Standards (Packaging and Labelling) Regulations, 2011, and the specific labelling requirements provided in these regulations. Nutraceuticals must not claim to prevent, treat, or cure diseases; any health-related claims must be scientifically supported and approved, and product labels must clearly identify the item as a nutraceutical, disclose ingredients and quantities, provide usage and safety warnings (including 'NOT FOR MEDICINAL USE'), and include storage and precautionary information. <https://tinyurl.com/4p58u5xz>

<sup>124</sup> RajPusht Cash plus behaviour change project report: <https://wcd.rajasthan.gov.in/order/detail/1022/0/199715>

<sup>125</sup> Rajasthan NFHS V (2019-21) Factsheet: <https://www.nfhsiips.in/nfhsuser/publication.php>

<sup>126</sup> <https://rajpusht.in/about/>

<sup>127</sup> Baran, Baswada, Dungarpur, Udaipur and Prapatgarh

deeply ingrained socio-cultural factors influenced food habits and child-feeding practices; therefore, it designed a tailor-made SBCC strategy in conjunction with the cash transfer.

The SBCC strategy clearly segmented the targeted audience and went beyond the primary target of pregnant and lactating mothers to reach out to husbands, mothers-in-law, other family members, and the larger community with contextualised key messages.<sup>128</sup> To ensure proper behaviour modification among the target audience, Anganwadi workers (AWWs) were trained based on a custom-made AWW guideline, 'Margdarshika', to provide nutrition counselling during home visits and to conduct group counselling on maternal and child health. Simultaneously, Auxiliary Nurse Midwives (ANMs) were trained to provide individual counselling to improve understanding of the need for antenatal care. These two interventions were positioned as the primary interpersonal communication approaches. ASHA (Accredited Social Health Activist) workers organised meetings of Village Health Nutrition and Water Sanitation Committees, providing an opportunity to discuss nutrition and health issues in these meetings, thereby encouraging community participation. Awareness sessions were conducted by frontline workers during community programmes such as Godh Bharai and Annaprashan. Multimedia campaigns were used across print media, radio, and television channels to create awareness about the scheme and its benefits. Mid-media methods, such as street plays, puppetry, and wall paintings, were utilised to help retain the key messages.

Recognising that men mostly owned smartphones and consumed short videos, and acknowledging growing social media use among the target audience, digital campaigns were used for outreach. The 'Bahubali' campaign was developed and shared on Facebook, YouTube, and aired on movie channels. It reimagined Bahubali as a caring family man rather than a stereotypical 'manly' figure, featuring a four-part web series on shared household responsibility. These efforts promoted positive gender norms and shared nutritional duties.

The results were encouraging. Compared to 2022, 54 per cent more women are using cash specifically for accessing nutrition, and the proportion of women using cash for food increased from 30 to 89 per cent in 2025.<sup>129</sup> 35 per cent more women have gained over 6 kg during pregnancy; 49 per cent more women are using local food items, ensuring improvement in dietary diversity, and a more diverse diet is being provided to children above 6 months of age. The SBC strategy has enabled informed decision-making among beneficiaries, shifted social attitudes, debunked myths, and encouraged community participation. Between 2022 and 2025, a 35 per cent reduction in prevalent myths and taboos surrounding maternal nutrition and awareness among men increased from 18 per cent to 62 per cent. These behavioural change interventions ensured that the financial transfer is utilised by the beneficiaries in the desired manner and that the positive practices adopted by them are sustained.

As welfare schemes grow, states must go beyond service delivery to understand behavioural factors influencing benefit use. Unlike other schemes focused on uptake, financial transfers rely on beneficiaries using aid as intended. Incorporating SBCC as a core, well-resourced

<sup>128</sup> RajPushtika-Compilation.pdf

<sup>129</sup> A-Comprehensive-Look-at-RajPushts-SBC-Strategy-in-Action.pdf

part of programme design can address barriers, improve household decision-making, promote gender norms, and dispel myths, ensuring financial support yields desired results. A structured, locally-informed SBC approach supported by frontline workers and communication channels can foster sustained behaviour change and amplify long-term impact.

11.58. Just as increased UPF consumption and rising obesity reveal how modern lifestyles shape health outcomes, the growing prevalence of digital addiction highlights another critical behavioural risk in today's society. While obesity and inadequate nutrition threaten the physical health of youth, digital addiction undermines their cognitive and social development. Together, these interconnected challenges necessitate policies to safeguard the health and human capital of the next generation.

### **Digital addiction: Cognitive and psychological impacts**

11.59. India has made significant strides towards a digitally empowered society, driven by a rapidly growing digital economy, robust public digital infrastructure and affordable internet. The digital economy contributed 11.74 per cent to the national income in FY23, with projections of 13.42 per cent in FY25, reflecting usage and monetisation at scale.<sup>130</sup>

11.60. Internet connections in India grew from 25.15 crore (2014) to 96.96 crore (2024), supported by nationwide 5G deployment and BharatNet fiber connectivity to 2.18 lakh Gram Panchayats. 85.5 per cent of households own at least one smartphone (2025), reflecting near-ubiquitous access and driving digital usage across all demographic groups. In 2024, 48 per cent of internet users watched videos online, 43 per cent accessed social media, 40 per cent used email and listened to online music, and 26 per cent made digital payments. In absolute terms, these shares translate into roughly 40 crore users for OTT (over-the-top) video and food delivery and almost 35 crore for social media.<sup>131</sup>

11.61. Thus, India's youth are living in an intensely digital environment. While access fuels learning, jobs, and civic participation, compulsive and high-intensity use can impose real economic and social costs, ranging from lost study hours and reduced productivity to healthcare burdens and financial losses resulting from risky online behaviours. With near-universal mobile/internet use among 15–29-year-olds, access is no longer the binding constraint; the focus needs to shift to behavioural health considerations such as the rising problems of digital addiction, quality of content, well-being impacts, and digital hygiene.

11.62. Digital addiction is described as addictive behaviour linked to digital devices, including smartphones, the internet, gaming, and social media addiction (Ali, Jiang

<sup>130</sup> PIB-Ten Years of Digital Progress Building an Inclusive and Future-Ready India

<sup>131</sup> State of India Digital Economy Report 2025

et.al. 2015<sup>132</sup>; Meng et al., 2022<sup>133</sup>). It is typically framed as a behavioural pattern of excessive or compulsive engagement with digital devices or online activities that leads to distress and functional impairment, described as persistent, excessive, or obsessive computer and online use, causing impairment in psychology.<sup>134</sup>

11.63. Digital addiction negatively affects academic performance and workplace productivity due to distractions, ‘sleep debt’, and reduced focus. It also erodes social capital through weaker peer networks, lower community participation, and diminished offline skills. Beyond direct economic costs from online purchases, gaming, and cyber fraud, it can reduce employability, productivity, and lifetime earnings. Compulsive digital use is linked to anxiety, stress, depression, and sleep disturbances, especially among students facing academic pressure and exposure to cyberbullying and high-stimulus platforms.

11.64. Research on digital addiction highlights distinct risks and mental health consequences among youth. Social media addiction is strongly associated with anxiety, depression, low self-esteem, and cyberbullying stress, with multiple Indian and global studies confirming its high prevalence among those aged 15-24. Compulsive scrolling and social comparison are particularly linked to anxiety and depressive symptoms. Gaming disorder shows evidence of causing sleep disruption, aggression, social withdrawal, and depression, with adolescent populations especially vulnerable. Online gambling and real money gaming present evidence of harm, including financial stress, depression, anxiety, and suicidal ideation. Finally, streaming and short video compulsion carry evidence linking binge-watching and endless video loops to poor sleep hygiene, reduced concentration, and heightened stress. Together, these findings underscore the multifaceted nature of digital addiction and its significant impact on mental health.

11.65. Social connections play a crucial role in the mental well-being of an individual. Evidence suggests that frequent face-to-face socialising correlates with higher mental well-being.<sup>135</sup> The Box XI.10 discusses how social connectedness impacts mental health and suicide rates and presents the findings of a study conducted on this aspect.

#### Box XI.10: Getting by, with a little help from friends

‘We lived on farms, then in cities, and now we will be living on the internet’<sup>136</sup>

132 Ali, R., Jiang, N., Phalp, K., Muir, S., & McAlaney, J. (2015). The emerging requirement for digital addiction labels;

133 Global prevalence of digital addiction in general population: A systematic review and meta-analysis; Clinical Psychology Review; Meng, S. Q. et al (2022); <https://doi.org/10.1016/j.cpr.2022.102128>

134 APA Dictionary of Psychology

135 <https://tinyurl.com/5x4xv66t>

136 Dialogue from The Social Network; USA (2010)

Aristotle presented a view of friendship with three general characteristics: Utility, Pleasure, and Virtue.<sup>137</sup> The relationship between companionship and mental well-being has been well documented.<sup>138</sup> Humans are highly social animals, and our psychological and physical well-being is strongly related to our social connectedness and integration into social networks.<sup>139, 140</sup> and the quality of our close friendships<sup>141</sup>. Social connectedness not only impacts our hedonic well-being (HWB) but is also seen as significantly impacting our eudaimonic well-being (EWB).<sup>142</sup>

It is in this background that a study was done to examine the social connectedness in various states in India and how it links with suicide rates. To access a larger and more comprehensive dataset and to gain deeper insights, data from the Facebook Social Connectedness Index (SCI) was examined<sup>143,144,145</sup> and used as a measure of connectedness in a district-level geographical unit. SCI measures the relative probability of a Facebook friendship link between two Facebook users in different locations.<sup>146</sup> The dataset used contains over 60 million pairs of linkages between two geographical areas and their corresponding SCI numbers,<sup>147</sup> and those pertaining to India were further distilled down to the state and district levels.<sup>148</sup> To closely approximate in-person connectedness, the focus was placed on the SCI scores for connectedness within districts, since a within-district connection on Facebook is likely to have an in-person counterpart as well.<sup>149</sup>

137 Aristotle. (1999). *Nicomachean ethics* (Ostwald M., trans.). Upper Saddle River, NJ: Prentice Hall.

138 Demir, Özdemir & Weitekamp (2007); Looking to happy tomorrows with friends: Best and close friendships as they predict happiness

139 Holt-Lunstad J., Smith T. B., Baker M., Harris T., Stephenson D. (2015). Loneliness and social isolation as risk factors for mortality: A meta-analytic review

140 Fowler J. H., Christakis N. A. (2008). Dynamic spread of happiness in a large social network: Longitudinal analysis of the Framingham Heart Study social network

141 Wrzus C., Wagner J., Neyer F. J. (2012). The interdependence of horizontal family relationships and friendships relates to higher well-being

142 Anderson, A. R., & Fowers, B. J. (2020). An exploratory study of friendship characteristics and their relations with hedonic and eudaimonic well-being

143 Most studies of this nature typically include interviews and interactions with a representative sample however such studies by their very nature are smaller in scale.  
<https://tinyurl.com/2nar4e7f>

144 <https://data.humdata.org/dataset/social-connectedness-index>

145 <https://dataforgood.facebook.com/> Facebook, releases anonymised data in the public domain for use in research programmes. The data have been used for predicting the economic impacts of natural disasters, forecasting trade flows, and analysing social networks, among others. This dataset was published in October 2021.

146 <https://tinyurl.com/2nar4e7f>

147 The dataset used for this study is the Global Administrative Areas (GADM, version 2.8) and the European Nomenclature of Territorial Units for Statistics (NUTS3) [GADM/NUTS3 dataset]. The GADM/NUTS-level dataset was first introduced, described, and analysed in Bailey, Kuchler, Johnston, Russel, State, and Stroebel (2020). A separate set of files (gadm1\_nuts2\_levels and gadm1\_nuts3\_counties\_levels) provides the levels of each key in the GADM/NUTS files. Shape files for NUTS-level data and GADM-level data are also available for download. <https://tinyurl.com/4nmxfdu>

148 As they are too numerous to list here, the names of the districts are not included in this paper and all districts are referred to by their GDAM Shapefile reference codes.

The naming convention is ISO-Country-Name\_ID1 [State Code]\_ID2 [District Code] for eg. Araria in Bihar would have a GDAM reference code of IND5\_63. Certain districts also have a Taluk level breakdown however in interest of uniformity and smoothness of data the present examination is restricted to the district level.

149 <https://www.idfresearch.org/blog/18>

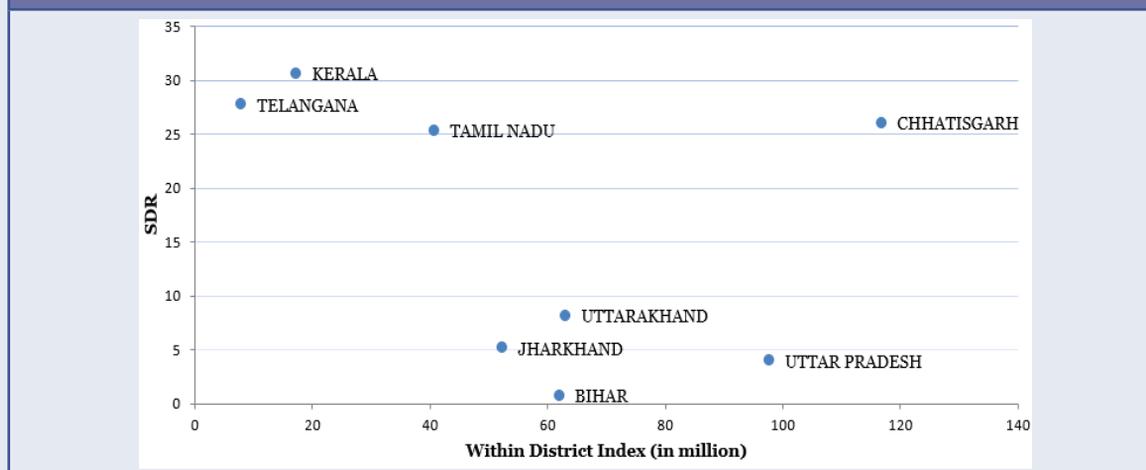
The SCI was first used by Bailey, Cao, Kuchler, Stroebel, and Wong (2018).<sup>150</sup> It measures the intensity of social connectedness between users based on location. Users are assigned to locations based on their information and activity on Facebook. The SCI between two locations  $i$  and  $j$  is defined as:

$$SCI_{i,j} = (FB\_Connections_{i,j} / FB\_Users_i * FB\_Users_j).$$

If SCI is twice as large, a given Facebook user in location  $i$  is about twice as likely to be connected with a given Facebook user in location  $j$ .<sup>151</sup> The measure adds some random noise and rounds off the Index, ensuring the anonymity of the data and preventing any single individual or friendship link from being identified. Most studies of this nature typically include interviews and interactions with a representative sample; however, such studies by their very nature are smaller in scale.

A plot of the suicide death rate (SDR) against the within-District SCI scores for a panel of eight selected states shows a broad reverse correlation of within-District connectedness with the SDR, i.e. states having districts with higher connectedness, and thus better in-person social networks, are generally seen as having lower SDRs [Chart XI.13].<sup>152</sup>

**Chart XI.13: Suicide death rates and within-district connectedness**



Connectedness visualised using chord diagrams [Chart XI.14] for the intra- and inter-connectedness of districts in Bihar, Uttar Pradesh, Kerala, and Tamil Nadu are presented below. The size of each chord represents the intensity of the connectedness between the geographic units. Fewer chords and relatively bigger arcs or similar-sized arcs indicate greater within-District connectedness.

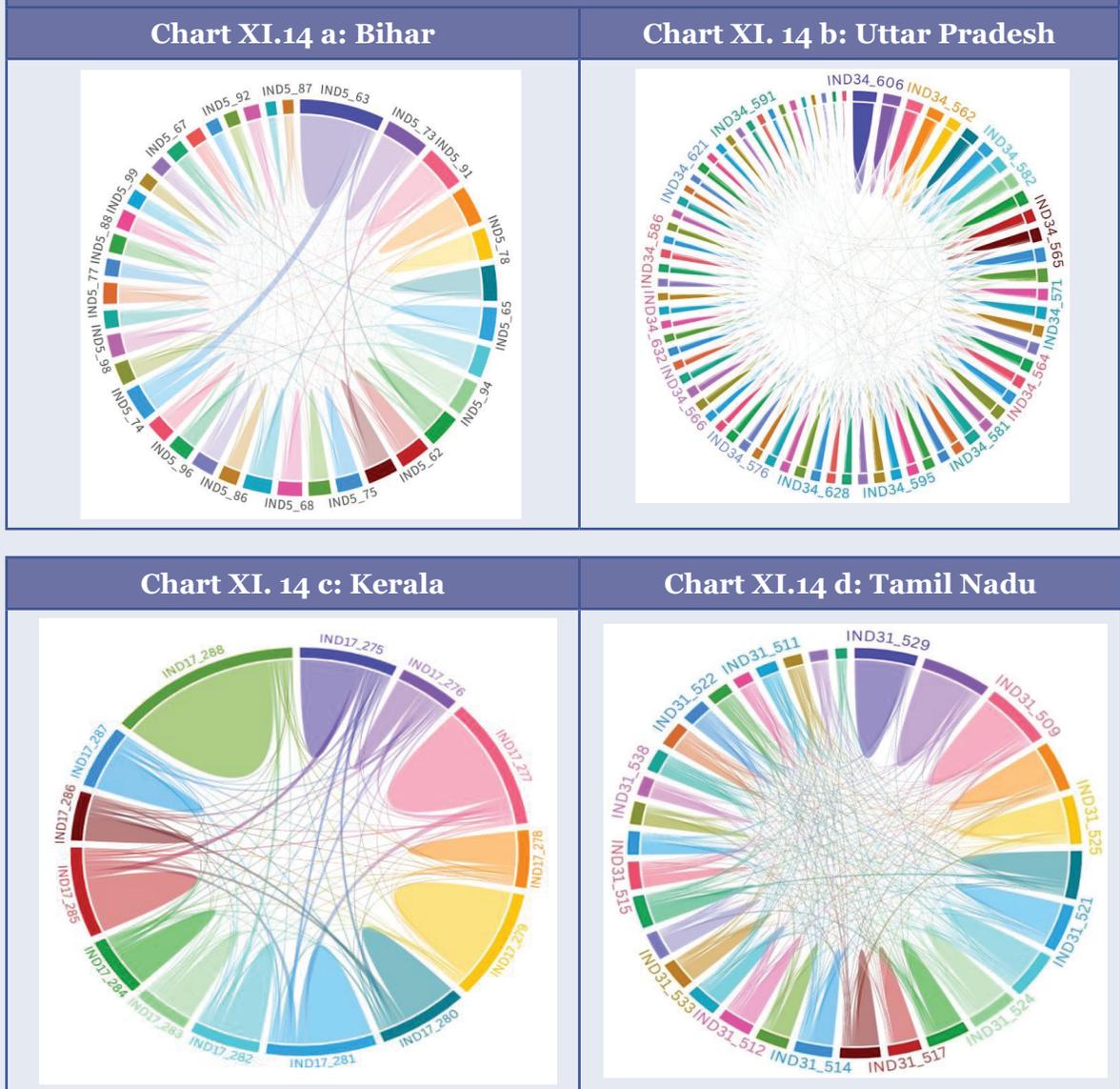
<sup>150</sup> Bailey, M., Cao, R., Kuchler, T., Stroebel, J., & Wong, A. (2018). Social connectedness: Measurement, determinants, and effects. *Journal of Economic Perspectives*, 32(3), 259–280. DOI: 10.1257/jep.32.3.259

<sup>151</sup> While the use of Facebook data has its limitations, given the social-demographic profiles of users, varying levels of tele-density, and data consumption, it was nonetheless used to discern some preliminary trends, given its large size and reach. Facebook is the largest social media platform globally, with 3.05 billion monthly active users worldwide [as of February 2024]; India has the largest number of Facebook users, with 403.4 million Facebook accounts as of October 2025 (<https://tinyurl.com/mx7j4jnm>) It is estimated that the 18-30 age group comprises 54.2 per cent of Facebook's users (<https://www.oberlo.com/statistics/facebook-age-demographics#>), and is therefore relevant for the study.

<sup>152</sup> Source: NCRB ADSI Report 2023 We understand that Chattisgarh is an outlier i.e. a State which shows a higher level of within-District connectedness yet has a high suicide death rate. The reasons would perhaps require a deeper dive.

Bihar and Uttar Pradesh display notably sparse chord networks (Chart XI. 14a & b), with thick, concentrated arcs within each district, suggesting that their digital social universe is primarily rooted and bounded within district-level communities. This sparsity of cross-district ties suggests that communities remain relatively geographically anchored, relying more heavily on local, in-person social bonds and being less dependent on distant, online-mediated relationships. The SDR for these states is very low, being 0.7 for Bihar and 3.9 for UP. Conversely, Kerala and Tamil Nadu (Chart XI.14c & d) exhibit densely woven networks of chords radiating across districts, indicating that their online social fabric is highly dispersed and geographically diffuse, and hence lower in person-to-person social connection. This is reflected in the relatively higher SDRs of 30.6 in Kerala and 25.3 in Tamil Nadu.

**Chart XI.14 Inter and intra-district connectedness**



*Note: It may be noted that in the above visualisations, the size of the arcs is dependent on the number of districts in the state. Therefore, arcs for a state like UP with a higher number of districts would be narrower as compared to a state like Kerala, which has fewer districts.*

India's challenge is to rebalance youth engagement by combining restrictive safeguards with positive offline opportunities and not to demonise technology. That balance respects the role of technology in modern learning and work while addressing the overloads that harm sleep, mood, attention, and finances, ensuring that we can mitigate economic losses, protect mental health, and maintain digital progress as a driver of empowerment rather than addiction.

## Global and national responses to digital addiction

11.66. Digital addiction among youth has become a significant public health concern worldwide, prompting regulatory, therapeutic, and educational responses from governments, health institutions, and civil society. The World Health Organisation (WHO) recognised online gaming addiction as a mental health condition in ICD-11 under 'Gaming Disorder,' defined by impaired control over gaming, prioritisation of gaming over other activities, and continued play despite negative consequences.<sup>153</sup>

11.67. Australia has introduced one of the world's strictest measures against youth digital addiction, a nationwide ban on social media accounts for children under 16. South Korea introduced the 'Shutdown or Cinderella law' in 2011, restricting minors from accessing gaming websites after midnight. This policy, grounded in the Game Industry Promotion Act, was later repealed in 2021 in favour of parental control models.<sup>154</sup> China has implemented a 'fatigue system' for gaming that restricts online gaming time (just one hour per day on weekends and holidays) and penalises overuse, enforced through real-name registration systems.<sup>155</sup> Singapore has taken a community-based approach through its Media Literacy Council, which promotes responsible digital citizenship and cyber wellness across schools and public platforms.<sup>156</sup> In the United Kingdom, the Digital Resilience Framework provides schools, policymakers, and tech companies with tools to embed digital resilience into education and product design.<sup>157</sup> Countries, including South Korea, Brazil, France, Spain, Finland, Australia, Japan, and some U.S. states, are restricting student smartphone use through classroom bans, school-wide limits, or curfews to curb distractions and protect student well-being. The Seoul Metropolitan Government launched 'I Will Centres' to prevent addiction and offer recovery counselling, promoting a healthy internet culture for the city's youth.<sup>158</sup>

<sup>153</sup> International Classification of Diseases, 11th Revision (ICD-11) 2019: ICD-11 for Mortality and Morbidity Statistics

<sup>154</sup> GAME INDUSTRY PROMOTION ACT-2018, South Korea

<sup>155</sup> State Council of China-Stricter limits on minors' online gaming

<sup>156</sup> IMDA Singapore

<sup>157</sup> UK Government- Policy paper Digital Resilience Framework

<sup>158</sup> Seoul 'I will Centre': <https://www.seoulsolution.kr/en/content/2073>

## India's response to digital addiction

11.68. In India, multiple measures address digital addiction among children. The CBSE has issued guidelines on safe internet use in schools and school buses.<sup>159</sup> The Ministry of Education's Pragyatah framework guides digital education planning with attention to screen time<sup>160</sup>, while the National Commission for Protection of Child Rights has issued guidelines on screen-time limits and online safety.<sup>161</sup>

11.69. Tele-MANAS (Tele Mental Health Assistance and Networking Across States), launched by the MoHFW in October 2022, offers a 24/7 toll-free mental health helpline (14416) across all states and UTs, connecting callers to trained professionals at no cost. A Tele-MANAS app launched in 2024 further expanded access. The service has received over 32 lakh calls since its launch, reflecting its relevance and impact.<sup>162</sup> The SHUT (Service for Healthy Use of Technology) Clinic at NIMHANS, Bengaluru, provides specialised care for excessive and compulsive technology use, focusing on adolescents and young adults. It also conducts free online sessions for parents to support healthier screen-time practices.<sup>163</sup>

11.70. The Online Gaming (Regulation) Act, 2025, represents a major step to address digital addiction and financial harm among youth. It bans online money games involving wagering, restricts advertising, and introduces a licensing framework for permissible skill-based games to curb compulsive use, debt, and related mental health concerns.<sup>164</sup>

## Way forward

11.71. A major challenge in addressing digital addiction in India is the lack of comprehensive national data on its prevalence and mental health effects. This hinders targeted intervention, resource allocation, and integration of digital wellness into national mental health strategies. The upcoming Second National Mental Health Survey (NMHS), led by NIMHANS and commissioned by MoHFW, is expected to generate empirical and actionable insights into the prevalence of mental health issues in the Indian context.

11.72. Developing a comprehensive set of indicators is essential to assessing the multidimensional effects of digital addiction interventions. Key metrics may include usage patterns (average recreational screen time), health outcomes (sleep quality,

<sup>159</sup> CBSE Circular: [https://cbseacademic.nic.in/web\\_material/Circulars/2017/32\\_Circular\\_2017.pdf](https://cbseacademic.nic.in/web_material/Circulars/2017/32_Circular_2017.pdf)

<sup>160</sup> Pragyata guidelines: <https://tinyurl.com/y9afzf9u>

<sup>161</sup> Guideline. Being Safe Online: <https://tinyurl.com/bddzs5ey>

<sup>162</sup> TeleManas: <https://telemas.mohfw.gov.in/telemas-dashboard/#/>

<sup>163</sup> Specialized Patient Care Services | NIMHANS Bangalore; <https://www.nimhans.ac.in/about-us/nimhans-in-media/struggling-with-your-childs-screen-time-nimhans-offers-free-online-sessions-to-help-parents-organized-by-the-shut-clinic-service-for-healthy-use-of-technology-and-the-centre-for-well-being-ncwb>

<sup>164</sup> PIB release dated 21 August 2025: <https://tinyurl.com/mr2jv75c>

anxiety and stress levels), academic and workplace performance (attendance and task completion), and safety concerns such as cyberbullying, online scams, and exposure to real-money gaming.

11.73. Digital addiction also affects adults. Awareness programmes in colleges and workplaces, technology-free zones, and ‘buddy’ or ‘mentor’ systems can promote healthier digital habits and build offline connections. Adults may be encouraged to adopt ‘digital diets’ involving voluntary device-free periods. For severe cases, community-based, device-free spaces can provide professional support. Karnataka’s ‘Digital Detox Centre - Beyond Screens’ serves as a resource hub for individuals facing digital addiction.<sup>165</sup>

11.74. To provide alternatives to digital spaces, governments and communities should establish offline youth hubs, particularly in urban slums and rural areas. Recognising that digital access cannot be fully restricted, moderated online safe spaces hosted by schools or similar institutions can also offer peer support and verified mental health resources supervised by trained facilitators. Schools play a critical role in shaping digital habits and should introduce a Digital Wellness Curriculum covering screen-time literacy, cyber safety, and mental health awareness. Measures such as cyber-safety drills, peer mentor programmes, and mandatory daily physical activity can build resilience. Dependence on online teaching tools, which expanded during COVID-19, should be reduced in favour of offline engagement.

11.75. Families should be educated and encouraged to promote screen-time limits, device-free hours and shared offline activities. Parental workshops should be provided through schools and community centres to train guardians in setting healthy boundaries, recognising signs of addiction, and using parental control tools effectively. Policies on age-based access limits may be considered, as younger users are more vulnerable to compulsive use and harmful content. Platforms should be made responsible for enforcing age verification and age-appropriate defaults, particularly for social media, gambling apps, auto-play features, and targeted advertising.

11.76. Promoting simpler devices for children, such as basic phones or education-only tablets, along with enforced usage limits and content filters, can further reduce exposure to harmful material, including violent, sexual, or gambling-related content. Network-layer safeguards, such as ISP-level interventions, can complement such measures by offering family data plans with differentiated quotas for educational versus recreational apps and default blocking of high-risk categories, with opt-in overrides available to guardians.

<sup>165</sup> Digital Detox Centre: <https://eitbt.karnataka.gov.in/avgc/public/121/digital-detox-centre/en>

11.77. Expanding the scope of Tele-MANAS to address digital addiction represents a natural evolution of India's national tele-mental health programme. Training dedicated counsellors and integrating Tele-MANAS with school and college systems can improve access, normalise help-seeking, and enable early intervention.

## OUTLOOK

11.78. India's health and education sectors require unwavering focus to unlock the nation's true potential, especially in addressing interconnected new emerging issues such as the double burden of CDs and NCDs, increasing digital addiction, concerning mental health issues, poor nutrition, and increasing obesity. Together, they threaten the demographic dividend by perpetuating cycles of unemployment, inequality, and lost productivity. Open acknowledgement and constructive public discussion are important initial steps in addressing these challenges and promoting effective solutions. Normalising conversations around mental health, screen-time habits, and lifestyle-related health issues can help foster collective awareness and action

11.79. Technology-driven surveys using platforms like the UDISE+, AISHE, ABDM and integration of AI tools can identify 'health hotspots' such as prevalence of obesity in urban slums or rising digital addiction in peri-urban schools. Public-private partnership can help develop frontline workers-led initiatives in India, employing technology like mobile apps, AI chatbots (ASHABot<sup>166</sup>), and digital dashboards (e.g., ASHA Kirana's M-CAT<sup>167</sup> and ASHA Digital Health<sup>168</sup>), to effectively manage chronic conditions such as diabetes, monitor infectious diseases including COVID-19, and enhance maternal and child health outcomes.<sup>169</sup> Running nationwide campaigns on Doordarshan and social media to highlight role models who inspire change in health and education efforts can be helpful.

11.80. In sum, prioritising education, skilling, digital wellness, health, nutrition, and dietary habits through open dialogue, feedback surveys, success stories, and relatable role models will forge resilient citizens. This holistic approach would ensure a healthier, educated, skilled, thriving India.

\*\*\*

---

166 <https://tinyurl.com/23zfftzj>

167 Srinidhi V, Karachiwala B, Iyer A, Reddy B, Mathrani V, Madhiwalla N, et al. ASHA Kirana: when digital technology empowered front-line health workers. *BMJ Global Health*. 2021;6:e005039. <https://doi.org/10.1136/bmjgh-2021-005039>

168 <https://tinyurl.com/3kvabrmy>

169 <https://tinyurl.com/2pz6zvmj>

# EMPLOYMENT AND SKILL DEVELOPMENT : GETTING SKILLING RIGHT



*India's workforce of over 56 crore holds tremendous potential for its economic growth. Labour market indicators point to a steady job market, with improving labour force participation, declining unemployment, and robust job creation in both the organised and unorganised sectors.*

*To fully harness the demographic dividend, creating quality jobs with sustainable livelihoods is essential. The government has been working towards creating decent employment opportunities through structural reforms and targeted interventions. The recently enacted Labour Codes aim to strike a balance between flexibility and workers' rights, focusing on ensuring industry competitiveness while promoting worker welfare. Structural barriers to female participation are being addressed through the provision of safe, affordable accommodation and flexible and hybrid work arrangements. There is a growing focus on expanding social security, income protection, and grievance redressal mechanisms for gig and platform workers to safeguard their well-being. While addressing the quantity of labour, it is equally important to improve its quality, as economic growth relies on both the size and capabilities of its labour force. To achieve this, opportunities for vocational education at all levels are vital for strengthening the skill ecosystem and realising the Viksit Bharat's vision.*

## INTRODUCTION

12.1. The labour markets in India are undergoing significant structural transformations driven by digitalisation, green energy transition, and emerging forms of employment such as gig and platform work. In the post-pandemic growth phase, the emphasis has shifted from the quantity of jobs to the quality of work, reflecting a more inclusive and sustainable vision of the labour market. Recent government initiatives aimed at promoting labour-intensive sectors and strengthening skill development underscore this renewed commitment to quality employment and human capital enhancement.

12.2 India continues to benefit from a large working-age population (in the age group 15-59), expected to exceed 98 crore in the next 10 years.<sup>1</sup> According to the UN

<sup>1</sup> Report of the Technical Group on Population Projections for India and States 2011-2036, Ministry of Health & Family Welfare, July 2020 <https://tinyurl.com/bdh9ahwe>

projections, India's demographic dividend<sup>2</sup> is expected to peak around 2030, when nearly 65 per cent of the population will fall within the 15-59 years group.<sup>3</sup> At the same time, the population is gradually ageing: the total fertility rate has fallen below replacement levels and life expectancy has steadily increased, raising the median age and signalling the onset of a demographic transition towards an older population.

12.3 While the expansion of the working-age population presents opportunities, the concurrent ageing trend introduces challenges for labour markets and social support systems. This demographic shift also opens the possibility of harnessing the longevity dividend.<sup>4</sup> Realising this dividend requires policies that extend health spans through preventive healthcare, healthy lifestyles, and management of non-communicable diseases (NCDs), alongside financial support, accessible healthcare, and social services for older adults. Epidemiological reports also indicate a rise in NCDs such as cardiovascular disorders, diabetes, and mental health challenges among the productive age groups. This concern has been discussed in detail in Chapter 11 of this Economic Survey. Investments in biomedical research, lifelong learning<sup>5</sup>, age-friendly work arrangements, and targeted programmes for informal and unorganised workers will ensure that longer life spans translate into sustained productivity and social well-being.<sup>6</sup>

12.4 The Economic Survey 2024-25 highlighted the need for deregulation in the labour market to enable a virtuous cycle of job creation and the need to address the skill mismatch in the labour market to improve the employability of the workforce. Skilling initiatives in employment not only bridge skill gaps and enhance productivity and decent work opportunities, but they also catalyse social mobility by enabling upward economic progression, thereby fostering greater equality in access to inclusive labour markets. Chapters 11 and 13 of this survey discuss the role of education, healthcare, community development, and infrastructure development in enhancing human capacity and promoting social mobility. It also highlights how the state can effectively utilise these policy tools to achieve more equitable outcomes.

12.5 This Chapter concentrates on supply-side policy levers to support inclusive employment development. An analysis of the employment landscape of the economy and the drivers of a more inclusive labour market has been presented. The first section examines the state of employment, focusing on the sectoral and gender distribution

---

2 The demographic dividend refers to the economic growth potential arising from a shift in a country's age structure, where the working-age population (15 to 64 years) outnumbered the non-working-age groups.

3 World Population Prospects: <https://tinyurl.com/5ept2hye>

4 The longevity dividend refers to the economic and societal benefits gained from longer, healthier, and more productive lives. ESG Sustainability Directory. (n.d.). Longevity Dividend → Term. <https://esg.sustainability-directory.com/term/longevity-dividend/>

5 Lifelong learning is the continuous process of acquiring knowledge and skills across all ages, education levels, environments, and purposes. It encompasses formal, non-formal, and informal learning in various settings, including schools, workplaces, communities, and online platforms

6 Scott, A., & Piot, P. (2025, June). The longevity dividend. Finance & Development, International Monetary Fund. <https://tinyurl.com/4z2je65v>

of the workforce. It discusses policy suggestions for boosting female labour force participation and increasing involvement in the manufacturing sector. The second section examines how the recently notified Labour Codes can catalyse job creation. It also discusses the evolving nature of the gig workforce. The third section addresses the challenge of re-strategising the vocational education framework to prepare the youth for the evolving demands of industry. The last section concludes with an outlook for employment and skilling landscape.

## EMPLOYMENT OVERVIEW

12.6 Employment is not a standalone metric but a downstream result of a thriving economy. As the 'State of Economy' chapter 1 of the Survey describes, India's economic growth remains resilient and stable, leading to improved employment opportunities and better labour market parameters. Over the past year, India has introduced several significant reforms, including a major overhaul of its tax regime and various deregulation measures (discussed in Chapter 16, Part II of this survey) aimed at boosting business growth and job creation.

12.7 As a result of these reforms, the labour market continues to show steady activity as revealed by official monthly and quarterly Periodic Labour Force Survey (PLFS) data alongside the establishment-level data from the Annual Survey of Industries (ASI) for the manufacturing sector and the Quarterly Bulletin of Unincorporated Sector Enterprises (QBUSE) for the non-agricultural sector. Together, these sources highlight improving labour force participation, falling unemployment, and strong job creation in both the organised and unorganised sectors.

12.8 The quarterly and monthly PLFS data show a steady labour market with seasonal variations.<sup>7</sup> It indicates that the period from April to September 2025 (H1 FY26) saw a declining unemployment rate (UR)<sup>8</sup> in the current weekly status (CWS)<sup>9</sup> with a stabilising labour force participation rate (LFPR)<sup>10</sup>, and substantial employment levels, signalling an improvement in employment conditions. A total of 56.2 crore people (aged 15 years and above) were employed in Q2 (July to September 2025) FY26, reflecting a creation of 8.7 lakh new jobs in Q2 compared to Q1 (April to June 2025) of FY26.<sup>11</sup>

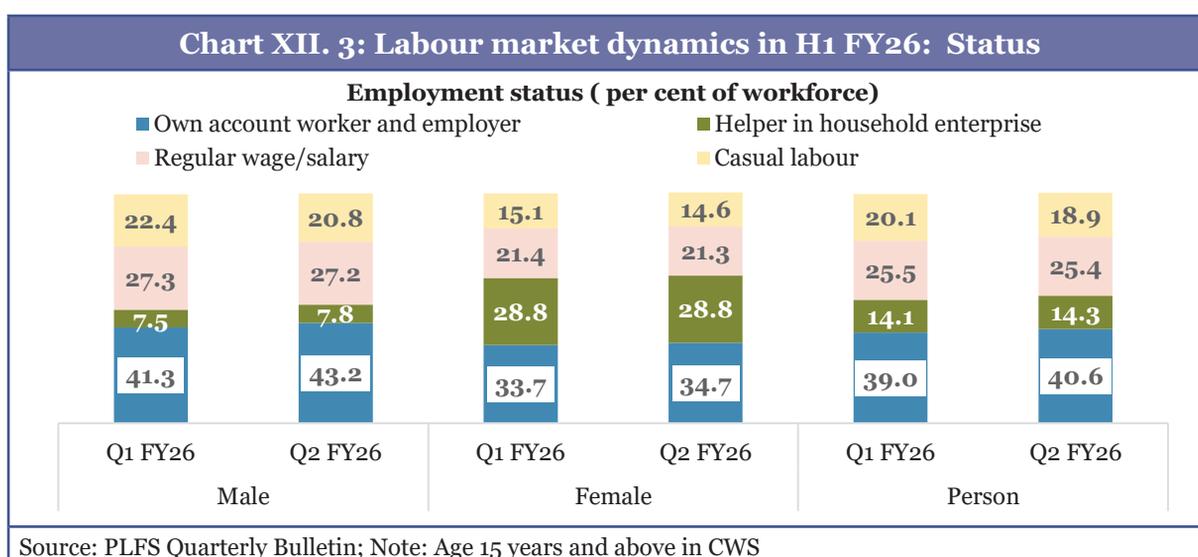
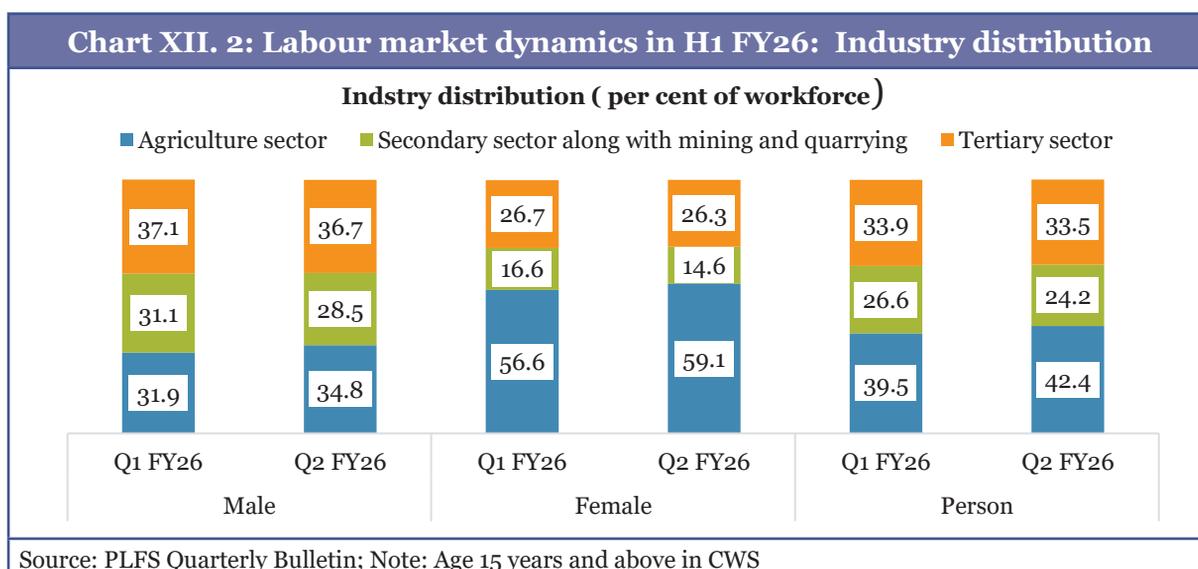
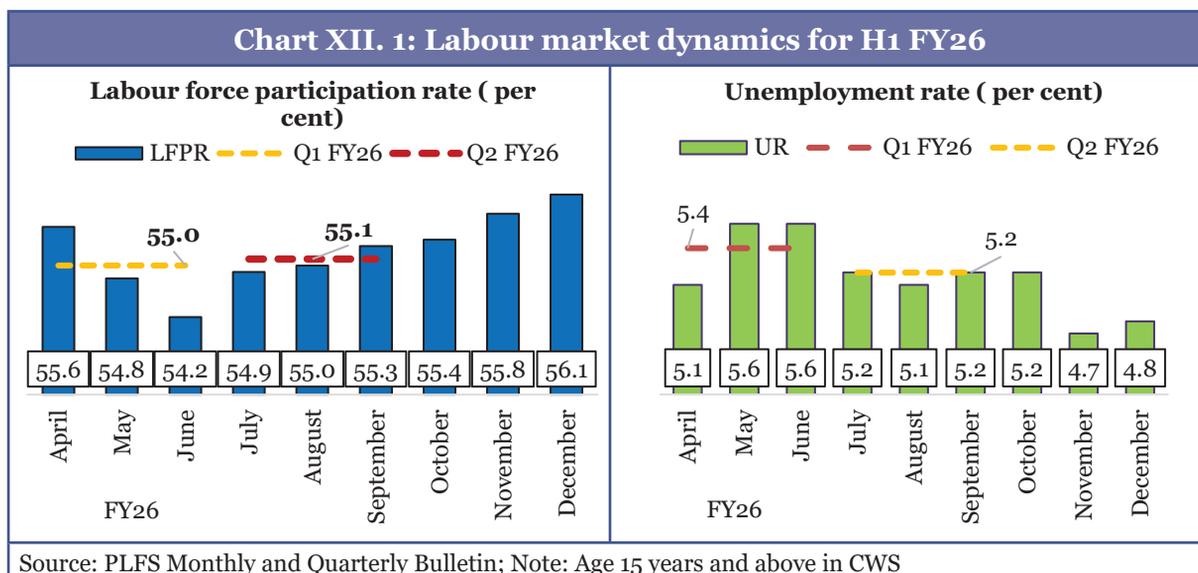
7 The Ministry of Statistics and Programme Implementation (MoSPI) published the first monthly bulletin of the revised PLFS in April 2025. The bulletin presents key labour market indicators, for both rural and urban areas, based on the Current Weekly Status (CWS) of individuals. Along with the monthly PLFS, MoSPI has revamped the quarterly survey to include all-India and rural estimates, as well as urban estimates. <https://tinyurl.com/ap6twwkw>

8 UR is defined as the percentage of persons unemployed among the persons in the labour force.

9 The activity status determined on the basis of a reference period of the last 7 days preceding the date of the survey is known as the CWS of the person.

10 LFPR is defined as the percentage of persons in the labour force (i.e. working or seeking or available for work) in the population.

11 PLFS Quarterly bulletin July- September 2025: <https://tinyurl.com/3bn85esj>



12.9 The PLFS data reveal a distinct and layered employment structure in India, marked by rural-urban differences. Rural employment is dominated by agricultural workers (57.7 per cent) and self-employment (62.8 per cent), with women workers showing relatively higher participation in them. In contrast, urban employment is primarily concentrated in the services sector (62.0 per cent), with regular wage or salaried jobs making up the largest share (49.8 per cent). At the aggregate level, in Q2 FY26, agriculture and self-employment accounted for 42.4 per cent and 55.8 per cent of total employment, respectively, while casual labour constituted 18.9 per cent.

12.10 As per the latest PLFS data for Q2 FY26, despite some shifts towards non-farm activities, agriculture still employs a significant share of rural workers, showing a seasonal increase tied to agrarian cycles. This highlights the crucial role of agriculture in rural employment and the necessity of designing policies that focus on decent work in this sector, particularly given its seasonal nature and the movement of workers between farm and non-farm activities.<sup>12</sup>

12.11 These employment patterns have important gender dimensions. The proportion of women engaged in self-employment or contributing to household enterprises, especially in rural areas, is relatively high. Women's participation in regular wage jobs is 10.8 per cent in Q2 FY26 in rural areas, coinciding with a major share of women working as 'own account workers/employers' (37.5 per cent) or 'helpers in household enterprises' (34.2 per cent). These patterns highlight a tendency among female workers towards independent work and entrepreneurship, which offers flexibility. The findings of the Time Use Survey (TUS) conducted by the Ministry of Statistics and Programme Implementation (MoSPI) highlight the dual burden that female workers face in terms of caregiving activities and unpaid work, which may explain their desirability or inclination towards flexible work models (**Box XII.1**).

#### Box XII.1: Balancing the scales: Insights from Time Use Survey 2024

The TUS enables the measurement of the time individuals spend on different activities. The primary objective of the survey is to measure the participation of men, women, and other groups of persons in paid and unpaid activities. India is among the few countries, including Australia, Japan, the Republic of Korea, New Zealand, the USA, and China, that conduct the National TUS to analyse how people allocate their time to various daily activities.<sup>13</sup>

<sup>12</sup> UN Sustainable Development Goal 8 defines decent work as opportunities for everyone to get work that is productive and delivers a fair income, security in the workplace and social protection for families, better prospects for personal development and social integration.

<sup>13</sup> PIB release of MoSPI dated 25 February 2025: <https://tinyurl.com/593d6cnh>

The MoSPI conducted the first all-India TUS from January to December 2019. The key findings of the recent TUS conducted from January to December 2024 (the second such all-India survey<sup>14</sup>) are as follows:

**Increased participation in employment and related activities<sup>15</sup>:** The survey reflects an increased participation rate<sup>16</sup> of both men and women in employment and related activities. During 2024, 75 per cent of males and 25 per cent of females in the 15-59 years age group participated in employment and related activities during the 24-hour reference period. Such participation was 70.9 per cent for males and 21.8 per cent for females aged 15-59 years in 2019.<sup>17</sup>

**Females are the predominant caregivers:** Looking at the time spent in caregiving activities, the survey findings reveal that women are the main caregivers. 41 per cent of females aged 15-59 years participated in caregiving for their household members; male participation in this age group was 21.4 per cent. Female participants spent about 140 minutes daily in caregiving activities, compared to 74 minutes spent by male participants aged 15-59 years.<sup>18</sup>

**More of the female activity time remains unpaid:** Evidence from the survey highlights gender differences in participation in paid and unpaid activities. For all persons aged 6 years and above participating in unpaid activities, the average time spent on these activities per day was 278 minutes, whereas for paid activities, it was 386 minutes per day.<sup>19</sup> Females spent, on average, 363 minutes a day on unpaid activities, while males spent only around 123 minutes a day on unpaid activities. Consequently, male participants spent 414 minutes a day in paid activities, against 302 minutes spent by female participants.

**Females balanced dual work burden:** The combined time spent on paid and unpaid activities by female members is higher than that of men. Female household members spend significantly more time on unpaid activities than men. While women participating in paid work contribute a considerable amount of time, their overall participation remains lower than that of men. The estimates highlight the dual burden of work on female participants. (refer to the chart below).

14 In TUS, 2024, respondents were asked about their activities performed in the designated time slots of 30 minutes and the same was recorded against the corresponding slot. In case of multiple activities in a time slot, a maximum of three activities performed for 10 minutes or more were recorded. Information on time use was collected for persons aged 6 years and above with a reference period of 24 hours. This survey covered 1,39,487 households (rural: 83,247 and urban: 56,240). Information on time use was collected from each member aged 6 years and above of the selected households.

Time Use Survey Factsheet; January - December, 2024:  
<https://tinyurl.com/3u6nzjhb>

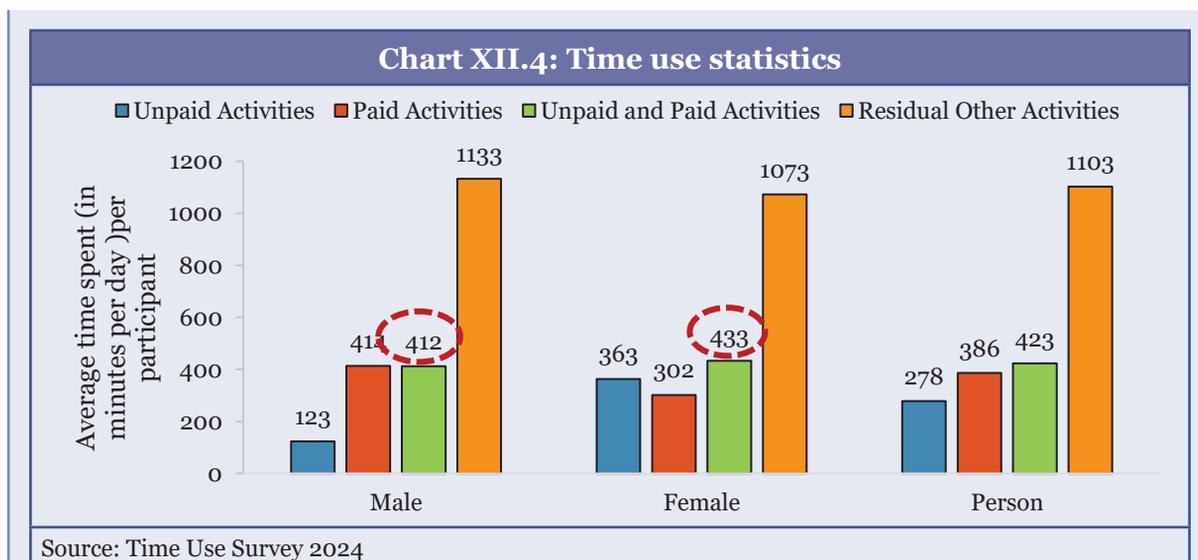
15 The activities reported by the respondents were codified following the International Classification of Activities for Time-Use Statistics 2016 (ICATUS 2016).

16 Participation rate in a day in any activity is calculated as the percentage of persons performing that activity during the day.

17 Ibid note 14 above

18 Ibid note 14 above.

19 Average time spent in a day per participant is defined as the average time spent in an activity by those participating in that activity. It is derived by considering only the participants for those activities.



The findings of the TUS 2024 highlight the care sector's vast potential for increasing the female labour force participation rate (FLFPR), as noted in the Economic Survey 2023-24.<sup>20</sup> The findings also reinforce the recommendations of the Economic Survey 2024-25 for increasing women's participation in the workforce, such as the provision of a flexible work policy, removal of statutory restrictions on women's labour force participation, availability of childcare facilities and crèches, skill development programmes aligned to industry needs, and the adoption of a long-term strategy focused on women and girls, which will help increase female participation in paid work.<sup>21</sup>

Over the past year, states have made significant progress in reforming statutory regulations to enhance women's participation in the economy. Key reforms include removing prohibitions on women's employment in designated 'hazardous' industries by 17 states/UTs and permitting night-time work for women in factories by around 22 states/UTs, as well as in commercial establishments by 33 states/UTs, thereby expanding employment opportunities for women while improving labour market flexibility. Chapter 16, Part II of this Economic Survey provides a detailed examination of the efforts undertaken by states to remove regulatory frictions in the labour market and unlock economic potential.

12.12 India's vision for Viksit Bharat 2047 places women at the core of the national development agenda, with progress envisioned to be women-led. Estimates suggest that increasing participation to around 55 per cent by the 2050 could be critical for maintaining a high annual GDP growth trajectory.<sup>22</sup> While women's participation in paid work is rising slowly, the imbalance underscores the need for policies that promote shared domestic responsibilities and better care infrastructure. Box XII.2 discusses key policy lessons for enhancing the FLFPR.

<sup>20</sup> Economic Survey 2023-24: <https://tinyurl.com/yty7akva>

<sup>21</sup> Economic Survey 2024-25: <https://tinyurl.com/4sawwuex>

<sup>22</sup> World Bank. (2024). India Country Economic Memorandum: Becoming a High-Income Economy in a Generation <https://tinyurl.com/yeef6m2d>

## Box XII.2: Enhancing female labour force participation

India has witnessed a positive trend in FLFPR in recent years. It has risen from 23.3 per cent in 2017-18 to 41.7 per cent in 2023-24, alongside a decline in UR from 5.6 per cent to just 3.2 per cent, reflecting a shift toward greater inclusion and economic empowerment.<sup>23</sup>

According to the Women and Men in India, 2024<sup>24</sup> report the share of female-headed proprietary establishments has shown a positive trend, increasing from 24.2 per cent in 2021-2022<sup>25</sup> to 26.2 per cent in 2023-24.<sup>26</sup> The share of female-headed establishments is highest for the manufacturing sector at 58.4 per cent in 2023-24. It is also observed that states with a higher presence of female-headed establishments, such as West Bengal, Karnataka, Gujarat, and Andhra Pradesh, also have higher FLFPR.

Despite these improvements in economic participation, women workers continue to face structural barriers, including limited mobility, lack of affordable housing, and inflexible work arrangements that conflict with caregiving responsibilities, underscoring the need for a multipronged policy approach to further enhance participation.

**Improving access to STEM:** Many highly educated women continue to work in low-productivity jobs or part-time roles due to social expectations, mobility constraints, and limited access to flexible formal employment. PLFS 2023-24 indicates that women aged 25 years and above with advanced degrees constitute only 2.9 per cent of the employed female workforce in rural and urban areas.<sup>27</sup> Women are also less likely to pursue STEM (Science, Technology, Engineering, and Mathematics) fields, accounting for 43 per cent of enrolment in 2021-22.<sup>28</sup> This could be attributed partly to perceptions of STEM as a male domain, care responsibilities, early marriage, and higher education costs.<sup>29</sup> Encouraging women's participation in STEM disciplines can help bridge the skills gap and expand their access to employment opportunities<sup>30</sup>, including white-collar services and modern manufacturing.

**Improving urban mobility:** Urban areas offer higher returns to education and better job quality. However, mobility-related barriers restrict women's ability to take up urban employment. The use of public transportation by women in India differs significantly from that of men. Women often travel during off-peak hours, accompanied by children, and make multiple short trips to handle household chores or perform caregiving activities.<sup>31</sup>

According to a World Bank study (2021), 31 per cent of women cited commuting as a barrier to working, 13 per cent reported childcare responsibilities were a barrier to commuting for

23 Annual PLFS report. Reference period July-June.

24 MoSPI released the 26th edition of its publication titled 'Women and Men in India 2024: Selected Indicators and Data', in April 2025 <https://tinyurl.com/yymu9m39>.

25 Source: Annual survey of unincorporated sector enterprises (ASUSE) 2021-22 with the reference period April 2021 - March 2022.

26 Source: Annual survey of unincorporated sector enterprises (ASUSE) 2023-24 with the reference period October 2023- September 2024.

27 Key Employment Unemployment Indicators, PLFS 2023-24 MoSPI.

28 AISHE 2021-22: <https://aishe.gov.in/aishe-final-report>.

29 Women in STEM: Challenges and Opportunities in India: IWWAGE (2024).

30 A Braided River: The Universe of Indian Women In science, (2021). UNESCO.

31 World Bank. (2023). Designing public transport in India that works for all: <https://tinyurl.com/mr22s6rf>.

work, and 19 per cent indicated that domestic duties were a barrier to commuting for work.<sup>32</sup> The study also highlighted that a lack of security leads women to choose safer but more expensive modes of transport, a phenomenon known as the ‘Pink Tax.’<sup>33</sup>

To overcome the systemic barriers women face in urban mobility, policy must focus on extending safety infrastructure and providing affordable intermediate transport to cover women's entire travel chain, from doorstep to destination. Key policy interventions could include enhancing visible women police presence for patrols in high traffic and pedestrian areas, especially during off-peak hours (like Kochi's Women Police Control Room vans and Hyderabad's SHE Teams), and increasing women drivers through targeted recruitment and training programmes (like National Capital Region Transport Corporation's initiative to train women aged 18-35 in professional driving through a structured 21-day course, combining classroom instruction, simulators, on-road training, and licensing support). Furthermore, the prioritisation of safe and accessible walking and cycling infrastructure in urban areas with gender-responsive elements like adequate lighting and safe crossings, and enhanced safety features (such as emergency buttons in vehicles and police verification of drivers, Chennai's inclusive street design manual and Bhubaneswar's Janpath Street) is required at scale through sustained efforts.<sup>34</sup>

**Affordable housing for working women:** Expanding secure hostels and affordable rental housing can improve women's access to urban jobs. At the same time, women-centric industrial clusters and manufacturing hubs can create targeted avenues for female employment. The Sakhi Niwas scheme of the Ministry of Women and Child Development is a gender-inclusive infrastructure intervention designed to create a supportive ecosystem for women navigating work and mobility. Another example is Tamil Nadu's Working Women's Hostels Corporation (‘Thozhi Hostels’), set up through Public Private Partnerships (PPPs), with gender-responsive design, furnished rooms, crèches, kitchens, and shared spaces, which offers a practical blueprint for states seeking to expand women's workforce participation.

**Care economy:** Expanding the network of Anganwadi centres, integrating community crèches, and incentivising employer-linked childcare can ease the unpaid care burden. Professionalising care work can also generate formal employment for women within the social sector.

**Skill development:** Aligning training programmes with industry demand, particularly in manufacturing, renewable energy, digital services, and agro-processing, can ensure that women are equipped for emerging opportunities. Initiatives such as ‘Back to Work’ and ‘Returnship programmes’ for women who have taken career breaks can bridge re-entry barriers. Integrating self-help groups (SHGs) with the Micro, Small and Medium Enterprises

32 World Bank. 2021. Closing the Gap: Gender, Transport, and Employment in Mumbai. <https://tinyurl.com/a6kwr93h>

33 The pink tax refers to the extra amount that women pay for certain products (such as used cars, personal care products, and clothing) and services (such as mortgages and dry cleaning). The pink tax on mobility refers to the fact that women may have to pay a higher price to reach the same destinations because of gender-specific needs that are not addressed by the transport system.

34 Udaiti Foundation. (2025). Bridging gendered gaps in first and last mile connectivity across Indian cities. <https://tinyurl.com/maat3jtz>.

(MSMEs) ecosystem can further facilitate women's transition into formal enterprises, increase access to markets, and help them move from subsistence entrepreneurship to growth-oriented businesses.

**Flexibility in employment:** Policies should promote flexible work, hybrid models, and gender-responsive standards, including maternity benefits, equal pay, and harassment protection. The newly enacted Labour Codes now allow women workers to work from home (Section 59(5), Code on Social Security 2020) after availing themselves of the maternity benefit (Section 60, Code on Social Security 2020).

**Public-private partnership:** Several states are promoting women's participation in the workforce through innovative, partnership-based models. Telangana's WE-Hub connects women with start-up ecosystems and investors.<sup>35</sup> Kerala's Kudumbashree integrates microfinance and collective enterprises to engage women in non-traditional roles, such as construction, logistics, and facility management.<sup>36</sup> Maharashtra's Mahila Arthik Vikas Mahamandal links SHG to formal credit and enterprise support. Scaling these context-specific approaches can expand women's opportunities and accelerate their entry into higher-value work.<sup>37</sup>

Efforts to challenge restrictive social norms must continue through awareness campaigns, gender sensitisation in schools, and community-led initiatives that promote shared caregiving and domestic responsibilities. In addition, it is essential to expand women's access to credit and procurement opportunities. Mentorship and future-oriented skills such as digital literacy, hybrid work capabilities, and green job training can further enhance female workforce participation.

Increasing women's participation in the labour market is not merely a matter of inclusion but a key driver of India's long-term economic transformation, as higher female employment supports fairer labour market outcomes, strengthens household welfare and contributes to building a more inclusive, resilient, and productive economy on the path to Viksit Bharat by 2047.

## The unorganised workforce

12.13 Recent policy initiatives have prioritised identifying unorganised workers and enhancing their integration with the formal economy through the welfare and skill development systems. The Code on Social Security, 2020 (CSS) defines unorganised workers as home-based, self-employed or wage workers in the unorganised sector and includes a worker in the organised sector who is not covered by the Industrial Disputes Act, 1947.<sup>38</sup>

<sup>35</sup> <https://wehub.telangana.gov.in/>

<sup>36</sup> <https://www.kudumbashree.org/pages/171>

<sup>37</sup> <https://mavimindia.org/en/overview>

<sup>38</sup> 'Unorganised worker' means a home-based worker, self-employed worker or a wage worker in the unorganised sector and includes a worker in the organised sector who is not covered by the Industrial Disputes Act, 1947 or Chapters III to VII of the CSS (Section 2 (86)).

12.14 In this context, the e-Shram portal is steadily bridging the gap between informal and formal employment, serving as a key institutional mechanism for extending social protection to unorganised workers.<sup>39</sup> The portal serves as a National Database of Unorganised Workers, which includes data on construction workers, migrant workers, gig and platform workers, street vendors, domestic workers, and agriculture workers. As of January 2026, the portal has successfully registered over 31 crore unorganised workers, marking a significant advancement in India's efforts to formalise and support its informal workforce. Notably, women account for 54 per cent of total registrants, substantially strengthening the reach of gender-focused welfare schemes. Each registrant is assigned a Universal Account Number (UAN), which is linked to their Aadhaar and mobile number, ensuring the portability of scheme benefits when workers move across platforms, locations, or employment arrangements.

12.15 e-Shram is evolving into a comprehensive platform for unorganised workers. It facilitates the identification of job opportunities, apprenticeship opportunities, and skilling linkages, helping workers transition to improved employment prospects. These efforts align with the broader vision of enhancing productivity and social protection for India's informal workforce.

12.16 The platform facilitates the delivery of social security and welfare schemes to registrants. Eighteen (18) social security schemes, including 'One-Nation- One-Ration Card', National Social Assistance Programme, National Career Service (NCS), Pradhan Mantri Shram Yogi Maandhan (PMSYM). etc, have been integrated with e-Shram. The portal also shares details of e-Shram registrants with all states/UTs, which helps them ensure targeted delivery and widespread coverage of welfare schemes for unorganised workers.

12.17 Launched in 2015, the NCS is a one-stop solution connecting job seekers, employers, training providers and career guidance and counselling agencies.<sup>40</sup> It offers a range of services, including free registration, job application processing, interview assistance, and other employment-related services, and a multi-lingual helpline. The portal has a job fair module to streamline recruitment activity by engaging all stakeholders, i.e., model career centres, nodal officers, job seekers and employers at one platform. The portal's integration with the Ministry of External Affairs' eMigrate system enables certified recruiting agencies to post verified international job vacancies and provides job seekers with access to global opportunities under safe and monitored conditions.

---

<sup>39</sup> e-Shram portal: <https://eshram.gov.in/>

<sup>40</sup> NCS portal: <https://www.ncs.gov.in/>

12.18 Additionally, its integration with the Skill India Digital Hub (SIDH) enables candidates to enhance their skill sets before applying for jobs. The portal is partnering with private portals to provide free online training on 'career skills' and 'digital skills'. It is also linked with the Employees' Provident Fund Organisation (EPFO), the Employees' State Insurance Corporation (ESIC), DigiLocker, e-Shram, Udyam and SIDH, ensuring seamless access to workforce data. Currently, the portal is integrated with 30 State employment portals, including seven states/UTs, which are directly using it for job seeker registrations.

12.19 Since its launch, the portal has evolved into a key employment facilitation platform, with over 5.9 crore registered job seekers and 53 lakh job providers across diverse sectors and mobilising approximately 8 crore vacancies. It recorded over a 200 per cent increase in job vacancies in FY24 compared to FY23. Vacancies mobilised exceeded 2.8 crore in FY25 and have already crossed 2.3 crore by September 2025.

### **Employment in the organised manufacturing sector**

12.20 The ASI conducted by MoSPI, covers the organised manufacturing sector and provides insight into employment trends in the sector.<sup>41,42</sup> The ASI results for FY24 highlight the manufacturing sector's resilience, showing a 6 per cent YoY increase in employment over the previous year.<sup>43</sup> This translates to an addition of over 10 lakh jobs in FY24 compared to FY23. The sector added more than 57 lakh jobs over the past decade, between FY15 and FY24, with a compound annual growth rate (CAGR) of 4 per cent.

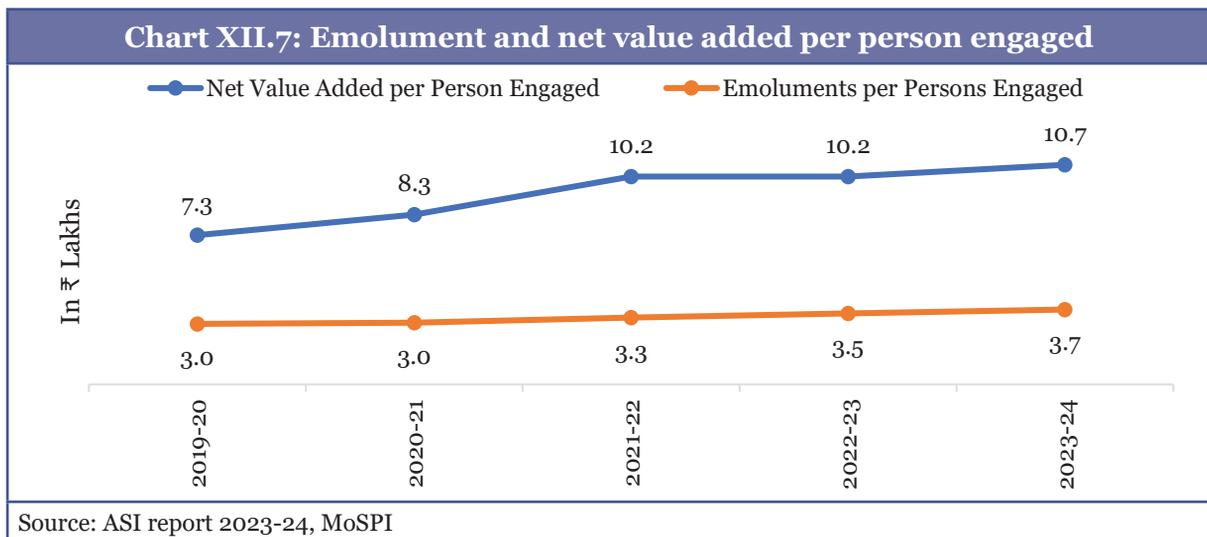
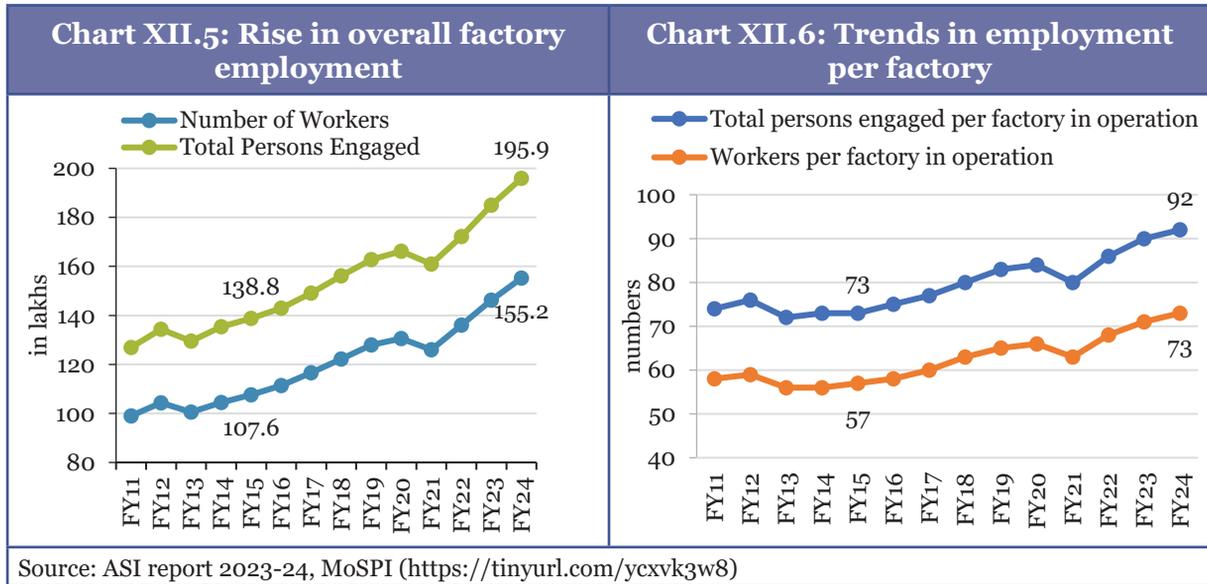
12.21 The survey highlights rising net value added (NVA) per person engaged in the organised manufacturing sector. This signals improved labour productivity and output efficiency, with each employed person contributing substantially more to total value creation than in previous years. The sector also experienced positive growth in emoluments per person.

---

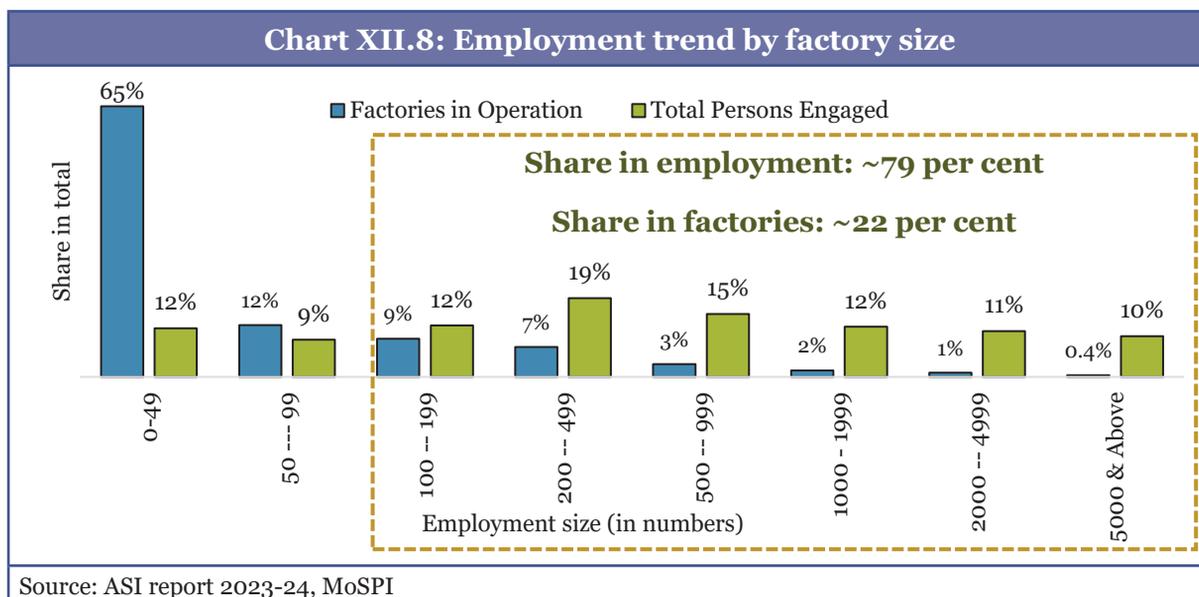
41 The ASI coverage extends to the entire Factory Sector comprising industrial units (called factories) registered under the Sections 2(m)(i) and 2(m)(ii) of the Factories Act, 1948, with ten or more workers with electricity or 20 or more workers without electricity. (<https://tinyurl.com/ycxvk3w8>)

42 The reference period of the survey is April 2023 to March 2024. The field work for this survey was carried out from October 2024 to June 2025.

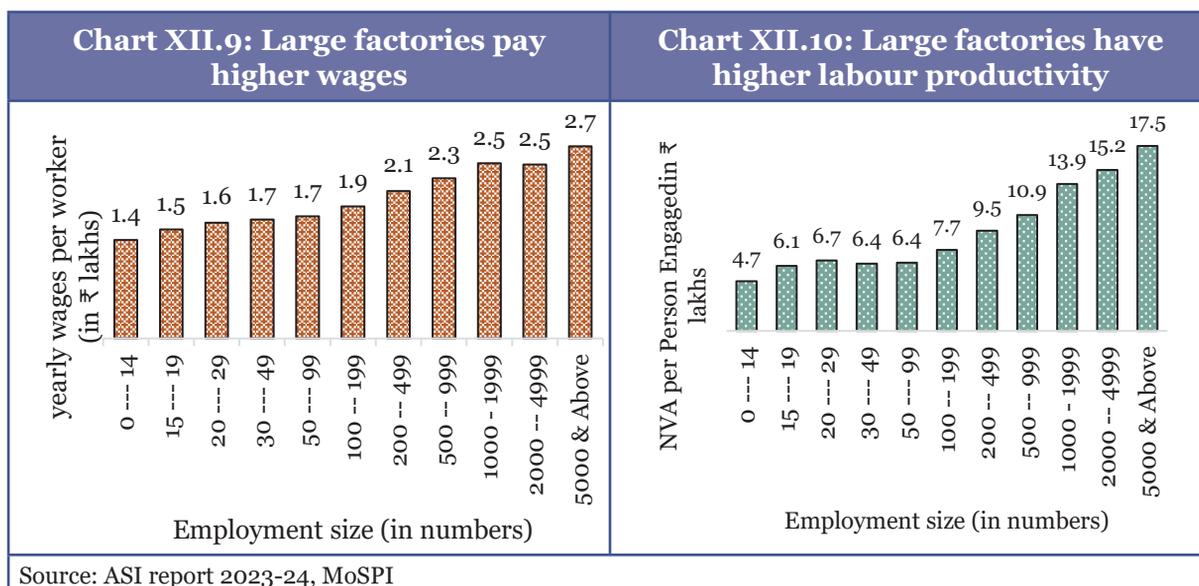
43 Employment refers to total persons engaged (TPE), which includes the employees (which include workers and clerical/administrative staff) and all working proprietors and their family members who are actively engaged in the work of the factory even without any pay, and the unpaid members of the cooperative societies who worked in or for the factory in any direct and productive capacity.



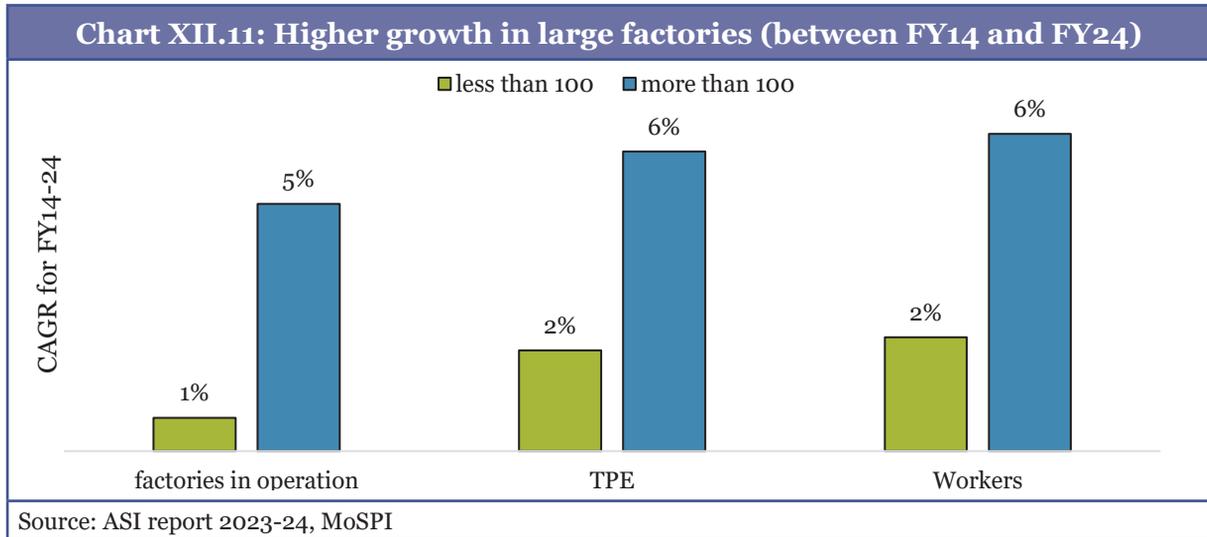
12.22 In FY24, 22 per cent of the factories in operation employed 79 per cent of the manufacturing workforce, whereas small factories (with less than 100 employees) accounted for 77 per cent of the total factories and only 21 per cent of the workforce.



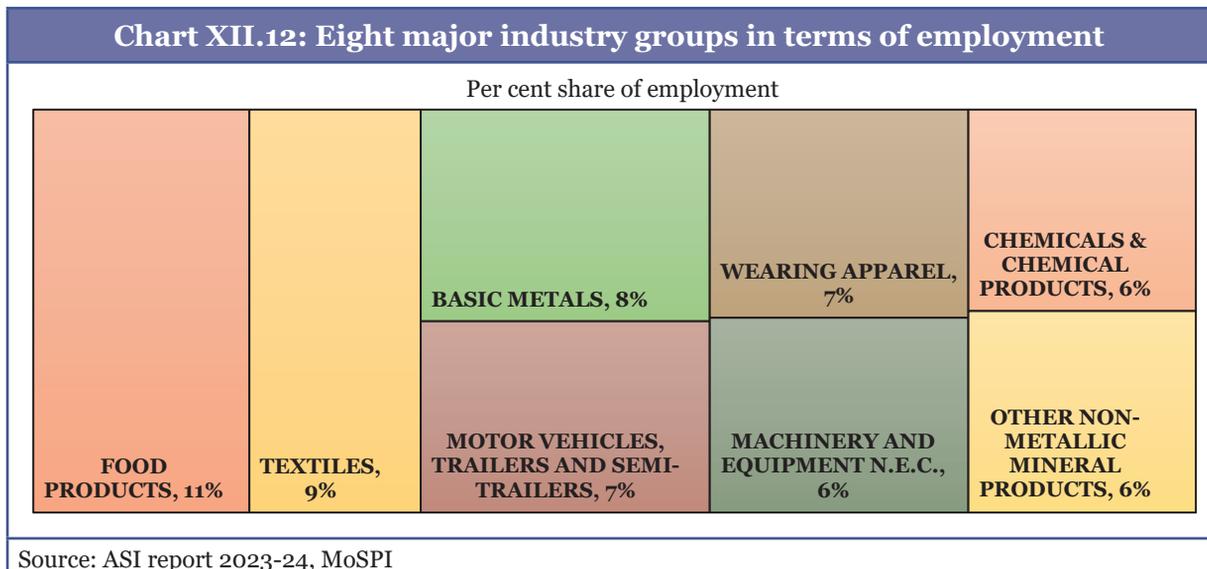
12.23 While employing a larger share of the manufacturing workforce, large factories (employing more than 100 workers) also pay higher wages and have a higher NVA per person engaged, signalling higher labour productivity in larger factories.

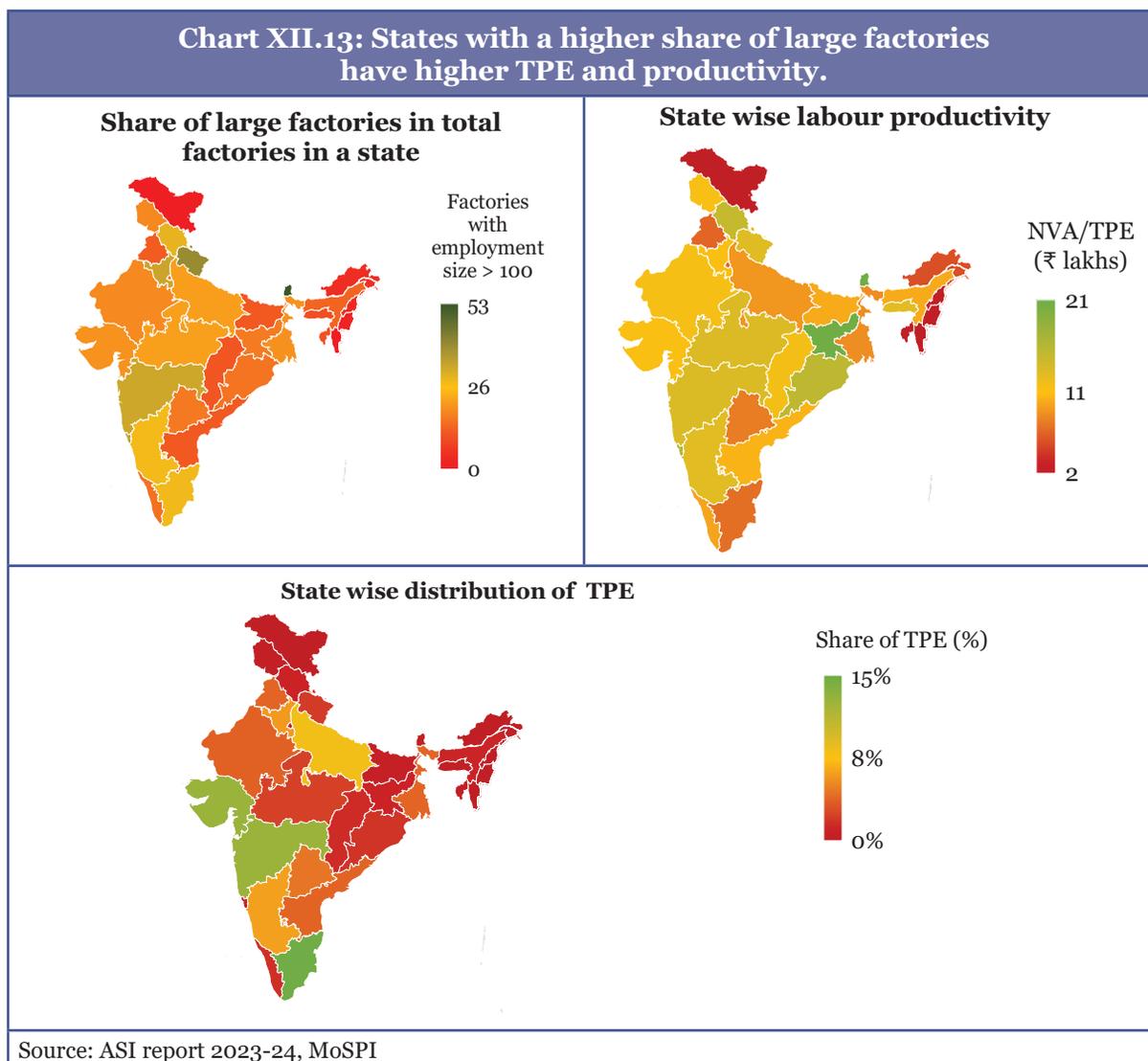


12.24 Compared to a 26 per cent increase in the number of smaller factories, the number of large factories has almost doubled over the last decade (increasing by 97 per cent between FY14 and FY24). Thus, in terms of total persons engaged (TPE), employment has been rising in larger factories at a CAGR of 6 per cent compared to a CAGR of 2 per cent in smaller ones. This represents an improvement in employment quality, as large factories are associated with higher wages and greater worker productivity.



12.25 In terms of geographic distribution, seven states contributed to around 60 per cent of the total employment in the manufacturing sector with Tamil Nadu (15 per cent) on top followed by Gujarat (13 per cent), Maharashtra (13 per cent), Uttar Pradesh (8 per cent), Karnataka (6 per cent), Haryana (6 per cent) and Telangana (5 per cent). States like Maharashtra, Madhya Pradesh, Tamil Nadu, Himachal Pradesh, Haryana, Uttarakhand, Karnataka and Uttar Pradesh displayed a higher share of larger factories. These states also registered a high productivity in terms of NVA per person engaged. Further, eight industry groups in the organised manufacturing sector contributed to around 60 per cent of the total employment (Chart XII.12).





## Jobs in the unincorporated sector

12.26 According to the QBUSE, the unincorporated non-agricultural sector comprises a total of 7.9 crore establishments, employing 12.9 crore individuals.<sup>44</sup> The share of working owners<sup>45</sup> among total employed workers in the sector increased from 58.9 per cent in 2023-24<sup>46</sup> to 60 per cent in Q2 FY26, indicating a shift towards self-employment and entrepreneurial activities. The rural workforce in the sector was six crore in Q2 FY26, indicating the significant contribution of unincorporated enterprises to rural economic activities. Additionally, women represent 28.7 per cent of the workforce in the sector. The increasing trend of digitisation in the unincorporated non-agricultural

44 QBUSE July to September 2025: <https://tinyurl.com/p769y4a9> QBUSE presents key estimates at more frequent intervals based on data collected during the quarters covered by ASUSE.

45 Working Owners are individuals who own and operate their unincorporated businesses, and either work in them themselves or are involved in their management.

46 Annual Survey of Unincorporated Sector Enterprises (ASUSE) 2023-2024 (October 2023 – September 2024). <https://tinyurl.com/48xrv97w>

sector is reflected in the rising use of the internet among business units, which increased steadily from 26 per cent in 2023-24 to 39 per cent in Q2 FY26.

### Boosting manufacturing workforce participation

12.27 The manufacturing sector is critical for national self-reliance and strategic resilience, serving as a central pillar of India's growth and strengthening its role in global value chains. Competing globally requires not only capital and technology but also a focus on labour, including worker well-being, gender inclusivity, and harnessing the demographic dividend. Labour is crucial to the sector's expansion, with 11.4 per cent of total employment in the manufacturing sector in 2023-24.<sup>47</sup> About 1.9 crore persons are employed in the organised manufacturing sector<sup>48</sup>, while about 3.3 crore persons are employed in the unorganised manufacturing sector.<sup>49</sup> Enhancing worker participation is essential for enhancing productivity and sustainable long-term growth.

12.28 Evidence from civil society-private sector partnerships shows that targeted interventions in worker well-being drive both business competitiveness and national prosperity. Some of these interventions are discussed in **Box XII. 3**.

#### Box XII.3: Building a resilient and productive workforce

Workplace conditions play a critical role in shaping workers' well-being and productivity. For factory workers, the time spent at the workplace is defined not only by hours of work but also by the quality of working conditions and the availability of adequate space for work and living. Migrant workers manage all these pressures while living and working in a foreign environment. In this context, it is essential for employers to provide a conducive working environment that enhances worker engagement in the tasks assigned to them.

To foster a holistic approach to workforce welfare, interventions focusing on three critical dimensions of employee well-being: financial, mental, and physical health, can play a key role in improving overall productivity.

**Mental well-being through the 'buddy' system:** Many women migrate to urban manufacturing hubs for employment. While this offers financial gains, many individuals face loneliness and social isolation, which negatively impact their mental well-being and productivity at work. This can also lead to high early attrition, representing lost gains for workers and increased costs for employers. Evidence suggests that strong social connections

47 Annual PLFS 2023-24 (July 2023-June 2024): <https://tinyurl.com/mt4w3ja4>

48 ASI 2023-24 (FY24): <https://tinyurl.com/ycxvk3w8>

49 ASUSE 2023-24 2024 (October 2023 – September 2024): <https://tinyurl.com/bde7j564>

reduce anxiety, loneliness, and depression, thereby improving an individual's ability to adapt, engage, and remain in their employment.<sup>50,51,52</sup>

To address the social drivers of retention for new migrant workers, a study was conducted (from January 2023 to December 2024) by pairing new migrant women workers in factories in Bangalore with experienced peers or 'buddies' who share a similar language and background. Buddies were trained in basic cognitive-behavioural techniques to provide emotional first-aid and help newcomers navigate workplace and community life. This simple, low-cost intervention demonstrated remarkable success, showing a 5.3 per cent reduction in anxiety and a 5.9 per cent reduction in depression among workers. From the firm's perspective, while there was a marked productivity increase of 6.4 per cent among new workers, paired with a senior buddy, a more surprising 12 per cent increase in worker productivity was observed among senior buddies.<sup>53</sup>

**Financial well-being with earned wage access (EWA):** EWA, also known as on-demand pay, is a service designed to meet the immediate short-term liquidity needs of workers. It allows users to access part or all of their wages as they earn them, before their next scheduled payday. Financial stress among workers can be a significant barrier to productivity. Research shows that financial pressures reduce cognitive bandwidth and are nearly five times more likely to be a source of distraction at work.<sup>54,55,56</sup> To address this, an EWA intervention could help manage financial stress, improve employee retention and worker welfare.<sup>57</sup> Evidence from a randomised controlled trial (RCT) from March 2023 to October 2024, involving over 800 women workers, found that access to liquidity led to substantial gains in well-being. The study found a reduction in high-interest informal borrowings, alongside a 20 per cent decline in the likelihood of workers forgoing essential expenditures. This improved financial stability resulted in a reduction in worker turnover

50 Weziak-Bialowolska et al (2022) Prospective Associations Between Social Connectedness and Mental Health. Evidence From a Longitudinal Survey and Health Insurance Claims Data. *Int J Public Health*. 2022 Jun 9;67:1604710. doi: 10.3389/ijph.2022.1604710 <https://tinyurl.com/swzwfays>

51 World Health Organization. (2025). From loneliness to social connection: Charting a path to healthier societies <https://tinyurl.com/bdfu4evc>

52 Battling anxiety and depression among migrant workers: Increasing peer support for migrant garment workers improved mental health and productivity. Good Business Lab (GBL) (2024). <https://tinyurl.com/4nc4hk2d>

53 The experiment was conducted by the Good Business Lab as a pilot study in 14 garment factory units in Bengaluru with 1,098 participants over the period of eight weeks.

54 Mani et al. (2013). Poverty impedes cognitive function. *Science*, 341(6149), 976–980. <https://doi.org/10.1126/science.1238041>

55 PWC (2023) Employee Financial Wellness Survey: Guiding your employees through uncertain economic times. <https://tinyurl.com/y6wfnp4h>

56 Earned wage access: Facilitating early withdrawal of earned wages can transform household finances for blue-collar workers. Good Business Lab. <https://tinyurl.com/cm4ns6x3>

57 Murillo et al. (2025) Fintech to the (Worker) Rescue: Earned Wage Access and Employee Retention <http://dx.doi.org/10.2139/ssrn.4067701>

and an increase in worker productivity, positioning financial well-being as a factor yielding clear returns for both employees and employers.<sup>58</sup>

**Physical well-being through sexual and reproductive health (SRH) awareness:**

The physical well-being of women workers is often impacted by low awareness and social norms surrounding SRH, which limit their access to information and care. This can be addressed through a capacity-building programme at the workplace. Evidence suggests that SRH training can improve general health behaviours and result in a higher rate of contraceptive use. Notably, there was also a significant increase in the reporting of sexual harassment experienced in public spaces, reflecting greater awareness and confidence.<sup>59</sup> These models demonstrate the effectiveness of workplace-based programs in overcoming information barriers, offering a scalable pathway to improve women's health and well-being.<sup>60</sup>

These examples demonstrate that a focus on holistic well-being (mental, financial, and physical) creates a more resilient, secure, and productive workforce. Such a foundation of a supported and healthy workforce is a critical prerequisite for tackling broader national priorities, such as increasing women's participation in manufacturing sectors, and ensuring India's industrial growth is both sustainable and inclusive.

## CATALYSING JOB GROWTH

12.29 The four Labour Codes- Code on Wages 2019, Industrial Relations Code 2020, CSS and Occupational Safety, Health and Working Conditions Code 2020 have consolidated 29 central laws to streamline regulations and extend protections to workers. The implementation of these Codes was notified on 21 November 2025. The Codes have attempted to strike a balance between regulation and flexibility, while protecting worker rights and ensuring social security for workers. They are a result of the deliberations held in the tripartite meeting of the government, employers, industry representatives, and various trade unions from 2015 to 2019.<sup>61</sup>

12.30 The Codes have introduced formal recognition for gig workers (CSS) (Sections 2(35) & 2(60)), mandatory appointment letters for all (Occupational Safety, Health and Working Condition Code, 2020), portable social security for migrant workers (CSS), equal benefits (including gratuity and leave after one year) for fixed-term and contract

<sup>58</sup> The study was conducted by GBL. GBL developed a simple, Android-based tablet application for the workplace, which enabled workers to withdraw their earned wages via direct transfer to their bank account with just a few taps. It also conducted an RCT with 408 women in the treatment group and 426 women in the control group, along with baseline, midline, and endline surveys to assess the state of household finances. Furthermore, GBL analysed worker-level administrative data, including tenure, daily attendance, wages, and output, as well as an analysis of EWA tool utilisation, including per-worker transaction frequency and transaction size.

<sup>59</sup> GBL (2025). Sexual and reproductive health program. <https://tinyurl.com/ycy3s9kh>

<sup>60</sup> The Programmes | Sexual Reproductive Health Training. (2021). UNFPA. <https://tinyurl.com/fdcz4bpz>

<sup>61</sup> PIB release dated 21 November 2025: <https://tinyurl.com/2s7er4sa>

workers, a minimum wage, and timely payments, as well as a national floor wage (Code on wages, 2019). The simplified compliance with a single licence for contract staffing is poised to accelerate formalisation and inclusive growth.

12.31 Complementing the roll-out of the Centre's Labour Codes, 32 states/UTs have published draft rules under the Codes. Notably, the Uttar Pradesh (UP) government has recently notified new rules allowing women to work night shifts, provided they are accompanied by mandatory safeguards, including employer-provided transportation, health facilities, CCTV surveillance, security personnel, and double wages for overtime work. The quarterly overtime cap has been raised to 144 hours.

12.32 In UP, the amendment to the Factories Act, 1948, enables women to work in all 29 hazardous sectors, promoting gender equality, industrial modernisation, and increased female workforce participation. The reform is supported by enhanced safety infrastructure, including helplines, police beats, and dedicated anti-harassment squads.<sup>62</sup>

12.33 Implementing the Codes marks the first step towards the labour market transformation. The transition will require coordination and investment from the private sector. Companies must enhance their systems, update policies, reevaluate workforce models, and improve their digital readiness to remain competitive. While the Codes offer a unified framework, it is up to the private sector to integrate this framework into daily operations. The impact of the Labour Code on the labour market is discussed in **Box XII.4**.

#### Box XII.4: Economics of the Labour Codes

Labour is a concurrent subject in the Constitution of India, and until recently was regulated by more than 140 laws (Central and State) with overlapping jurisdictions and inconsistent definitions.<sup>63</sup> The multiplicity of laws led to difficulties in compliance and multiplicity of authorities in different labour laws, leading to complexity and difficulty in enforcement. This resulted in a complex regulatory framework, underscoring the need for a flexible, streamlined and efficient reform to encourage entrepreneurship, support firm growth, and promote productive employment.

Government regulatory measures are as influential in resource allocation as the invisible hand of the market. Empirical studies highlight the policy trade-offs between labour market flexibility and regulation, showing that while regulations protect workers from exploitation,

<sup>62</sup> The Factories (Uttar Pradesh Amendment) Act, 2024. Gazette notification No. 185(2)/LXXIX-V-1-2025-1-ka-17-2024 Dated 3 October 2025

<sup>63</sup> Confederation of Indian Industry. (July 2025). Policies for a competitive India: CII recommendations. <https://tinyurl.com/2fxp9f5p>

overly rigid policies may reduce investment, employment, productivity, and output in registered manufacturing, and encourage informal sector activities.<sup>64</sup> Supporting this, another study conducted in 2025, evaluating the impact of state labour law reforms in India on employment, output, new industrial units, investment, and unit sizes, found that inflexible labour laws led to slower growth of large industrial units and fewer regular jobs. States with flexible labour laws show significantly higher employment, fixed capital, and output compared to those with inflexible laws.<sup>65</sup>

Thus, amid external headwinds, India's push for global competitiveness hinges on reforms that simplify business processes and labour regulations. The government's step to consolidate 29 central laws into four comprehensive Labour Codes would simplify compliance, update outdated provisions, and create a streamlined, effective framework that enhances ease of doing business while protecting workers' rights and welfare.

**Impact on female labour force participation:** Research shows that fewer restrictions correlate with a lower female unemployment rate, higher FLFPR, more women in management roles, and a smaller wage gap compared to states with stricter restrictions on women's labour.<sup>66</sup> Further, removing legal restrictions on women's employment benefits women and economies. Allowing women to work at night is associated with a higher likelihood of women becoming top managers.<sup>67</sup> The new Labour Codes enable women to work across all establishments, including those with night shifts, with the necessary safety measures in place. They promote gender equality through equal wages<sup>68</sup>, provision of creches<sup>69</sup>, flexibility through work-from-home provision<sup>70</sup> and expansion of maternity benefits<sup>71</sup>, thereby supporting higher participation in the workforce. According to the Indian Staffing Federation estimates, the gender provisions, including consensual night work, could elevate FLFPR to 33.7 per cent.

**Impact on formalisation:** The Labour Codes mandate the issuance of appointment letters for all, with the provision of equal benefits (including gratuity after one year) for fixed-term and contract workers, and a single pan-India registration/license/return, thereby reducing redundancy and the compliance burden. The provision of the National Floor Wage ensures

64 Besley, T., & Burgess, R. (2004). Can Labour Regulation Hinder Economic Performance? Evidence from India. *The Quarterly Journal of Economics*, 119(1), 91–134. <https://tinyurl.com/72f7xsz3>

65 Debroy, B., De, S., Aditya, Dudani, C., & K. R., J. (2025). Impact of state-level labour law reforms in India: an empirical analysis. *Journal of the Asia Pacific Economy*, 30(4), 1199–1227. <https://tinyurl.com/54ukd9t5>

66 Anand, B., and Kaur, S. (2022) State of Discrimination Report: Sub-national comparison of legal barriers to women's right to choose work in India. New Delhi: Prosperiti. <https://tinyurl.com/2xejvd6h> The report presents a comparison of 23 Indian states on the extent of sex-based legal discrimination using 48 Acts, 169 Rules, and 20 Notifications/Orders.

67 Islam et al. (2019). Unequal Laws and the Disempowerment of Women in the Labour Market: Evidence from Firm-Level Data. *The Journal of Development Studies*, 55(5), 822–844. <https://tinyurl.com/ykma5ab5>

68 Section 3, Code On Wages, 2019

69 Sec. 67, CSS 2020

70 Section 60(5), CSS 2020

71 Sec. 60, CSS 2020

uniformity and adequacy nationwide, while the traditional role of ‘Inspector’ is replaced with ‘Inspector-cum-Facilitator,’ emphasising guidance, awareness, and advisory roles alongside enforcement to improve compliance (Code on Wages, 2019). In addition, recognising fixed-term employment (FTE) as a formal engagement could benefit MSMEs in particular by allowing them to hire workers for seasonal or project-based needs without committing to long-term employment and incurring overhead costs. It would promote direct hiring over a contractual one. According to a study by SBI, the implementation of labour laws can increase the formalisation in the economy from 60.4 per cent to 75.5 per cent.<sup>72</sup>

**Impact on employment:** The SBI projects medium-term employment gains of 1.0–2.2 per cent in the organised sector through the implementation of the Labour Codes, resulting from reduced compliance costs and expanded formal hiring, though short-term frictions are likely. This can lead to a reduction in UR, bringing it down to 1.9- 2.9 per cent and generating ~77 lakh jobs. Overall, post-transition, unemployment could decrease by 0.3-1.3 per cent, depending on the implementation, firm costs, and state policies. Simplified processes lower costs for SMEs, enabling scalability, and promote gender-neutral policies (e.g., night shifts for women), thereby expanding talent pools. Compliance simplification is expected to reduce costs by 30-40 per cent, fostering SME hiring.<sup>73</sup> With the higher thresholds for layoff, retrenchment, and closure under the Industrial Relations Code, incentives for firms to remain small have been reduced. Direct hiring, including FTE, aligns workers with organisational goals and encourages employer investment in training, boosting productivity and increasing hiring.

**Expansion of social security:** CSS mandates aggregators' contribution to 1-2 per cent of annual turnover (capped at 5 per cent of worker payouts) to fund life/health insurance, as well as pensions for gig workers, potentially covering 2.35 crore workers by 2030. Portable benefits via UAN ensure interstate mobility, which is vital for the migrant gig workers. These Codes balance worker rights with business ease. For example, Industrial Tribunals expedite disputes (from years to months), and the Wages Code's floor wage (₹178-500 daily) standardises earnings, curbing exploitation.

**Impact on incomes and growth:** These reforms address key challenges, such as income volatility and benefit gaps, potentially contributing 1.25 per cent to GDP by 2029-30 through enhanced worker welfare and business agility.<sup>74</sup> SBI estimates that the implementation of the ‘Code on Wages’ would increase the disposable income of workers and has the potential to boost consumption by approximately ₹75,000 crore, in turn enhancing economic growth.

Thus, the newly notified Labour Codes hold particular promise for boosting female LFPR, enhancing employment and formalisation, spurring inclusive growth and productivity amid India's demographic dividend.

<sup>72</sup> State Bank of India. (25 November 2025). Ecowrap: <https://tinyurl.com/mtmcdzsy>

<sup>73</sup> Indian staffing federation

<sup>74</sup> Ibid note 73 above

## Gig economy and informal workforce dynamics

12.34 India's labour market is transforming due to factors such as economic policies, technological progress, and the evolving demands of the labour market. As a result, traditional employment paradigms are yielding to hybrid models that blend contract and formality. These factors also shape the way key players in the labour market interact, specifically the employer and the employee. The changing dynamics of this interaction occur in the context of the preferences of these two agents, where one wants to maximise its revenue and minimise cost, and the other wants to maximise its pay.

12.35 The employer-worker relationship is shaped by factors such as the directness of the employer-employee connection (bipartite or tripartite), the nature of work (ongoing or task-based), the terms and frequency of payment, the work location and hours, and access to benefits such as social security or paid leave. Understanding these features is crucial for identifying the diverse categories of workers in India, which range from permanent and regular employees to casual, contract, self-employed, and gig workers and is essential for framing policies that ensure economic security and fair treatment for all in a changing labour market. With the growth of the gig economy, these features are evolving further: jobs are more flexible, payments are digital, and traditional employer-employee interactions are less defined.

**Table XII.1: Features of the work relationship**

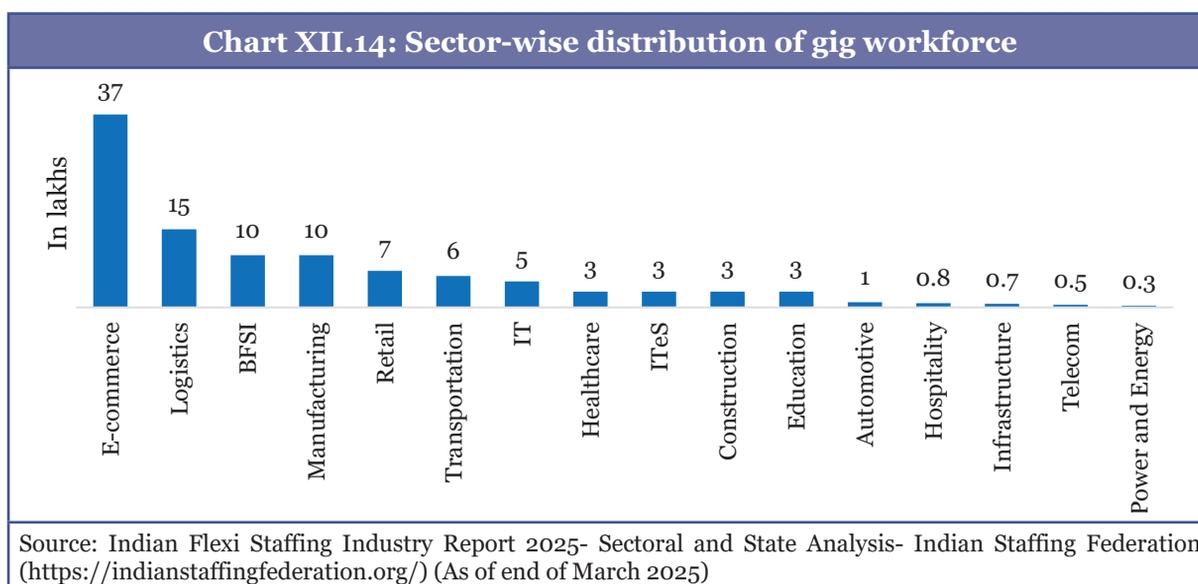
	Regular wage/ Salaried	Casual	Self-employed	Gig/ platform worker	Fixed-term/ Contract Workers
<b>Employer-worker connection</b>	Direct (Bipartite)	Direct	No employer	Via digital platform (Tripartite)	Bipartite or Tripartite
<b>Nature of work</b>	Ongoing	Casual/ Seasonal	Ongoing	Task Based	Ongoing
<b>Payment</b>	Fixed	Daily	Profits	Task based	Fixed
<b>Work location</b>	Specific	Specific	Self-determined	Self-determined	Specific
<b>Hours</b>	Fixed	Demand based	Self-determined	Self-determined	Fixed
<b>Social Security</b>	Yes	Not covered	Not covered	Not covered	Mixed
<b>Leave</b>	Paid Leave	No paid leave	Self-determined	No formal paid leave	Mixed

Source: Author's formulation based on various reports<sup>75</sup>

<sup>75</sup> PLFS definition; ILO 2025 report on gig economy (<https://tinyurl.com/49e39z7a>) & Indian Flexi Staffing Employment Trends Annual Report 2025 <https://indianstaffingfederation.org/>

12.36 In general parlance, gig work refers to short-term, task-based or project-based work carried out on a freelance or independent basis, often mediated through digital platforms. According to the ILO, gig work is typically performed by self-employed or independent contractors who obtain clients and projects through online platforms or applications and are paid upon completion of tasks or projects rather than receiving a regular wage.<sup>76</sup> Due to its task-based and independent nature, gig work offers flexibility by allowing workers to choose when, where, and how much they work, making it particularly attractive to those seeking to balance employment with personal responsibilities such as caregiving or education.

12.37 Against this backdrop, the recent developments in digital platforms and policy reforms are reshaping work structures, fostering flexibility while promoting formalisation. Gig workers continue to engage on a task-by-task basis with flexible hours and pay. The gig economy, encompassing delivery, ridesharing, and freelancing, has witnessed structural growth, transitioning informal jobs into ecosystem-integrated roles. From 77 lakh workers in FY21, the sector witnessed a 55 per cent increase to 120 lakh workers in FY25, driven by smartphone penetration among over 80 crore users and 15 billion UPI transactions per month. Now representing over 2 per cent of the total workforce in India, growth of gig workers outpaces overall employment, with non-agricultural gigs projected to constitute 6.7 per cent of the workforce by 2029-30, contributing ₹2.35 lakh crore to GDP.<sup>77</sup>



12.38 While the gig economy is booming, income volatility persists, leading to challenges in accessing credit. Financial inclusion also lags behind for gig workers. They have

<sup>76</sup> Exploring the gig economy: Challenges and opportunities (ILO 2025) <https://tinyurl.com/49e3927a>

<sup>77</sup> <https://indianstaffingfederation.org/>

‘thin-file’ credit access, which remains a concern.<sup>78</sup> Platform algorithms control work allocation, performance monitoring, wages, and supply-demand matching, raising concerns about algorithmic biases and burnout. About 40 per cent of gig workers report earnings below ₹15,000 per month.<sup>79</sup> Limited skilling and fears of job losses due to technological advances such as artificial intelligence (AI) and machine learning (ML) add to worker vulnerability. Chapter 14 of the Economic Survey provides a detailed examination of the implications of the AI ecosystem for India. Strengthening social security, such as provident fund, insurance, and maternity benefits for this sector, is essential.

12.39 As the gig economy expands, its impact on employment and economic growth will become increasingly evident. While it offers unprecedented opportunities for revenue creation and economic diversification, addressing its challenges is crucial to ensuring long-term and equitable growth. The Labour Codes have formally recognised gig and platform workers, expanding social security, welfare funds, and benefit portability.<sup>80</sup> Going forward, ensuring algorithmic transparency and promoting worker-friendly practices will be crucial, as highlighted in Box XII.5.

**Box XII.5: Balancing regulation and flexibility:  
The new frontiers of the gig workforce**

The gig economy is reshaping the labour market by changing the nature of employee-employer relations. Gig workers are often classified as ‘freelancers’, ‘independent contractors’ or platform partners’, making it difficult to apply conventional labour market definitions and regulations. When classified this way, gig workers lack employment benefits such as social security, paid leave, minimum hours, and health coverage, resulting in poor job security and lower incomes. This is precisely where policy intervention is essential, and the CSS steps in by formally recognising gig and platform workers and providing for social security schemes for them.<sup>81</sup> Chapter I, Section 2(35) of the CSS defines a gig worker as ‘*a person who participates in a work arrangement and earns from such activities outside of a traditional employer–employee relationship.*’ It also defines aggregators as digital intermediaries that connect service providers with consumers.<sup>82</sup>

Globally, regulations related to the gig economy are becoming increasingly tightened. In 2021, Spain introduced the ‘ley rider’ (rider law), recognising food courier workers as employees

<sup>78</sup> A thin-file credit access refers to individuals with insufficient credit history for traditional lenders to assess risk, making it harder for individuals to access credit or secure favourable terms.

<sup>79</sup> Ibid note 77 above

<sup>80</sup> Code on Social Security, 2020 (Sections 2(35) & 2(60))

<sup>81</sup> Chapter I, Section 2(35) of the CSS defines a gig worker as ‘a person who participates in a work arrangement and earns from such activities outside of a traditional employer–employee relationship.’

<sup>82</sup> Chapter I, Sec. 2(2), Sec. 2(35), Sec 2(61) and Sec 2(60) of the CSS.

rather than self-employed contractors, and establishing rules for the use of algorithms in the workplace.<sup>83</sup> The European Union Platform Workers' Directive (2024) was implemented to correct the employment status of gig workers who are misclassified as self-employed, improve transparency, and regulate the use of algorithms and data in decision-making processes involving platform workers.<sup>84</sup> In 2025, the ILO initiated formal discussions on establishing international standards for decent work in the platform economy, with a focus on fair wages, working conditions, and social protections.<sup>85</sup> Over the years, cities such as Seattle<sup>86</sup> and New York<sup>87</sup> have implemented worker protections, including anti-retaliation measures, deactivation appeals, and minimum wage laws, for app-based workers.

Historically, in India, gig and platform workers have been classified as informal labour, often not covered by existing labour laws. The CSS provides legal acknowledgement to these workers and lays the foundation for establishing their rights and protections.

While the law recognises gig and platform workers as a distinct category, it treats them as a largely homogeneous group, whereas in practice the workforce is highly segmented by skill. According to a NITI Aayog report, the share of high-skilled gig workers is expected to be 27.5 per cent by 2030, while for low-skilled workers, it is projected to be 33.8 per cent by 2030.<sup>88</sup>

McKinsey categorises gig workers in the US and EU into four categories based on income reliance and preference.<sup>89</sup> These included i) Free agents (primary income and prefer gig work); ii) Casual earners (gig work for supplementary income or skills); iii) Reluctants (rely on gig work but prefer regular jobs), and iv) the financially strapped (gigs to make ends meet). While preferences shape the labour supply of gig work, demand is driven by task type and skill level, ranging from low-skill-high turnover (jobs like retail, food service, etc) to middle-skilled generalists (e.g., taxi drivers, beauticians) and highly specialised professionals (e.g., programmers, physicians, lawyers) serving multiple employers. Policy should aim to move gig workers from categories 'iii' and 'iv' to 'i' and 'ii', making gig work a choice rather than a necessity. The CSS formally recognises gig workers; policy should now prioritise upward mobility of low-skilled workers through upskilling, move into better-paying jobs, and make gig work a stable, reliable income source.

Another major challenge for gig workers is limited access to credit and productive assets needed to move into better gigs. Many cannot upgrade from low- to medium-skilled gigs

83 Spain's rider law. <https://tinyurl.com/mrxw3jyu>

84 Directive (EU) 2024/2831 of the European Parliament: <https://tinyurl.com/bdzvj7mh>

European Parliament. Gig economy: How the EU improves platform workers' rights. <https://tinyurl.com/4x5f4bv8>

85 Decent work in the platform economy (ILO, 2025). <https://tinyurl.com/ykecu9zw>

86 Seattle, Office of Labour Standards (2025): <https://tinyurl.com/mrxbn88w>

87 New York City council (2025): <https://tinyurl.com/fh9p5xmw>

88 NITI Aayog. (2022). India's booming gig and platform economy: Perspectives and recommendations on the future of work: <https://tinyurl.com/chct6udx>

89 Manyika et al. (2016). Independent work: Choice, necessity, and the gig economy. McKinsey Global Institute. <https://tinyurl.com/3tnvswyv>

because they lack tools (for example, a bike, car, or specialised equipment). Encouraging platforms and employers to co-invest in assets and training could help workers progress into more secure, higher-quality jobs.<sup>90</sup> It is important to help gig workers manage unstable incomes. They require basic financial planning support, including access to low-cost emergency savings schemes, portable social security benefits, and budgeting or financial-literacy programmes. The market should be encouraged to offer more flexible and agile financial products that consider the income patterns of gig workers.

Platforms have become essential gig-market infrastructure for finding workers and work. This concentration of power raises concerns over fees, algorithms, and worker protections. Policy should address this through competition rules, data access, and algorithmic transparency, while reorganising the social contract so that gig work benefits workers more fairly. Policy can reduce the cost gap between regular and gig work by limiting incentives to avoid mandatory benefits and by setting minimum per-hour or per-task earnings (including waiting time), encouraging formal employment and raising incomes for low- and medium-skilled gig workers. Taken together, the goal of gig-economy policy should be to reshape the terms so that workers exercise real choice rather than being pushed into gigs due to weak demand, skill mismatch, or the absence of a safety net.

## SKILL ECOSYSTEM OVERVIEW

12.40 Expanding access to skills and improving their quality requires a well-integrated skilling ecosystem. Skills policy sits at the crossroads of education, labour markets, and industry, making close coordination and collaboration essential among a broad range of stakeholders, including multiple institutions, ministries, government at various levels, students, educators, workers, employers, trade unions, and other relevant actors. As India seeks to harness its demographic dividend and respond to evolving labour market needs, a well-integrated and forward-looking skilling system is critical to enabling the workforce to capitalise on emerging economic opportunities.

12.41 The PLFS 2023-24 findings show that the share of individuals (in the 15–59 age group) having acquired some form of vocational or technical training has increased from 8.1 per cent in 2017-18 to 34.7 per cent in 2023-24, reflecting the positive impact of skilling initiatives in India.<sup>91</sup> However, there is a need to expand access to formal skilling as only 4.9 per cent of the youth (in the 15-29 age group) have received formal vocational or technical training, while another 21.2 per cent received training through informal sources. Estimates from a 2025 study suggest that a 12-percentage-point increase in skilled workforce through investment in formal skilling could lead to more

<sup>90</sup> Ibid note 88 above.

<sup>91</sup> Annual PLFS report 2023-24.

than a 13 per cent increase in employment in the labour-intensive sectors by 2030.<sup>92</sup> This highlights the need to expand the coverage of skill training programmes while ensuring quality and alignment with market demands.

12.42 As India's skill landscape expands with a growing working-age population, skilling programmes need to work together in a mutually reinforcing way. Internationally, countries are shifting towards a whole-of-government approach in skilling that enables coordination across ministries ('horizontal coordination') and across different levels of government ('vertical coordination'). Many countries have adopted inter-ministerial platforms and unified governance arrangements to enhance coherence while maintaining flexibility for regional and sectoral priorities.<sup>93,94</sup>

12.43 The Ministry of Skill Development and Entrepreneurship (MSDE) serves as the nodal body for national skill development, along with many sectoral skilling schemes being designed and implemented independently by other ministries. This presents an opportunity for convergence through uniform standards, guidelines, shared platforms, and coordinated planning, which can reduce duplication, streamline implementation, optimise resource utilisation and enable programmes to operate in a complementary manner. Enhanced coordination across ministries and levels of government would enable the diverse skilling initiatives to improve employability, expand coverage, and better equip the workforce for technological and economic changes.

12.44 In this regard, the SIDH of the MSDE represents a major governance reform by providing a centralised information hub for all government initiatives in the domains of skill, education, employment, and entrepreneurship, all in a single portal.<sup>95</sup> SIDH meets the diverse skilling needs of the labour market by offering digital skilling through a learning management system, portable verified credentials and multilingual options to ensure inclusivity. It also brings together skilling programmes across central and state governments, allowing citizens to choose from multiple skilling options based on their preferences. It has streamlined processes such as registration, course delivery, credentialing, and job matching, thus reducing duplication across schemes and improving administrative efficiency. SIDH data enhances the monitoring of training quality and outcomes, supporting evidence-based policy decisions.<sup>96</sup> The integration of

92 National Council of Applied Economic Research. (2025). India's employment prospects: Pathways to jobs: <https://tinyurl.com/578vpbu7>

93 OECD. (2020). Strengthening the governance of skills systems: Lessons from six OECD countries. OECD <https://tinyurl.com/bd4r49rx>

94 OECD. (2019). OECD skills strategy 2019: Skills to shape a better future. <https://tinyurl.com/3ac35uxz>

95 PIB release of Ministry of Skill Development and Entrepreneurship dated 7 August 2024: <https://tinyurl.com/yytj43va>

96 Bhatnagar, A. (2024). Digitally skilling India: The SIDH implementation journey—Approach & solution (Case study). National e-Governance Division (NeGD), Ministry of Electronics & Information Technology. <https://tinyurl.com/5y5upktr>

industry-aligned courses, including those linked to Industry 4.0, directly connects skill training with labour-market demand.

12.45 Along with enhancing horizontal and vertical coordination, it is also essential to redesign the policies to address the evolving needs of the labour market. There is a need to shift the focus from outputs, such as the number of programmes and enrolments, towards outcomes in terms of employability, improved earnings, and job quality (Box XII.6).

#### Box XII.6: Making skilling ‘work’ for upskilling and employability

The central challenge in India’s skilling landscape is not the absence of training effort but the weak translation of training into durable labour-market value. Making skilling truly work requires a shift in both mindset and mechanics: from producing trained persons to producing workers whose skills are valued, verified and retained.

The first step is to **re-anchor incentives around outcomes and retention**. Training providers, intermediaries and even public agencies respond to the signals that funding and compliance systems send them. If payments, renewals and reputational credibility are tied primarily to numbers trained, the rational behaviour of the system will be to maximise throughput. If contracts and empanelment hinge on verified employment starts, six- and twelve-month retention, and evidence of earnings uplift relative to the baseline, the system begins to reorganise itself around placement quality, realistic counselling, closer employer partnerships, and post-placement support. This reframing also influences course choices: modules that consistently fail to lead to jobs or apprenticeships are no longer attractive to providers and are gradually removed from the portfolio. The section on innovative financing mechanisms builds on this approach by examining outcome-based instruments such as skill impact bonds of the National Skill Development Corporation (NSDC) and skill vouchers.

A second ingredient is to **treat employer linkage as a core design feature rather than an add-on**. Skilling programmes perform best when employers are involved at three key points: in shaping curricula so that skills align with actual tasks and equipment, in creating workplace learning opportunities through apprenticeships or internships, and in jointly participating in assessment, ensuring that certification signals competence rather than attendance. This is especially important in India’s labour market, which remains dominated by small and informal firms with limited human resource capabilities; without such linkage, trainees may complete courses only to discover that their skills are either mismatched or undervalued. The section titled ‘Supply-Driven to Industry-Driven Skilling’ elaborates on how skill initiatives in India are strengthening these linkages.

Third, **local labour market intelligence must inform course portfolios**. The failure of many skilling efforts lies less in the quality of training than in an inappropriate mix of courses relative to district-level demand. A dynamic mapping of vacancies, investment pipelines, migration corridors and sectoral shifts can inform which roles merit expansion and which should be sunset. Short, stackable modules that allow workers to accumulate

capabilities over time, including through recognition of prior learning, can support mobility and wage progression rather than creating a brittle one-shot credential.

Fourth, **placement must be professionalised as a service**. Counselling that clarifies aptitude, wage expectations and likely job locations is essential to avoid disillusionment and premature quitting. Verified interview pipelines, job fairs with real openings, and mobility support for inter-district or inter-state placements can materially improve retention. In many cases, small frictions, such as the cost of relocation, a lack of accommodation, or weak social support, undermine otherwise sound training-to-job transitions. Acknowledging and addressing these realities is part of making skilling effective.

Fifth, the credibility of the entire enterprise depends on **integrity in attendance, assessment and verification**. When ghost centres, inflated numbers or weak assessments creep in, they erode trust among employers, trainees and the public, and crowd out more sincere providers. Strong digital attendance with audit trails, third-party assessment integrity checks and transparent grievance redress processes are not administrative niceties; they are foundational to establishing the signal value of a certificate. The section titled 'From challenges to accountability via skilling scorecard' highlights the importance of strengthening assessment and accountability frameworks in the skill ecosystem.

Within this broader effort to improve employability, the question arises whether **upgrading Industrial Training Institutes (ITI) diplomas into bachelor-level degrees** would help to make vocational pathways more attractive and valued. There are two distinct effects to consider. On the positive side, degree-equivalent recognition can enhance the reputation and social prestige of vocational tracks in a country where families often equate degrees with status and opportunities. It may also enhance academic mobility, enabling lateral entry into higher education, professional certifications or engineering pathways that were previously closed to vocational graduates. For some trainees, this can reduce the perceived risk of choosing a skills-first route. **Box XII.9** highlights the success of Odisha's skill development initiatives in strengthening ITIs and short-term training programmes by reshaping perceptions around skilling, offering a replicable template for other states.

A prudent approach is to view the **degree upgrade as a complementary instrument**, not a substitute for outcome-oriented reform. Where ITI programmes already demonstrate strong employer linkage, workplace learning and high retention, a degree-equivalent qualification can reinforce status and mobility. Where these conditions are absent, changing the credentials risks cosmetic improvement without real gains in employability. The test of success should remain the same: higher and more sustained employment, better match quality, and measurable earnings trajectories for graduates.

In sum, making skilling work in India requires aligning institutional incentives, employer partnerships, course portfolios, placement services, and integrity mechanisms around the lived outcomes of trainees. If this alignment is achieved, the attractiveness and dignity of skills-based pathways, whether labelled diplomas or degrees, will follow from their demonstrated value in the labour market rather than from optics alone.

## SKILLING STRATEGIES FOR YOUTH

12.46 The aspirational youth of the country need to be equipped to navigate the evolving dynamics of the job market. For building a skilled workforce, there is a felt need for vocational education to start early, as strong foundational skills can enable young people to acquire new skills, adapt to technologies, and progress over time. The Economic Survey 2024-25 highlighted the mismatch between educational attainment and occupational skill requirements, underscoring the need to integrate vocational education within the schooling system, enabling the development of relevant skills from an early stage and fostering an efficient alignment between education and labour market requirements.<sup>97</sup> The importance of early exposure to skills has also been highlighted in Chapter 11 of the Economic Survey.

12.47 Vocational education and training constitute a critical component of the education-employment interface, equipping individuals with occupation-specific skills required for effective labour market participation. By aligning learning with labour-market needs, vocational tracks have the potential to enhance employment prospects, facilitate smoother school-to-work (STW) transitions, strengthen workforce participation, and reduce unemployment, thereby contributing to broader economic and social development outcomes.

12.48 A 2025 National Skill Gap Study indicates that India still experiences a skill mismatch caused by several factors, such as weak foundational skills, a mismatch between industry needs and the training provided, and the inability to adapt to emerging technologies and processes.<sup>98</sup> Research suggests that school curricula focused on academic and college-preparatory tracks can lead to weaker STW transitions, skills mismatches, and differentiated outcomes. The returns to vocational education are higher compared to those of general education at the secondary level, and students who already express a preference for the vocational track experience greater benefits from vocational education at the upper-secondary stage.<sup>99,100,101</sup> For India, the PARAKH Rashtriya Sarvekshan 2024 findings show that only 47 per cent of schools offer skill-based courses at grade IX and above, and that participation remains low (29 per cent). Taken together, the evidence suggests that a narrow academic focus can lead to unintended outcomes, highlighting the need to integrate broader vocational learning into general education from an early stage.

<sup>97</sup> Economic Survey 2024-25: <https://tinyurl.com/24xa3p4b>

<sup>98</sup> MSDE. (2025). National skill gap study for high-growth sectors. <https://tinyurl.com/32ukesfp>

<sup>99</sup> Alon, T. M. (2018). Earning more by doing less: Human capital specialisation and the college wage premium (Doctoral dissertation). Northwestern University, Evanston, IL. <https://tinyurl.com/y7fryzc5>

<sup>100</sup> Zimmermann, M. (2021). Postsecondary and labour market outcomes of vocational vs. general higher track secondary pupils. *Education Economics*, 29(2), 213–231. <https://tinyurl.com/fr2evysx>

<sup>101</sup> Silliman, M., & Virtanen, H. (2022). Labour market returns to vocational secondary education. *American Economic Journal: Applied Economics*, 14(1), 197–224. <https://tinyurl.com/2wbvzjpe>

12.49 A World Bank Report highlights the need to develop effective strategies to enhance STW transition programmes. It suggests that agriculture and services are two key sectors with high potential for job creation. In the agricultural sector, the job opportunities have been identified in input companies, agro-processing supervisor, and advisory roles, all of which require high employability skills. Similarly, the service sector offers significant opportunities in retail, IT, banking, and other roles that require a multi-skilled approach.<sup>102,103</sup> Given this landscape, strengthening skilling at an early stage is essential to ensure that young people are equipped to fully benefit from this emerging job potential. **Box XII.7** discusses this aspect.

### Box XII.7: From classroom to career: How early vocational education can transform India's skilling landscape

Embedding vocational exposure within schooling has demonstrated how early, well-structured pathways can align education with evolving labour-market needs. Models from Germany, China, South Korea, Australia, Switzerland, and the USA illustrate this approach, revealing common structural features that underpin effective vocational pathways.

A review of international experience shows that effective vocational initiatives at the school level exhibit several common structural features. First, vocational orientation begins early. For example, Germany's differentiated lower-secondary structure, China's post-lower-secondary bifurcation into general and vocational tracks, Australia's vocational options soon after seven years of compulsory primary education, and the USA's high-school level Career and Technical Education, all introduce students to occupational choices at an early stage.<sup>104</sup> Second, these countries rely on strong dual or hybrid models that integrate school-based instruction with workplace training, as seen in Germany's dual system, Switzerland's arrangement where adolescents alternate between three to four days of apprenticeship and one to two days of classroom learning, and South Korea's Industry-Academy Integrated Apprenticeship Schools where high school students undertake a two-year apprenticeship beginning in their first year.<sup>105</sup> Third, industry participation is extensive, with employers contributing to curriculum design in all these systems, and German firms also paying apprenticeship wages and co-financing programmes.<sup>106</sup> Fourth, government support mechanisms play a key role, including China's tuition waivers and subsidies, Korea's structured employment-support services, and Australia's flexible qualification frameworks. Finally, these systems ensure flexible education routes, such as Korea's 'Job First, University Later' model and Germany's provisions granting vocational graduates access to general or

<sup>102</sup> World Bank. (2024). Jobs at your doorstep <https://tinyurl.com/ansd6uvn>

<sup>103</sup> A multi-skilled approach allows students to cover multiple skills, covering multiple job roles, which aligns with the industry's needs to be able to deploy its entry-level hires in a variety of roles.

<sup>104</sup> National Skill Development Corporation. (2020). Best global practices in technical and vocational education and training. NSDC. <https://tinyurl.com/4pez2ste>

<sup>105</sup> Park, J. et al. (2018). Apprenticeship in Korea 2018. KRIVET. Sejong. <https://tinyurl.com/5n72ahz3>

<sup>106</sup> Hippach-Schneider, U., Krause, M., & Woll, C. (2007). Vocational education and training in Germany: short description. <https://tinyurl.com/mrulyt4e>

subject-specific higher education.<sup>107</sup> Overall, these features underscore that strong vocational pathways within schools are shaped by early skill education, coordinated school-workplace training, sustained industry involvement, strong policy support, and flexibility between educational routes.

Some states in India have also taken steps to strengthen vocational education within schools. Under the Strengthening Teaching-Learning and Results for States (STARS) programme supported by the World Bank, some states have introduced a range of initiatives to strengthen STW transitions.<sup>108</sup> Madhya Pradesh's Skill GPS app, Rajasthan's Comprehensive Career Education Programme, and Maharashtra's Career Portal together expand data-driven career guidance and counselling for students in grades IX-XII.<sup>109</sup> Odisha enhances experiential learning through structured industrial visits, mapping nearby industries to ensure regular exposure to real work environments. Kerala's ESTEEM initiative and Himachal Pradesh's skill labs further support vocational training for targeted cohorts, such as learners with special needs and out-of-school youth. Meghalaya is enhancing vocational orientation through programmes that equip students with career-ready skills. Across 183 schools, more than 15,000 students in grades IX and X receive project-based training in IT, electronics, beauty and wellness, tourism, and plumbing, supported by digital tracking on the PRABANDH (Project Appraisal, Budgeting, Achievements and Data Handling System) portal.<sup>110</sup> These interventions aim to ensure that students gain both technical familiarity and applied learning experience during their formative years. Complementing these efforts is SPARK (School Programmes in Articulation, Resilience and Kindness) launched in 2024 by the Meghalaya government to strengthen students' communication, resilience, and emotional well-being.<sup>111</sup> Targeting grades VIII, IX and X, SPARK empowered 6,048 students across 28 institutions, logging 1,20,960 training hours in its pilot year (4 April 2024 – 20 June 2025).<sup>112</sup>

The government is implementing the Vocationalisation of School Education scheme under the Samagra Shiksha scheme for integrated school education aligned with the National Education Policy (NEP) 2020.<sup>113</sup> The scheme seeks to integrate vocational learning with general academic education to develop educated, employable and competitive individuals for a changing economy. The Employability Skills module, which covers communication, self-management, ICT, entrepreneurship and green skills, has been made mandatory across vocational courses. The CBSE has also introduced early vocational exposure by mandating Skill Education in grades VI-VIII, starting from the 2025-26 academic year, through the NCERT Kaushal Bodh textbooks. Schools are required to adopt a project-based learning

107 Ibid note 104 above

108 WB and MoE. STARS. School-to-Work Transition Achievement Booklet: <https://tinyurl.com/3t6ztrfv>

109 Ibid note 108 above

110 Education Department, Meghalaya. (2025). Initiatives under Samagra Shiksha. YouTube. <https://tinyurl.com/mwrt8f5p>

111 SPARK: <https://www.sparkindia.org/>

112 <https://www.sparkindia.org/sparkpilot>

113 Section 16.4 of NEP 2020 emphasises that vocational exposure will begin in middle and secondary school so that vocational learning is integrated early, ensuring every child learns at least one vocation and is exposed to several more. <https://tinyurl.com/2255c8k9>

approach that engages students in hands-on work across different domains, utilising available Composite Skill Labs, relevant tools, and support from local experts.<sup>114</sup> To reinforce experiential learning, schools are also encouraged to organise an annual Kaushal Mela (Skill Fair) to showcase students' projects and the skills acquired during the year.

Strengthening vocational education at the school level requires ensuring that curriculum structures allow adequate time for hands-on, project-based activities along with general education. This can be supported through enhanced teacher preparation, improved school equipment, and structured opportunities to build students' social and self-management skills. Schools also need access to suitable resources and flexible learning spaces for vocational training. Engagement with industry resource persons and community skill partners can enhance the practical relevance of learning and familiarise students with real work contexts. Additionally, creating spaces and platforms within schools for showcasing skills and reflecting on learning can make vocational education aspirational across the school ecosystem. Collectively, such measures will ensure that vocational learning is meaningfully integrated into schooling, creating a stronger pipeline of skill-ready learners.

12.50 Just like school education, vocational education in the higher-education ecosystem has also undergone a series of reforms aimed at improving flexibility and industry alignment. The National Credit Framework (NCrF) has enabled the accumulation and transfer of credits across academic, vocational, and work-based learning routes, thereby expanding mobility for students and improving the integration of skill-based components within degree programmes.<sup>115</sup> Further, the operationalisation of multiple entry-exit provisions allows learners to re-enter higher education with prior credits and accumulate qualifications in a modular manner. Additionally, the expansion of apprenticeship-embedded undergraduate degrees has strengthened industry linkages by incorporating structured on-the-job training into the curricula. Further, the launch of SWAYAM Plus in February 2024 has facilitated the delivery of industry-aligned digital courses in emerging areas such as artificial intelligence, data analytics, and robotics.<sup>116</sup> The National Apprenticeship Training Scheme (NATS) 2.0 has scaled apprenticeship support through over 12 lakh DBT stipend transfers.<sup>117</sup> Collectively, these measures reflect an ongoing transition toward a more flexible, modular, and

<sup>114</sup> Central Board of Secondary Education. (2025). Mandatory implementation of Skill Education and Kaushal Bodh textbooks in Grades VI–VIII in CBSE schools w.e.f. academic session 2025–2026. CBSE. <https://tinyurl.com/3r85st79>

<sup>115</sup> PIB release dated 29 July 2025: <https://tinyurl.com/mvcfh2sm>

<sup>116</sup> PIB release of Ministry of Education dated 27 February 2025: <https://tinyurl.com/mr3n8njt> SWAYAM is the Ministry of Education's (MoE) Massive Open Online Course platform that provides wide access to quality teaching and learning resources, particularly for learners with limited access to the digital knowledge economy.

<sup>117</sup> PIB release dated 29 July 2025: <https://tinyurl.com/3pnbv6ar>

labour-market-responsive education framework. More details are presented in Box XII.8.

### Box XII.8: Future-ready workforce through apprenticeships

Positioned at the intersection of formal education and on-the-job learning, apprenticeships offer young people hands-on experience, improve employability, and enable smoother STW transitions. As India accelerates towards a knowledge-driven and technology-intensive economy, the apprenticeship system is being reimagined to integrate new-age trades, align with global standards, and respond to the dynamic needs of industry. The goal is to design an apprenticeship system that balances benefits for employers and apprentices by setting high yet sustainable wages, ensuring high-quality on- and off-the-job training, and structuring work placements to allow employers to recover training costs while apprentices build advanced skills.<sup>118</sup>

Accordingly, the apprenticeship ecosystem has undergone a policy and structural transformation. The National Apprenticeship Promotion Scheme (NAPS) and NATS have been expanded to cover a wider range of sectors and enterprises. Over 43.47 lakh apprentices have been engaged under PM-NAPS across 36 states/UTs, with participation from more than 51,000 establishments, and female participation reaching 20 per cent.<sup>119</sup> The NATS programme also recorded engagement of 5.23 lakh apprentices in FY25, demonstrating the expanding scale and institutional maturity of India's apprenticeship framework.<sup>120</sup>

Despite this momentum, certain systemic challenges continue to hinder the full potential of the apprenticeship framework. Under the NAPS, over 6,100 enterprises are actively engaged in apprenticeship training, with over 9.9 lakh apprentices enrolled in FY26.<sup>121</sup> This represents a small fraction of the 5.2 lakh registered SMEs in the country.<sup>122</sup> If each of these SMEs were to enrol even two apprentices, the total number of apprentices could increase by over 10 lakh. The limited number of active establishments underscores the need to increase awareness of the scheme among industry partners, particularly SMEs.<sup>123</sup>

Additionally, the presence of multiple overlapping programmes, such as NAPS and NATS, with responsibility split between the MSDE and the Ministry of Education, makes it difficult for industry players to navigate the different processes and portals, resulting in a compliance

118 Kuczera, M. (2017). Striking the right balance: Costs and benefits of apprenticeship (OECD Education Working Paper No. 153). OECD <https://tinyurl.com/4sww52sd>

119 The KPMG Report titled 'Data Analysis: National Apprenticeship Promotion Scheme (Feb 2018-April 2025)' provides a comprehensive review of apprenticeship data. PIB of MSDE dated 26 May 2025; <https://tinyurl.com/59zb875p>

120 NATS dashboard: [https://nats.education.gov.in/dashboards/pub\\_dashboard.php](https://nats.education.gov.in/dashboards/pub_dashboard.php)

121 NAPS dashboard: <https://tinyurl.com/3r5h67s7> (as of 24 January 2026)

122 MSME dashboard: <https://dashboard.msme.gov.in/>

123 UNDP (2024) Unlocking opportunities: How embracing apprenticeships can shape India's youth employment. <https://tinyurl.com/bde5fcvn>

burden.<sup>124</sup> Regional disparities also persist in candidate registrations across states. While Maharashtra and Uttar Pradesh report over 10 lakh registered apprentices each, many North-Eastern states have only a few hundred to a few thousand registrations.<sup>125</sup>

To address these gaps, a unified apprenticeship mission may be needed to bring NAPS, NATS, and similar schemes under a single framework, ensuring better policy alignment and closer integration between education, skilling, and employment.<sup>126</sup> Strengthening District Skill Committees as local anchors can enable targeted outreach in states with low registrations, aspirational districts, and the North-Eastern region. Building on the pilot apprenticeship initiative in the North-Eastern Region, there is need to scale similar efforts to increase participation by establishments and apprentices across other regions.<sup>127</sup> Apprenticeship opportunities should also expand into new-age and gig economy sectors, including green manufacturing, logistics, and digital services, to meet emerging industry demands. Finally, enhanced industry participation can be encouraged through MSME cluster models and graded incentives tailored to companies based on their size.<sup>128</sup> There is a need to ensure continuity and support for apprentices by providing insurance coverage, travel and accommodation assistance, and linkages to post-apprenticeship employment or entrepreneurship schemes, making participation safer and more rewarding. Additionally, strengthening recognition of prior learning under Pradhan Mantri Kaushal Vikas Yojana (PMKVY) by linking it to formal learning pathways will allow apprentices to receive credit for their existing skills and experience, promoting lifelong skill development and mobility.<sup>129</sup>

By driving unified governance, localised implementation, and industry partnerships, India can transform its apprenticeship ecosystem to meet the evolving needs of the labour market and promote inclusivity, security, and aspiration. The convergence of policy reforms, institutional coordination, and industry engagement will position apprenticeships as a strategic lever for generating sustainable employment.

## Supply-driven to industry-driven skilling

12.51 As learners advance, education and vocational pathways must be closely aligned with industry, ensuring that curricula, pedagogy, and assessment reflect the real-world requirements and evolving demands of the workplace. Industry-driven skilling has become central to effective workforce development. Industry involvement in curricula, training, apprenticeships, and assessments aims to make skilling more market-responsive. Embedding industry participation across institutions, standards, and programme oversight can enhance the relevance and credibility of training.

<sup>124</sup> ILO 2022. Good practices in Apprenticeships in India: Challenges and opportunities. <https://tinyurl.com/5n8n5pdr>.

<sup>125</sup> Ibid note 121 above

<sup>126</sup> Ibid note 124 above

<sup>127</sup> PIB of MSDE dated 28 July 2025: <https://tinyurl.com/yeytdpd8>

<sup>128</sup> Ibid note 124 above. Small companies, where the requirement of apprentices is low, should be given more incentives to promote their participation in apprenticeship training.

<sup>129</sup> MSDE (2022) Recognition of Prior Learning (RPL) booklet <https://tinyurl.com/u7pvajwa>

12.52 In recognition of this, under PMKVY 4.0, training is imparted in NSQF-aligned job roles developed by industry-led Sector Skill Councils (SSC), and several courses are delivered directly within industrial premises with trainers sourced from the employer ecosystem.<sup>130</sup> Furthermore, regular Rozgar Melas and National Apprenticeship Melas enhance the interface between employers and job seekers. Under PMKVY 4.0, the sectoral focus on digital technologies, green energy, healthcare, advanced agriculture, financial services, and e-commerce reflects a calibrated effort to steer skilling investments toward India's long-term growth drivers and emerging opportunities in the global economy.

12.53 Mechanisms such as the Flexi-MoU scheme further support this shift by allowing firms to customise training and introduce courses aligned with their evolving skill needs. Prominent enterprises have been onboarded as industrial training partners, enabling the training of nearly 10,000 trainees so far.

12.54 Complementing firm-led training models, industry and market linkages are also being strengthened for traditional occupations through the PM Vishwakarma Kaushal Samman Yojana, launched in September 2023. The scheme aims to uplift the lives of traditional artisans and craftspeople by enhancing their skills and increasing the reach of their products and services. It seeks to provide end-to-end holistic support to artisans and craftspeople of 18 traditional trades who work with their hands and tools. As of 1 December 2025, 30 lakh beneficiaries have been registered, out of which 23.09 lakh beneficiaries have been trained.<sup>131</sup> Beneficiaries receive a PM Vishwakarma digital certificate and ID, enabling access to all scheme benefits, including skill upgradation, tool kit incentives (e-voucher up to ₹15,000), digital transaction incentives, and collateral-free loans up to ₹3 lakh at concessional interest rates.<sup>132</sup> Also, online marketing support is being provided to PM Vishwakarma beneficiaries through various e-commerce platforms to promote the sale of their products in the domestic as well as international markets. Additionally, over 30,000 Vishwakarma beneficiaries have been successfully onboarded on the Government e-Marketplace, enhancing their access to institutional buyers.

12.55 The skilling ecosystem at the ITI level is being strengthened by reforms focused on improving training quality, industry relevance, and institutional capacity. The National Scheme for Upgradation of ITIs proposes to upgrade 1,000 government ITIs, including 200 hub ITIs and 800 spoke ITIs, through smart classrooms, modern labs,

---

<sup>130</sup> PIB release of MSDE dated 15 December 2025: <https://tinyurl.com/57eacyrb>

<sup>131</sup> PIB release of M/o MSME dated 4 December 2025: <https://tinyurl.com/2ayrsnxy>

<sup>132</sup> PIB release dated 16 September 2025: <https://tinyurl.com/2uv6f5tm>

digital content, and industry-aligned long- and short-term courses.<sup>133</sup> In addition, the establishment of five sector-specific National Centres of Excellence for advanced training of trainers in partnership with global institutions would further enhance skill training. Implementation through special-purpose vehicles with anchor industry partners will enable outcome-based training and stronger industry linkages. Further, the NSQF-compliant training has been expanded by developing 169 trades, which include 31 future-skills courses in areas such as AI, internet of things (IoT), renewable energy and 3D printing, delivered through the nationwide network of ITIs and National Skill Training Institutes.<sup>134</sup> Together, these measures aim to reposition ITIs as modern, industry-integrated institutions that deliver high-quality, demand-driven vocational training. In this regard, the success achieved in Odisha can offer valuable lessons for others. These are presented in Box XII.9.

### Box XII.9: Strengthening Industrial Training Institutes: Lessons from Odisha's success

Improving employability through skilling initiatives and developing the required skill infrastructure has been a key priority of the government. The ITIs are foundational for achieving this. Over the years, a series of steps have been taken to revamp ITIs. These include the Centres of Excellence scheme, STRIVE funding, ITI grading, and mandatory Institute Management Committees. Despite these efforts, underutilisation of capacity, subpar training quality, faculty capabilities, and infrastructure that fall short of global benchmarks, as well as limited employability and entrepreneurial preparedness among most trainees, persist.<sup>135</sup>

Odisha started its skill transformation with the establishment of the Odisha Skill Development Authority (OSDA) in 2016. The mission of the OSDA was to 'Skill in Odisha'. For that, it followed a simple strategy, 'Fix, Accelerate, Scale.' The idea was to 'fix' the ITIs, 'scale' the short-term training programmes and 'accelerate' the setting up of advanced training institutes. At the core of this strategy was converging ongoing skill initiatives across departments, ensuring quality standards, and developing market-responsive training, inclusivity, and scalability.

#### Fixing the ITI

The strategy aimed to address key challenges, including the underutilization of ITIs and the lack of necessary infrastructure. The Odisha model addressed the demand slack by focusing on the perception of vocational education and ITIs. A role model campaign using the '10-6-4-2' formula focused on highlighting alumni success (10 successful alumni- six of whom are employed out of Odisha, four are women, and two are entrepreneurs). Confidence-building was done through changes in uniforms, ITI fests, and through global exposure.

<sup>133</sup> Recently launched as PM skilling and Employability Transformation through Upgraded ITIs (PM SETU). Guidelines: <https://tinyurl.com/wxkb98fm>

<sup>134</sup> PIB release of MSDE dated 1 December 2025: <https://tinyurl.com/2p9n36t8>

<sup>135</sup> NITI Aayog. (2023). Transforming Industrial Training Institutes. <https://tinyurl.com/5crx7x7>.

The key elements of the model such as image reinvention, alumni engagement, and success stories- are learnings that can be adapted by other states. Such campaigns can contribute to changing public perception, boosting enrolment, and improving employer connections. Going forward, at the district level, local ITIs and polytechnics should be revamped in a substantial, visible, and aspirational manner, making them attractive for students.

### **Scaling short-term training expansion:**

To strengthen the supply side, short-term skilling programmes such as Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) were scaled up in both volume and quality. Efforts were focused on improving trainee well-being at training centres, expanding outreach in rural areas, and using alumni role models to raise awareness. Urban events were organised to celebrate skilled workers and shift social perceptions about vocational training. Information gaps about future work pathways were addressed by highlighting examples such as DDU-GKY-trained sewing machine operators employed in Tata Aerospace for aircraft manufacturing.

Efforts to scale short-term training courses should prioritise raising awareness of the benefits and returns of skilling, improving trainee mobilisation, and elevating trainer standards.

Courses must align with local labour market demands, backed by trainer development and performance-based incentives.

### **Accelerate the establishment of the Advanced Training Institute**

The third arm of the strategy was to establish a world-class training institute in collaboration with the Institute of Technical Education - Education Services (ITEES), Singapore,<sup>136</sup> though the initial target was to establish eight of these. The Odisha World Skill Centre in Bhubaneswar, inaugurated in 2021, features Schools of Engineering and Services. It offers scholarships, training from basic to advanced levels (including safety and life skills), and leverages ITEES collaboration for teacher training. Similar centres, built with robust industry and international partnerships, can function as apex skilling institutions.

Taken together, the 'Fix; Scale; Accelerate' approach, inspired by Odisha's experience<sup>137</sup>, provides an adaptable template for strengthening the skill ecosystem and ITIs, transforming them from underutilised institutions into aspirational, high-quality institutions that can strengthen India's skill ecosystem.

## **Innovative financing mechanisms for skill development**

12.56 As skilling gains priority, public funding alone is insufficient to meet diverse needs, highlighting the need for alternative mechanisms. Varied and uncertain returns to skill investments combined with market failures, such as information gaps and credit constraints, hinder skill acquisition, underscoring the need for government-designed

<sup>136</sup> ITEES, Singapore: <https://itees.com.sg/about-us/>

<sup>137</sup> Bagchi, S. (2025). The day the chariot moved: How India grows at the grassroots. Penguin Business.

financing models that expand access, encourage private sector participation, and ensure broad-based economic benefits.<sup>138</sup>

12.57 Under NAPS 2.0, the government now transfers 25 per cent of the prescribed stipend directly to apprentices through DBT enhancing transparency, reducing administrative burden, and improving cash-flow predictability for establishments. As of 31 October 2025, an amount of ₹1,110.64 crore has been released as stipend support directly to apprentices under this framework.

12.58 International experience suggests that loan systems can incorporate incentives that encourage learners to pursue skill training or occupations aligned with national priorities.<sup>139</sup> Designing such systems with appropriate incentives can help ensure expanding access to skill training. In India, the modified Credit Guarantee Fund Scheme for Skill Development (CGFSSD), operationalised as the Model Skill Loan Scheme in 2024, aims to strengthen the credit-based route for skill acquisition by increasing the maximum loan limit and expanding the pool of eligible lending institutions.<sup>140</sup> The scheme also extends coverage to non-NSQF courses offered by training entities registered on MSDE's SIDH.

12.59 Beyond traditional grants and credit-based instruments, outcomes-based financing models offer a complementary approach to mobilising private capital while retaining public accountability. India's Skill Impact Bond (SIB), implemented by MSDE through NSDC, demonstrates how performance-linked payment mechanisms can align public objectives with private investment by linking funding to independently verified placement and retention outcomes. By de-risking private participation and rewarding sustained employment rather than enrolments alone, such models can expand the financing envelope for skilling while incentivising quality, employer alignment, and long-term labour-market impact.<sup>141</sup>

12.60 Other than government financing, co-investing in training through mandatory or voluntary contributions by employers offers an alternative approach to financing skill development. It is used in countries such as Belgium, Cyprus, Denmark, France, Greece, Hungary, Ireland, Italy, Korea, Malaysia, the Netherlands, Singapore, and Spain.<sup>142</sup> Ireland's Skillnet training networks bring together private firms to undertake

---

138 OECD (2017), Financial Incentives for Steering Education and Training, Getting Skills Right, OECD Publishing, Paris <https://tinyurl.com/3p2uhh35>

139 Ibid note 138 above

140 PIB release of MSDE dated 25 July 2024: <https://tinyurl.com/2mz4rvf6>

141 NSDC Portal: <https://nsdcindia.org/sib>

142 Dickinson, P., & Marsden, J. (2013). International evidence review on co-funding for training <https://tinyurl.com/mvbw88y3>

collaborative training activities that are otherwise difficult to implement individually. A broad network of Skillnet groups across Ireland is funded by the government and the National Training Fund, with support from employer contributions. These models help address sector-specific skill gaps while ensuring deeper employer engagement in the skilling ecosystem.<sup>143</sup> Similarly, in India, employers support workforce training. For example, certain companies provide paid education leave and sponsor higher education for permanent employees, while IT firms often fund online courses and training programmes.<sup>144</sup> The SSCs under NSDC further facilitate industry-led investments in skill development, helping address sector-specific gaps and strengthen employer engagement. In FY25, almost 1.13 lakh candidates were trained through industry funding under SSCs.<sup>145</sup>

12.61 Learner choice, quality, and affordability are vital to effective vocational education. Allowing learners more control over course selection can enhance engagement and completion rates. At the same time, social and institutional factors may limit participation, emphasising the need for inclusivity. Maintaining high quality is crucial for the credibility and relevance of training, while affordability ensures access and informed choices. Together, these factors create a more inclusive and balanced vocational skilling system. Box XII.10 discusses how skill vouchers can be an effective lever in exercising individual choice for skilling.

#### **Box XII.10: Skill vouchers: Making training systems more flexible, fair, and future-ready**

Skill vouchers represent a promising alternative to financing skill development. This is a demand-side financing instrument that enables trainees to choose their preferred courses and encourages competition among training providers to offer higher-quality programmes. The learner chooses the course, contributes a small co-payment, and the training institute redeems the voucher for payment upon meeting specified performance criteria.<sup>146</sup>

Skill vouchers have been successfully implemented in various formats in countries such as Singapore, Germany, the USA, Australia, and Kenya. They can be designed as targeted interventions, as seen in Germany's Training Voucher Programme<sup>147</sup>, the United States' Trade Adjustment Assistance programme<sup>148</sup> and Kenya's Technical and Vocational Vouchers

<sup>143</sup> Ibid note 138 above.

<sup>144</sup> ILO (2025). Financing lifelong learning in India <https://tinyurl.com/4ce3mpn3>

<sup>145</sup> Annual report 2025 MSDE: <https://tinyurl.com/4exmbk3j>

<sup>146</sup> Centre for Civil Society. Vouching for change: Vikalp skill voucher project brochure. <https://tinyurl.com/3etsh9wf>

<sup>147</sup> Huber, M. et al. (2018). Direct and indirect effects of training vouchers for the unemployed. *Journal of the Royal Statistical Society Series A: Statistics in Society*, 181(2), 441-463 <https://tinyurl.com/5n6rfm8w>

<sup>148</sup> Barnow, B.S. (2009). Vouchers in U.S. vocational training programs: an overview of what we have learned. *ZAF* 42, 71–84. <https://doi.org/10.1007/s12651-009-0007-9>

rogramme<sup>149</sup>, or as near-universal entitlements, like Singapore’s Skills Future Credit.<sup>150</sup> All these programmes provide trainees with autonomy to choose their training institute and programme. Non-redemption is not penalised; instead, the unused voucher simply lapses. This ensures that trainees only enrol in courses that match their expectations, while encouraging training institutes to maintain and improve the quality of their programmes. Evidence suggests that the provision of appropriate counselling, assessment, and the availability of performance information are essential for the success of the programmes.<sup>151,152</sup>

In India, both state governments and civil society organisations have implemented skill-voucher initiatives. The Adi Dravidar and Tribal Welfare Department of the government of Tamil Nadu launched a skill voucher scheme in 2024 for Adi Dravidar, Tribal, and Christian Adi Dravidar students who pass their graduation, post-graduation, and technical courses with 60 per cent or more marks.<sup>153</sup> Under the scheme, eligible students received vouchers valued at ₹12,000, ₹15,000, or ₹25,000 to enrol in training programmes in emerging fields, offered by training institutions listed on approved platforms.

In Maharashtra’s Vikalp Skill Voucher Programme, redeemable skill vouchers were provided, allowing students to select accredited training institutes. Payments to trainers were linked to specific outcomes, including course completion, certification, and job placement.<sup>154</sup> The model enhanced cost efficiency, strengthened trainee commitment and ownership, and achieved a job-retention rate of 60 per cent among those who completed the training within the prescribed time.<sup>155</sup>

These initiatives and international experience provide valuable lessons in designing inclusive, accountable, and effective skill voucher programmes. For states implementing these programmes, expanding vouchers beyond targeted groups and conducting regular impact assessments would provide valuable insights for scaling, enhancing choice, equity, and overall effectiveness across the skilling ecosystem. In addition, empanelment of training providers based on quality standards, combined with performance-based monitoring, ensures that meaningful outcomes are achieved.

## From challenges to accountability via skilling scorecard

12.62 Skill training programmes assume a baseline level of readiness, but weak foundational skills, such as literacy, numeracy, and soft skills, create employability

149 Hicks, J. et al. (2011). Vocational Education Voucher Delivery and Labour Market Returns: A Randomised Evaluation among Kenyan Youth (Final Report for the Spanish Impact Evaluation Fund – SIEF Phase II). World Bank <https://tinyurl.com/5f96yp59>

150 <https://tinyurl.com/5xpwyvv5>

151 Ibid note 148 above.

152 Kaplan et al. (2015). Training Vouchers and Labour Market Outcomes in Chile. <https://doi.org/10.18235/0011685>

153 Adi Dravidar & Tribal Welfare Department, Tamil Nadu. (2025). Policy note 2025-26. Government of Tamil Nadu (<https://tinyurl.com/4uyvj2y5>)

154 A joint initiative of the NSDC, BARTI (Dr Babasaheb Ambedkar Research and Training Institute), the Centre for Civil Society, and the Michael & Susan Dell Foundation, which was piloted in Mumbai and Pune. Accelerating skills through vouchers: An implementation guide. Centre for Civil Society. <https://tinyurl.com/5ymzdua7>

155 Ibid note 154 above.

mismatches that vocational training alone cannot remedy.<sup>156</sup> These gaps are compounded by regional disparities in employability (Northern and Southern states performing better), demographic disparities (the 22–25 age group dominates youth employability), and low overall employability (56.3 per cent).<sup>157</sup>

12.63 Furthermore, weak technical and vocational education and training (TVET) quality, resulting from inadequately trained instructors, outdated curricula, and limited practical exposure, means that even certified candidates often fail to meet firms' expectations. Local skilling remains inadequately aligned with industry needs, traditional sectors (such as weaving, dairy and entry-level manufacturing) are perceived as low status and not well-paid, and youth wage aspirations frequently exceed what firms can offer, resulting in high early turnover and limited adaptability to rapid technological change.<sup>158</sup> Infrastructure gaps, insufficient industry-academia collaboration, and financial limitations further compound these challenges.<sup>159</sup> Within this broader context, PMKVY faces significant implementation challenges, including inconsistencies in beneficiary and data management, delays in disbursing funds, gaps in monitoring systems, and low placement outcomes.<sup>160</sup>

12.64 The chapter has already discussed solutions like programme convergence, early vocational education, strengthening industry linkages, and alternative financing. However, a comprehensive evaluation of the skilling system is essential to benchmark performance across regions, enforce outcome metrics, and drive demand-led reforms. Evaluation of skill initiatives must move beyond compliance-based metrics such as enrolments and certifications, towards assessing whether skilling programmes generate sustained labour-market value in terms of employability, earnings, and job retention. Critically, evaluation should follow the trainee's post-training trajectory rather than the administrative cycle of the scheme. The third-party assessments of flagship schemes, such as PMKVY, Jan Shiksha Sansthan, ITIs, and NAPS, indicate positive outcomes in terms of trainee income, placements, and employer demand.<sup>161</sup> Most of these evaluations date back to 2020-21. Given rapid technological change and evolving

<sup>156</sup> MSDE (2025). National skill gap study for high-growth sectors. <https://tinyurl.com/2hh25vkp>

<sup>157</sup> India Skill Report 2026. <https://wheebox.com/india-skills-report.htm> Employability is measured by drawing insights from over 1 lakh candidates who participated in the Global Employability Test (G.E.T.) The ETS Wheebox Global Employability Test is a standardised online skill evaluation designed to measure the job readiness of India's youth in alignment with evolving global workforce demands. The 2026 test was conducted across higher education institutions, technical universities, vocational centres, and polytechnic institutions, as well as in select international partner regions.

<sup>158</sup> Ibid note 156 above.

<sup>159</sup> Mehta, J et al (2024). Skill development in India: Challenges, current, and future perspectives. *The Scientific Temper*, 15(spl-2):116-122. <https://tinyurl.com/u5u2d396>

<sup>160</sup> CAG (2025). Report No. 20 of 2025: Performance audit of Pradhan Mantri Kaushal Vikas Yojana (PMKVY). <https://tinyurl.com/4xs6bpf3>

<sup>161</sup> PIB release of MSDE dated 1 December 2025: <https://tinyurl.com/2dddv268>

local labour-market demand, a fresh and outcome-oriented reassessment, anchored in medium-term employment and earnings outcomes, is therefore essential.

12.65 The integration of SIDH, NCS and e-Shram portal has created a robust digital infrastructure that can be leveraged for real-time monitoring and assessment, linking training records with employment outcomes, employer demand, and individual skilling trajectories. This infrastructure can enable the continuous tracking of individual trainees, beginning with baseline profiles that capture prior education (through integration of APAAR IDs<sup>162</sup>) and work history, and location. This profile must be followed through the training and employment cycle, including certification, placement, or apprenticeship, as well as six- and twelve-month employment and earnings outcomes. Further integration with platforms like PM Vishwakarma, EPFO, ESIC, etc, can provide greater insights into the trajectory of unorganised and traditional workers. Such integration would support evidence-based reassessment of schemes, improve targeting, and better align training supply with labour-market needs.

12.66 Mature skilling and apprenticeship systems across Europe and East Asia converge on three evaluation habits that India can adapt rather than copy mechanically. First, they measure employment and wage outcomes longitudinally. In Singapore's adult learning system, for instance, training cohorts are tracked for post-course employability and wage effects, and the publication of these indicators shapes future course design and budget allocation.<sup>163</sup> Second, in the dual-system traditions of Germany and Switzerland, employers are structurally embedded in curriculum definition, workplace learning and assessment, which creates a natural outcome-monitoring loop because firms have direct stakes in trainee capability and retention.<sup>164</sup> Third, in countries such as Korea, active labour-market programmes are treated as policy instruments that must continually justify scale, with periodic reviews that prune weak interventions and expand strong ones.<sup>165</sup> The transferable lesson is not that a single institutional model guarantees success, but that systems which consistently generate value do so by linking funding, course portfolios and institutional legitimacy to measured outcomes over time.

12.67 In India, longitudinal tracking of trainees through their UAN, which can be used for EPFO, ESIC, and other social security schemes, would enable the measurement of long-term impact. Outcome-linked financing could further incentivise training quality, allowing high-performing institutions to expand while phasing out those with low demand. A comprehensive data-driven scorecard system that tracks employment

---

162 APAAR (Automated Permanent Academic Account Registry) enables students to securely store and transfer academic records, facilitating credit recognition and seamless mobility across institutions from the school level and supporting recognition of prior learning. <https://apaar.education.gov.in/>

163 Ministry of Education, Singapore (2020): <https://tinyurl.com/mssa8ruz>

164 OECD (2025), Vocational Education and Training Systems in Nine Countries, OECD Reviews of Vocational Education and Training, OECD Publishing, Paris, <https://doi.org/10.1787/1a86eb6c-en>.

165 Government of Korea (2009), Framework Act on Employment Policy <https://tinyurl.com/2xbze93c>

outcomes, retention, earnings, and training quality can guide policy decisions and help learners make informed choices, ensuring more efficient and effective utilisation of skilling resources.

## OUTLOOK

12.68 India has recorded significant employment growth in recent years, supported by structural reforms, tax rationalisation, and a sustained focus on skill development. Measures such as deregulation, GST 2.0, and labour reforms implemented by states have contributed to rising labour force participation and employment growth across industry and services.

12.69 The employment and skilling ecosystem is being reshaped by demographic shifts, technological change, and evolving industry needs, including the expansion of gig and platform work. Amid these developments, the effective implementation of Labour Codes would play a key role in supporting formal employment and improving security for women and gig workers. As definitions of work continue to evolve, dynamic labour policy and flexible regulatory frameworks would ensure employment expansion, worker security and well-being.

12.70 On the skills front, flexible vocational pathways starting at the school level will be required, going forward. Recent skilling initiatives reflect a shift towards a more modular and labour-market-responsive framework, helping reduce skill mismatches and support employment generation. Targeted skilling for women and youth in high-productivity sectors will be critical for inclusive outcomes.

12.71 As India moves ahead in its growth journey, advancing institutional convergence and fostering a whole-of-government approach would enable the skilling and employment initiatives to operate in a coherent manner. The development of an information system that brings together data from e-Shram on unorganised workers, NCS on job vacancies and required skills, and SIDH on training opportunities can lay the foundation for an integrated digital public infrastructure. This could set the stage for a sharper emphasis on industry-driven skilling, which remains central to building job-ready talent and strengthening skill-industry linkages.

\*\*\*

*This page has been left blank*

# RURAL DEVELOPMENT AND SOCIAL PROGRESS: FROM PARTICIPATION TO PARTNERSHIP



*India's pursuit of inclusive growth under the development model of 'Sabka Saath, Sabka Vikas, Sabka Prayas, Sabka Vishwas' has yielded measurable gains in recent years, reflected in sustained poverty reduction, narrowing inequalities, and improved access to basic services. Rural transformation has played a central role in this progress, driven by infrastructure investments, reforms in employment frameworks, the adoption of technology, and enhanced participation of local governments, and community institutions.*

*Inclusive development in India emphasises fairness, dignity, and equal rights for all, with the empowerment of vulnerable and marginalised groups at its core. Government affirmative action in education, healthcare, skill development, and livelihoods has facilitated social and economic mobility for the most vulnerable. Importantly, the development narrative is shifting from government-led schemes to community-driven initiatives, enabling local voices to shape solutions, and making growth more participatory, meaningful, and sustainable.*

## INTRODUCTION

13.1. Social mobility and equal opportunity are key to thriving societies and economies. Nonetheless, these have been challenging goals to meet. Equality of opportunities ensures greater social mobility by providing an equal and merit-driven framework for personal progress.

13.2. Social mobility can be understood as inter-generational mobility and also as intra-generational mobility, i.e. changes in a person's social or economic status during their own lifetime. Factors such as health, education (including access, quality, and equity, as well as lifelong learning), technology, work (opportunities, wages, and working conditions), and protection and institutions (social protection and inclusive institutions) are considered key determinants of social mobility across both dimensions. Low social mobility entrenches historical inequalities, and higher income inequalities fuel lower social mobility. Enhancing social mobility can transform this vicious cycle into a virtuous one, yielding positive benefits for broader economic growth.

13.3. Recognising the importance of enhancing social mobility to break cycles of

inequality, the government has implemented targeted initiatives across education, health, and social protection. In educational efforts, the focus is on ensuring the availability, quality, and equitable distribution of educational programmes, particularly to those who need them most. In health, measures include public investment to provide affordable preventive and curative care, nutrition, and health insurance. These measures have been discussed in detail in Chapter 11 of the Economic Survey. Government measures also focus on inclusion and accessibility for persons with disabilities, including targeted economic and entrepreneurial support, digital and technological empowerment, and the development of social justice and legal frameworks. These steps are designed to reduce structural barriers, empower marginalised groups, and create pathways for all citizens to improve their socio-economic status.

13.4. The focus of the government is also on making available and financing, where required, skills development, especially in the present context of technology-driven disruption to jobs and skills. As digitalisation and the use of AI (artificial intelligence) continue to reshape work, workers and employers are entering into more flexible work relationships. This has taken the form of a flourishing gig economy. There is a need to support those engaged in the economy through specific social protection measures. These are discussed in Chapter 12 of the Economic Survey.

13.5. Against this background, this chapter examines the country's progress across key social indicators. The first section reviews achievements in reducing poverty and inequality. The second section examines trends in government social sector expenditure. The third section focuses on recent developments in the rural economy, highlighting the contributions of communities, the integration of technology, and capacity building to economic growth. The final section examines how social justice initiatives promote ongoing inclusion as India progresses on its development path.

## **LIFTING MILLIONS UP: PROGRESS ON POVERTY AND INEQUALITY**

13.6. Poverty and inequality are important issues for any developing country. The state endeavours to ensure equality of opportunities, eliminate absolute poverty, and prevent inequality from rising. It aspires for and works towards the goal that everyone in society has a fair chance to fulfil their potential, regardless of their socio-economic background, the origin of their parents, or geographical location. Policies such as income support, social protection, labour market regulation, and education for all help the state in its endeavour to ensure the goals of upward social mobility across generations and throughout an individual's lifespan. For example, enhancing access to educational opportunities throughout a person's life is a crucial factor that acts as a powerful 'equaliser' of chances to improve one's life.

13.7. These aspirations and policy efforts are commonly assessed using benchmarks of poverty and deprivation. One such metric is the World Bank's (WB) International Poverty Line (IPL), which represents the minimum amount of money a person needs per day to afford basic necessities such as food, clothing, and shelter. In June 2025, the WB raised the poverty line from USD 2.15 to USD 3.00 a day, adjusted for the purchasing power of money to 2021 prices.<sup>1</sup>

13.8. With the revised IPL, the poverty rates for India in 2022-23 are 5.3 per cent for extreme poverty and 23.9 per cent for lower-middle-income poverty.<sup>2</sup> According to the WB, India has made significant strides in reducing non-monetary poverty. The WB Multidimensional Poverty Measure for India stood at 15.5 per cent in 2022-23, reflecting ongoing improvements in living conditions.<sup>3</sup> These estimates corroborate the estimates of the Multidimensional Poverty Index (MPI) as measured by NITI Aayog.<sup>4</sup> The index measures non-monetary poverty by considering factors such as education, health, and living conditions. It shows a decline from 55.3 per cent in 2005-06<sup>5</sup> to 14.96 per cent by 2019-21<sup>6</sup>, and is estimated to have decreased further to 11.28 per cent in 2022-23.

13.9. Alongside the WB poverty estimates, poverty estimates by researchers based on the Tendulkar committee poverty line also indicate a sharp and broad-based decline in poverty in India. Between 2011-12 and 2023-24, sustained economic growth, supported by redistributive interventions, is estimated to have reduced the poverty rate from 21.9 per cent in 2011-12 to 4.7 per cent in 2022-23 and further to 2.3 per cent in 2023-24.<sup>7</sup> The estimates indicate low poverty incidence across states and in both rural and urban areas. These achievements demonstrate the government's commitment to inclusive development by targeting both rural and urban communities through welfare programmes, economic reforms, and enhanced access to services, thereby significantly reducing poverty.

1 The IPL reflects updated information from new surveys in various countries, including the Household Consumer Expenditure Surveys for India. It uses improved methods for estimating poverty in countries with limited data, and a revised approach to categorising countries. <https://tinyurl.com/ys8ntsjd>

2 WB India Poverty and Equity Brief: October 2025 (<https://tinyurl.com/2f6ytkmf>). The poverty estimates are based on the Household Consumption Expenditure Survey (HCES) data collected for August 2022 to July 2023.

3 The World Bank's Multidimensional Poverty Measure is adapted from the OPHI MPI. It includes extreme poverty but excludes deprivation in nutrition and health. OPHI MPI captures the acute deprivations in health, education, and living standards that a person faces simultaneously.

4 Multidimensional Poverty in India Since 2005-06. <https://tinyurl.com/ya2rnbxj>

5 National Family Health Survey (NFHS) round 3 (2005-06)

6 NFHS round 5 (2019-21)

7 Panagariya, A., & More, V. (2025). Mapping poverty across social, religious, and economic groups in India. *Economic and Political Weekly*, 60(48) <https://tinyurl.com/44r76e6s>



households through extensive community participation, led by local governments and supported by frontline workers, including ASHA (Accredited Social Health Activist), Anganwadi workers, Kudumbashree, and activist groups. Essential documents such as Aadhar, ration cards, Unique Disability ID (UDID) cards for the differently-abled, and electoral IDs, along with emergency services like health insurance and social security pensions, were provided to families. The programme prioritised ensuring basic food and medical care. Individualised micro-plans were created for each family, with regular digital tracking and monitoring service delivery by local self-governments and departments. The Kudumbashree network played a key role as both community monitor and service provider, while local governments prioritised these interventions in their annual development plans.<sup>12</sup> The Union government, through the Ministry of Rural Development, has launched the ‘Samaveshi Aajeevika Yojana’ programme under the umbrella of Deendayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY-NRLM), as a comprehensive livelihoods programme designed to put rural women on the path to self-sufficiency, built on the ‘Graduation approach.’<sup>13</sup>

13.13. Both SJY and the Kerala model showcase the involvement of the community and a multipronged strategy with continuous support and monitoring to ‘push’ the vulnerable out of the vicious cycle through handholding support, training, access to finance, and basic necessities. These interventions enable households to become self-reliant and resilient even in times of crisis. A study by J-PAL found that SJY beneficiaries reported having a stable income source, even as other income opportunities, like casual labour, disappeared due to COVID-19.<sup>14</sup>

13.14. These state-level innovations reflect broader national priorities, where targeted social investment is being scaled up to support inclusive growth. Understanding trends in social sector expenditure offers insight into the government’s approach to enhancing well-being and expanding social protection nationwide.

## **Social sector expenditure trends**

13.15. Inclusive growth based on the principle of ‘Sabka Sath, Sabka Vikas, Sabka Vishwas, Sabka Prayas’ is the government’s model for economic development. The government’s efforts to provide affordable housing, social security for workers, food security, financial inclusion, universal access to basic amenities, and high-quality, affordable healthcare are instrumental in improving the overall well-being and standards of living. The Ministry of Statistics and Programme Implementation’s (MoSPI) latest

<sup>12</sup> Kerala Extreme Poverty Alleviation Project (EPEP): <https://tinyurl.com/4ssapa3y>

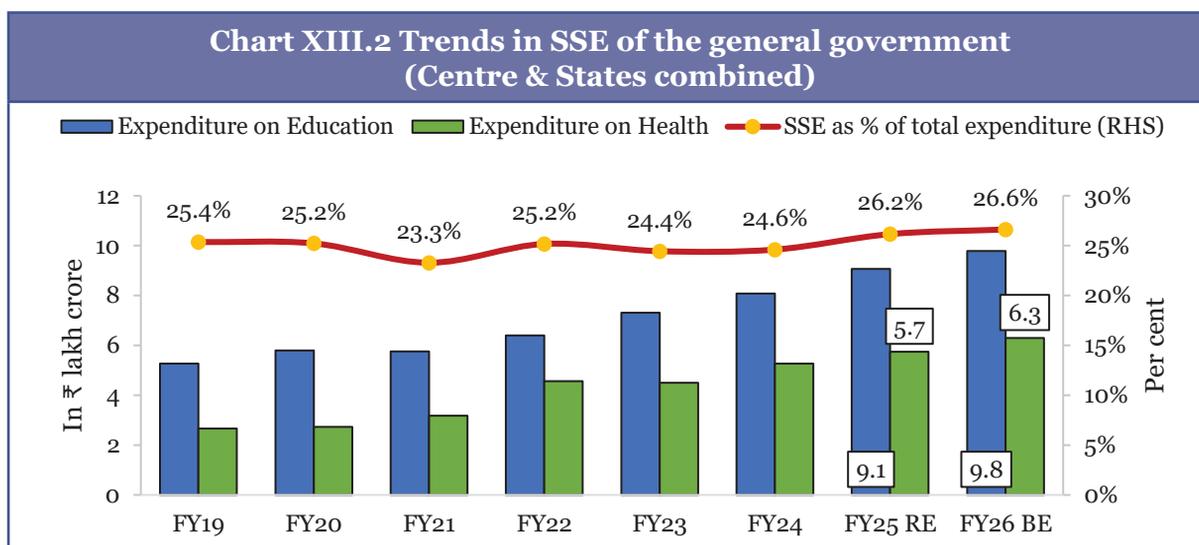
<sup>13</sup> Samaveshi Aajeevika Yojana: <https://tinyurl.com/352xb8wk>

<sup>14</sup> The Graduation Approach during the Covid-19 Pandemic: Building Resilience among Ultra-poor Households in Bihar <https://tinyurl.com/bdyhc44x>

Sustainable Development Goal (SDG) National Indicator Framework (NIF) Progress Report, 2025, provides a comprehensive picture of the impact of these initiatives in achieving a transformative scale-up towards achieving the SDG targets.<sup>15</sup>

13.16. According to the report, the population covered by social protection systems has increased from 22 per cent in 2016 to 64.3 per cent in 2025, indicating a substantial expansion in social security coverage in the country. The population using improved drinking water sources in rural areas has increased from 94.6 per cent in 2015-16 to 99.6 per cent in 2024-25. Universal household electrification was achieved in 2021-22, while 100 per cent of the districts were declared open defecation free (ODF) in 2019-20, and over 96 per cent of Swachh Bharat Mission (SBM) villages have achieved the ODF plus status (As of 31 December 2025).<sup>16</sup>

13.17. Realising the importance of the inclusive developmental goal, the general government’s social services expenditure (SSE) has kept pace with the development of the social sector.<sup>17</sup> The general government’s SSE has shown a rising trend since FY22. During the five years from FY22 to FY26 (BE), the SSE grew at a compound annual growth rate (CAGR) of 12 per cent. Expenditure on education<sup>18</sup> has grown at a CAGR of 11 per cent, whereas expenditure on health<sup>19</sup> grew at a CAGR of 8 per cent during the same period.



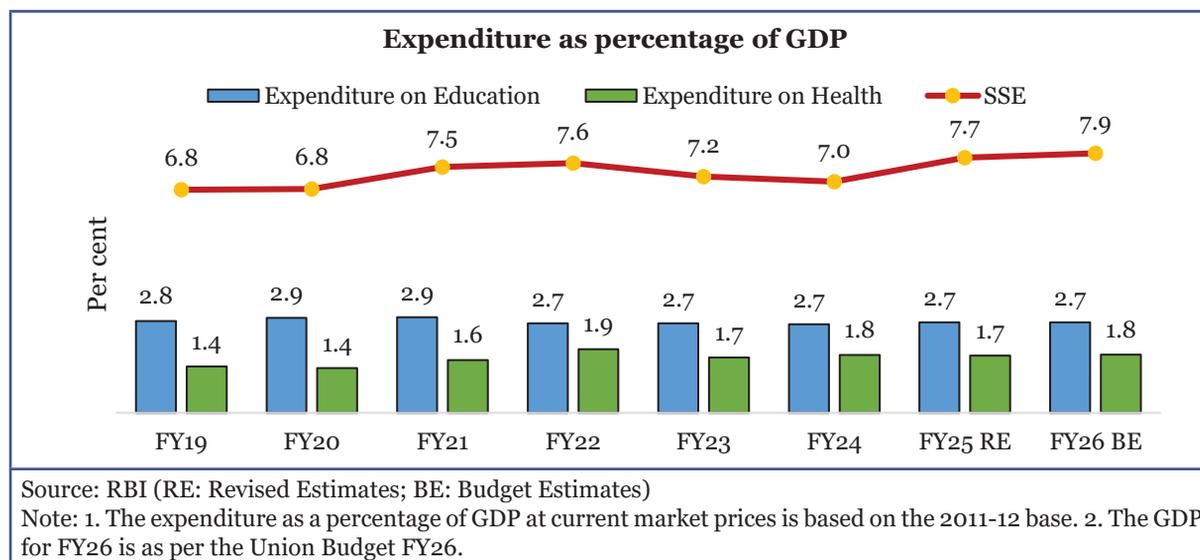
15 SDG National Indicator Framework (NIF) Progress Report, 2025: <https://tinyurl.com/9tcb5p4p>

16 SBM Grameen Dashboard: <https://tinyurl.com/mrxpjjpx>

17 Social services include education, sports, art and culture; medical and public health, family welfare; water supply and sanitation; housing; urban development; welfare of SCs, STs and OBCs, labour and labour welfare; social security and welfare, nutrition, relief on account of natural calamities, etc.

18 Expenditure on 'Education' pertains to expenditure on Education, Sports, Arts and Culture.

19 Expenditure on 'Health' includes expenditure on 'Medical and Public Health', 'Family Welfare' and 'Water Supply and Sanitation'.



## TRANSFORMING THE RURAL ECONOMY

13.18. Rural development stands at the core of India’s journey towards inclusive economic growth, given that a substantial majority of the population continues to reside in rural areas. With 6.65 lakh villages and 2.68 lakh Gram Panchayats (GPs) and Rural Local Bodies, the rural landscape forms the backbone of the nation’s social and economic development.<sup>20</sup> While government initiatives have prioritised infrastructure, credit access, basic amenities, and the development of agriculture and traditional industries to make the rural economy self-reliant and resilient, it is the third pillar, the community itself, that holds the key to sustainable transformation. Empowering rural communities and nurturing collective action are essential for inclusive development.

13.19. NABARD’s latest Rural Economic Conditions and Sentiments Survey (RECSS) (November 2025) round findings show a broad-based strengthening of rural economic fundamentals, with robust consumption, high income growth, rising investment, improved formal credit access, lower inflation perceptions, better loan repayment conditions, and strong satisfaction with infrastructure, all supported by government welfare transfers and public investment.<sup>21</sup>

13.20. Furthermore, the findings of RECSS are complemented by a recent research report stating that rural consumption has risen to its highest level in 17 quarters.<sup>22</sup> The report attributes this upturn to firm growth in real agricultural and non-agricultural

<sup>20</sup> PIB release dated 6 February 2025: <https://tinyurl.com/bddttat2>

<sup>21</sup> NABARD RECSS Round 8 (November 2025): <https://tinyurl.com/4jdv4jwp> The survey captures quantitative and qualitative data, both backwards-looking (economic conditions) and forward-looking (household sentiments), on a limited set of key macro-financial parameters relating to the rural economy.

<sup>22</sup> Piplani, R., & Ladha, T. (7 November 2025). Rural rules, urban follows. Motilal Oswal Financial Services Ltd. <https://tinyurl.com/36xfh7h9>

wages, higher sales of tractors and fertilisers, and robust farm credit, as well as healthy reservoir levels, lower input costs, and steady MSP (Minimum Support Price) procurement, all of which have supported sowing activity and farm incomes. These developments collectively indicate improving rural economic conditions.

13.21. These findings are complemented by a decline in dependence on the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) for employment in rural areas. While MGNREGS has long served as a critical safety net for rural households, recent trends reveal a notable decline in work demand under the scheme. Person days generated have declined significantly from a pandemic peak of 389.09 crore person days in FY21 to approximately 183.77 crore in FY26 (up to 31 December 2025), representing a decline of over 53 per cent.<sup>23</sup> This decline in MGNREGS demand coincides with a decrease in rural unemployment, from 3.3 per cent in 2020-21 to 2.5 per cent in 2023-24, suggesting that many rural households may be accessing non-farm or other non-MGNREGS work.<sup>24</sup>

### **Reimagining rural employment in a changing rural economy**

13.22. These developments highlight a marked improvement in the rural economy driven by strong macroeconomic fundamentals and a reduced dependence on MNREGS as a source of livelihood. At the same time, they underscore the need to re-examine the design and objectives of employment guarantee programmes in light of changing rural realities.

13.23. Rural employment has been a cornerstone of India's social protection framework for nearly two decades. Since its enactment in 2005, the MGNREGS has provided wage employment, stabilised rural incomes, and created basic infrastructure, offering at least 100 days of guaranteed unskilled work to rural households. Over time, increasing incomes, enhanced connectivity, widespread digital adoption, and diversified livelihoods have transformed the nature of rural employment requirements, emphasising both the programme's achievements and the need to reassess its design and aims.

13.24. Over the years, a range of administrative and technological reforms have enhanced the implementation of the scheme, resulting in notable improvements in participation, transparency, and digital governance. Women's participation rose steadily from 48 per cent to 58.1 per cent between FY14 and FY25, Aadhaar seeding expanded sharply, the Aadhaar-Based Payment System was widely adopted, and electronic wage payments became nearly universal. Monitoring of works also improved, with a large expansion in geo-tagged assets and a growing share of individual assets created at the household

<sup>23</sup> MNREGS dashboard: <https://nrega.nic.in/>

<sup>24</sup> Annual Periodic Labour Force Survey report 2023-24 (July-June period): <https://tinyurl.com/mt4w3ja4>

level. Field-level staff played a critical role in sustaining implementation despite limited resources.

13.25. However, alongside these gains, deeper structural issues persisted. Monitoring in several states revealed gaps, including work not being done on the ground, expenditure not matching physical progress, the use of machines in labour-intensive work, and frequent bypassing of digital attendance systems. Misappropriation accumulated over time, and only a small proportion of households completed the full 100 days of employment post-pandemic, indicating that while delivery systems improved, the overall architecture of MGNREGA has reached its limits and warrants reassessment in light of evolving rural realities.<sup>25</sup>

13.26. Against this backdrop, the government has enacted the Viksit Bharat- Guarantee for Rozgar and Aajeevika Mission (Gramin) Act, 2025, also referred to as VB - G RAM G Act, 2025. The Act is a comprehensive statutory overhaul of MGNREGS, aligning rural employment with the long-term vision of Viksit Bharat 2047, while strengthening accountability, infrastructure outcomes and income security. The VB G-RAM G Act, 2025, represents a decisive shift in India's rural employment policy. While MGNREGS, achieved significant gains in participation, digitisation, and transparency over time, persistent structural weaknesses limited its effectiveness. The new Act builds on past improvements while addressing their shortcomings through a modern, accountable, and infrastructure-focused framework (Box XIII.1).

#### Box XIII.1: VB G-RAM G Bill 2025 - Reforming MGNREGA for Viksit Bharat

The Viksit Bharat Guarantee for Rozgar and Aajeevika Mission (Gramin) Act, 2025, is a comprehensive legislative reset that aims to modernise rural employment guarantees, strengthen accountability, and align employment creation with long-term infrastructure and climate resilience goals. The new Act represents a significant upgrade over MGNREGA, fixing structural weaknesses while enhancing employment, transparency, planning, and accountability.

Feature	MGNREGS	VB G RAM G
Days of employment	100 days of wage employment per rural household	Legal guarantee of 125 days of unskilled wage employment per rural household per financial year.
Focus of works	Multiple and scattered categories of works with limited strategic focus	Four clearly defined priority areas focusing on water security, rural infrastructure, livelihoods and works to mitigate extreme weather & disaster preparedness.

<sup>25</sup> The issue of leakages from MGNREGS Funds was also discussed in Economic Survey 2023-24, Box VII.9, Chapter 7. <https://tinyurl.com/2f6snhdt>

Unemployment Allowance	Payable if employment is not provided within the stipulated time; the Disentitlement clause existed	Payable if employment is not provided within the stipulated time, with clearer accountability; the disentitlement clauses removed, reinforcing rights-based entitlement.
Pause window	No explicit statutory 'pause window'	States are empowered to notify periods aggregating to 60 days during peak sowing and harvesting seasons when works shall not be undertaken, facilitating the availability of farm labour during peak agricultural operations.
Funding approach	Demand-based funding with unpredictable allocations	Demand-driven nature is intact. State-wise normative allocation determined on objective development parameters to ensure equity (samata), fairness (nyaysangata) and balanced regional development while addressing inter-state and intra-state disparities.
Local planning	GP planning is central.	Decentralised, participatory, bottom-up planning through Gram Sabha led Viksit GP plans, integrating convergence and infrastructure planning.

### Wage and social protection measures

The Act specifies that wages will be disbursed on a weekly basis, or at the latest within a fortnight of work completion. This timely payment mechanism protects workers' rights and reduces delays that historically affected participation.

### Administrative strengthening and capacity building

Recognising the critical role of field-level staff in ensuring MGNREGA's implementation despite limited resources, VB G-RAM G strengthens administrative capacity by increasing the administrative expenditure ceiling from 6 per cent to 9 per cent of total expenditure, supporting staffing, training, remuneration, and technical capabilities. This shift towards a professional, well-supported system is expected to improve planning, execution, and service delivery while reinforcing accountability at all levels.

### Decentralised planning and local empowerment

Planning under VB G-RAM G is grounded in local realities through Viksit Gram Panchayat Plans, which are spatially integrated with national systems such as PM Gati Shakti. GPs

continue to play a central role, implementing at least half of the work in terms of cost, with institutionalised convergence of resources and programmes. This approach enhances participatory planning, ensuring that rural development interventions are tailored to the local context, sustainable, and responsive to community needs.

### **Asset creation and national development integration**

All assets created under VB G-RAM G are aggregated into the Viksit Bharat National Rural Infrastructure Stack, ensuring a unified and coordinated development strategy. By linking local works to broader national priorities, the Act facilitates both immediate support for rural livelihoods and long-term strategic infrastructure outcomes.

### **Transparency, accountability, and monitoring**

The Act enhances transparency and accountability across the system. The Centre is empowered to investigate complaints, suspend fund releases in cases of serious irregularities, and direct corrective measures as necessary. Digital governance is being strengthened through real-time monitoring, GPS-enabled tracking of works, MIS dashboards, and weekly public disclosures. Social audits are mandated at least every six months, and GPs will play a more prominent role in ensuring visibility and community participation. Central and State Steering Committees provide continuous guidance, oversight, and coordination, while digital tools, such as biometric authentication and AI-enabled monitoring, facilitate early detection of irregularities.

### **Financial sustainability**

The Act's financial architecture ensures predictable funding while limiting undue burden on states. Normative funding allocations, coupled with cost-sharing mechanisms and additional support during disasters, provide a sustainable fiscal framework. Strong oversight and accountability mechanisms further reduce the risk of misappropriation, promoting efficient use of public resources.

By expanding guaranteed employment, prioritising high-impact works, strengthening administrative capacity, and embedding strong digital governance, VB GRAM G positions rural employment as a strategic instrument for sustainable development. It aligns local livelihoods with national priorities, strengthens institutional capacity at all levels, enhances accountability and transparency, and supports the creation of climate-resilient infrastructure.

## **Driving last-mile impact through community participation**

13.27. India's extraordinary diversity, encompassing languages, cultures, castes, and geography, is not only a defining characteristic but also a profound strength, particularly in the context of rural development. Harnessing this diversity through community participation creates a powerful engine for inclusive growth and sustainable rural transformation. Over time, governance has evolved from centralised models (top-down) to more decentralised (bottom-up), people-centred frameworks. The

73rd Constitutional Amendment (1992) institutionalised Panchayati Raj Institutions (PRIs) as vehicles for grassroots democracy and laid an institutional framework for communities to engage actively in planning and executing development initiatives.

13.28. National programmes, such as MGNREGS, DAY-NRLM, SBM, and Jal Jeevan Mission (JJM), have embedded participatory approaches, empowering communities to shape development through local bodies, self-help groups (SHGs), and grassroots organisations. Initiatives like Kerala's Kudumbashree, Maharashtra's Participatory Irrigation Management (PIM), and the Northeast's NERCORMP demonstrate how local involvement drives inclusive and sustainable outcomes.<sup>26</sup> This, in effect, is the concept of Jan Bhagidari, or public participation, which provides a practical blueprint for narrowing the disconnect between the state and its citizens while building inclusivity from the ground up. Jan Bhagidari is supported by an inclusive policy design, emphasising that every individual has the right and responsibility to contribute to economic and social progress. This engagement can be facilitated through technology-driven participation, strengthened community institutions that harness social capital, capacity building, skill development, rural infrastructure development, rural well-being initiatives, or participatory budgeting/planning.

### Technology-driven participation

13.29. Technology serves as a powerful catalyst for inclusivity, breaking down barriers and broadening access for everyone. Innovations like advanced mobile phones, satellite internet, and digital tools for agriculture are helping to close the 'digital divide', bringing vital services to even the most remote areas. The recent Comprehensive Modular Survey: Telecom 2025 confirms the positive trend.<sup>27</sup>

13.30. Schemes like Survey of Villages Abadi and Mapping with Improvised Technology in Village Areas (SVAMITVA) and Namoo Drone Didi are potent examples of how technology can foster inclusivity in village life. SVAMITVA utilises drone technology to map rural properties and issue legal ownership cards, granting villagers clear property rights, reducing land disputes, and facilitating access to bank loans and government schemes, benefits that were previously out of reach. Namoo Drone Didi, by training rural women to operate drones for agricultural and land mapping tasks, not only boosts local livelihoods and skills but also empowers women to participate in the digital economy.

13.31. As of December 2025, the drone survey under SVAMITVA has been completed in 3.28 lakh villages, against a target of nearly 3.44 lakh villages notified for drone

---

<sup>26</sup> North Eastern Regional Community Resource Management Programme for Upland Areas

<sup>27</sup> CAMS-Telecom 2025 was conducted as a part of the 80th Round of NSS Survey during January-March 2025  
<https://tinyurl.com/ycke3t87>

survey. 2.76 crore property cards have been prepared for nearly 1.82 lakh villages.<sup>28</sup> Lead Fertiliser Companies distributed 1,094 drones to SHG Drone Didis in 2023-24 using their own resources, with 500 of these drones provided under the Namo Drone Didi Scheme.<sup>29</sup>

13.32. Additionally, the government has been implementing the computerisation and digitisation of rural land records since FY08 through the Digital India Land Records Modernisation Programme (DILRMP), and substantial progress has been made over the years. The goal is to maintain good-quality land records, which will, in turn, improve the quality of life for citizens. At the all-India level, digitisation of Record of Rights (RoRs) in rural areas has been completed to the extent of 99.8 per cent of available land records. Registration of land and property has also been computerised under DILRMP to the extent of 95.73 per cent of Sub Registration Offices (SROs). Unique Land Parcel Identification Number (ULPIN)/Bhu-Aadhaar has been assigned to 36.67 crore land parcels to date.

13.33. Building on technology-enabled schemes, villages can be converted into smart, intelligent villages, shifting from programme-based interventions to an integrated, village-based approach. Technologies can be leveraged holistically to support rural development, enhancing the quality of life, strengthening local economies, and empowering communities. For example, in Satnavari Smart Village, Maharashtra, farmers receive AI-powered alerts on soil, crops, and weather conditions. Smart irrigation operates on solar energy with predictive insights, while shared community drone spraying of fertilisers and dashboards ensure transparent governance. Students can learn via AI-driven modules and digital labs, and villagers can access instant telemedicine and e-health records.<sup>30</sup>

13.34. The Rural Technology Action Group (RuTAGE) Smart Village Centre (RSVC), inaugurated in Mandaura village, Sonipat, establishes a permanent hub at the Panchayat level to support 15-20 villages with 12 technology tracks, including internet-of-things (IoT) for water monitoring, satellite agri-data, solar power, waste management, FinTech apps and custom solutions like animal intrusion prevention and electronic medical record-keeping are based on local needs. It fosters community adoption through innovations, local entrepreneurs, and collaborations with Krishi Vikas Kendras and NRLM for scalable rural progress. This model aims to bridge the rural-urban divide by handholding grassroots tech deployment nationwide.<sup>31</sup>

13.35. Community participation and technology-enabled engagement can further

28 PIB release of M/o Panchayati Raj dated 29 December 2025: <https://tinyurl.com/3edmdd7z>

29 PIB release by M/o Agriculture & FW dated 1 August 2025 <https://tinyurl.com/nhzhfenp4>

30 <https://villagesquare.in/satnavari-village-smarter-than-most-indian-cities/>

31 PIB release dated 15 February 2025: <https://tinyurl.com/5n8ne4c6>

enhance the governance of village commons, which remain a crucial yet underutilised asset where local institutions, digital tools, and livelihood generation intersect to support sustainable rural transformation.

### **Village Commons in India: Need for a fresh approach**

13.36. Village commons in India, also known as Common Property Resources (CPR), are traditionally community-managed shared resources that include grazing fields, ponds, water bodies, and other areas collectively used by villagers for fodder, fuel, cane crushing, water, and livelihood. CPRs were first defined by the National Sample Survey Organisation in its 1998 survey, 'Common Property Resources in India' (54th Round, 1998-99), which indicated that approximately 15 per cent of India's geographical area comprises village commons.<sup>32</sup>

13.37. The 2011 Census estimates India's common land to be approximately 6.6 crore hectares, which form biodiversity-rich ecosystems.<sup>33</sup> These ecosystems provide 34 different services that support the livelihoods of approximately 35 crore rural people by supplying them with food, fodder, fuelwood, timber, organic manure, and seeds, as well as non-material benefits such as clean air, water purification, soil retention, carbon sequestration, and flood control. Such ecosystems generate an economic dividend of USD 9.05 crore per year, while also making significant contributions to the Sustainable Development Goals (SDGs), including the reduction of poverty (SDG 1), achieving sustainable livelihoods (SDG 8), and promoting environmental stewardship (SDG 15).<sup>34,35</sup>

13.38. Although village commons provide important economic benefits, their value is often underestimated, and they have gradually deteriorated due to encroachment, misuse, and ongoing pressures. According to Indian Space Research Organisation's (ISRO) satellite-based observational study, Desertification and Land Degradation Atlas, degraded land expanded from 94.53 million hectares (28.8 per cent of geographical area) during 2003-05 to 96.40 million hectares (29.3 per cent) during 2011-13 to 97.85 million hectares (29.8 per cent) by 2018-19, adding roughly 2.2 lakh hectares annually.<sup>36</sup> The degradation has led to declining yields, increased cultivation costs, depleted water tables, shrinking forests, and the unregulated use of pastures. Non-availability of sewage treatment plants in villages has added another layer of complexity.

32 NSSO (1999). Common Property Resources in India. NSS 54th Round (January 1998–June 1998), Report No. 452 (54/31/4) (Table T1). <https://tinyurl.com/48xamx6r>.

33 IFPRI (2021) The crucial value of India's common lands <https://tinyurl.com/kbpptntn>

34 Sandhu, H. et al 2023 The value of Indian commons Environ. Res. Lett. 18 013001 <https://tinyurl.com/bddudxj2>

35 Prince Solomon Devadass, B., Sudharsan, S., Enoch, A., & Rachel, S. (2025). Common Property Resources as Drivers of the SDGs: Asset Creation and Revenue Generation in Vellaputhur Village, Tamil Nadu. *Lex Localis- Journal of Local Self-Government*, 23(S6), 6989–6990. <https://tinyurl.com/hbjt95e6>

36 ISRO, Desertification and Land Degradation Atlas 2021. <https://tinyurl.com/2wchy92n>

13.39. The social and economic consequences of the degradation of common land are felt most acutely in rural areas, whose livelihoods are directly tied to their environment. To address this issue, the government has launched several restoration programmes like Mission Amrit Sarovar, to rejuvenate the village water bodies and SVAMITVA Yojana to map village commons and private properties, among many others.<sup>37,38</sup> Village pond rejuvenation is being advanced through a combination of national initiatives, notably the Repair, Renovation, and Restoration of Water Bodies under the PM Krishi Sichai Yojana - Har Khet Ko Pani and the Jal Shakti Abhiyan: Catch The Rain, which together focus on restoring and sustaining traditional water bodies.<sup>39</sup>

13.40. Protecting village commons in India aligns with Elinor Ostrom's principles for sustainable management of common-pool resources.<sup>40,41</sup> These encompass clearly defined boundaries for resources and users; congruence of local rules with conditions; participatory rule modification for resource use; monitoring by community-accountable officials; graduated sanctions for violating rules; low-cost conflict resolution; autonomy for local institutions; and multiple interconnected layers of nested organisations, from small local groups at the base up to broader regional or higher-level bodies. When combined with tools such as GIS-based registries and targeted capacity building, this framework can both arrest degradation and enable rejuvenation of commons through interventions like solarisation and waste-to-energy projects.

13.41. Reviving and protecting village commons, therefore, requires a collaborative approach that involves both the government and local communities actively participating. To achieve this, first, 'village commons' as a distinct land-use category may need official incorporation with sub-categories, so that accurate estimation, monitoring, and informed policy intervention can be undertaken. At the state level, Karnataka and Rajasthan demonstrate how multi-tiered institutions can effectively systematise the mapping, documentation, and maintenance of databases on common natural resources, thereby enhancing the accuracy of village identification and management of commons.<sup>42</sup> Second, with community participation, solarisation, and the establishment of sewage treatment plants that utilise village waste (such as plastic), effective use of village commons can be achieved. This will address both land degradation and environmental concerns and rebuild their ecological and livelihood functions. Third, a well-structured capacity-building effort for local body officials working in and

37 Mission Amrit Sarovar: <https://amritsarovar.gov.in/login>

38 PIB release of MoPR dated 3 December 2025: <https://tinyurl.com/ywfhjk5>

39 PIB release of the Ministry of Jal Shakti dated 11 December 2025: <https://tinyurl.com/3sumbs4m>

40 Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge, MA: Cambridge university press. DOI: <https://doi.org/10.1017/CBO9780511807763>

41 Ostrom, E. (2005). *Understanding institutional diversity*. Princeton, NJ: Princeton university press. DOI: <https://doi.org/10.2307/j.ctt7s7wm>

42 Chandran, N., & Singh, C. (2023). What a national registry can do for India's common lands. *IDR (India Development Review)*. <https://tinyurl.com/bdevpc49>

related to rural areas would be beneficial. This can be achieved through institutions such as National Institute of Rural Development and Panchayati Raj (NIRD&PR), State Institutes of Rural Development (SIRDs), Extension Training Centres (ETCs), and Rashtriya Gram Swaraj Abhiyan (RGSA) trainings, which equip officials with the skills necessary for the participatory rejuvenation of village commons through solarisation, waste-to-energy systems, and sustainable management.

13.42. Reviving village commons is crucial for rural India's economy and the livelihoods of its people. These shared resources support the daily needs and incomes of millions of families, while also conserving biodiversity and providing essential ecosystem services, such as water security and soil protection. Restoring and protecting the commons can strengthen rural livelihoods, safeguard nature, and unlock significant economic value, making them central to sustainable and inclusive development.

### **Harnessing social capital for livelihood**

13.43. India is on the cusp of a major socio-economic transformation. It has emerged from a period of rapid growth, and sustaining it is both a challenge and an opportunity. With around 26 per cent of the population in the 10-24 age group, India's youth bulge demands jobs, enterprises, or both. Employment and entrepreneurship, in turn, ride on appropriate skills and education.<sup>43</sup> The search for jobs and a better life drives rural-to-urban migration, with nearly one in four rural Indians (26.8 per cent) being a migrant in 2020-21, and nearly 39 per cent of males migrating for employment reasons.<sup>44,45</sup>

13.44. Urban India and peri-urban areas attract migrants seeking better education, health, livelihoods, services, entertainment, and perceived well-being, viewing living in the city as a success. However, cities may be reaching capacity limits, and continuous migration is unsustainable, with approximately 65 per cent of the population still residing in rural areas.<sup>46</sup> This rural-urban shift has side effects: as youth seek work in cities, support for older people diminishes, impacting their physical and mental health.

13.45. Amid these migration pressures, the path to sustainable progress lies in revitalising the rural economy by making rural communities more resilient and self-reliant. This can be achieved by incubating and strengthening self-sustaining rural enterprises, alongside skill development that generates local livelihoods and opportunities.

---

43 The United Nations Population Fund's (UNFPA) State of World Population - 2024 report – 'Interwoven Lives, Threads of Hope: Ending Inequalities in Sexual and Reproductive Health and Rights' at pg 148 <https://tinyurl.com/46kr4n5r>

44 Multiple Indicator Survey in India (MoSPI 2023) Statement 31 & 33 <https://tinyurl.com/5henppxn>

45 Statement 7: Percentage distribution of migrants by reason for migration from PLFS 2020-21 <https://tinyurl.com/5emtunar>

46 World Bank staff estimates based on the United Nations Population Division's World Urbanisation Prospects: 2018 Revision. <https://tinyurl.com/4ayewxej>

13.46. Inclusive rural growth, in turn, depends on strengthening local institutions, improving access to education and healthcare, fostering entrepreneurship and innovation, preserving common resources, and reinforcing cultural knowledge systems and community pride. Such an approach also helps address distress-driven urban migration. Central to this is the need to operationalise social capital by converting community trust and networks into sustainable livelihood outcomes. Achieving these outcomes requires active stakeholder engagement and community participation, and several government initiatives are designed around these pillars. One such initiative is the DAY-NRLM.

13.47. It aims to reduce poverty by enabling poor households to access gainful self-employment and skilled wage employment opportunities, resulting in sustainable and diversified livelihood options for the poor. The Mission seeks to achieve its objective through investing in four core components, viz., (a) social mobilisation and promotion and strengthening of self-managed and financially sustainable community institutions for the rural poor women; (b) financial inclusion; (c) sustainable livelihoods; and (d) social inclusion, social development and access to entitlements through convergence.

13.48. The core of DAY-NRLM is its community-driven approach, which empowers rural women by building their capacities, providing financial support, and offering training to enhance their livelihoods and promote self-reliance. Key to implementation are community resources, such as social capital, specifically, trained SHG members who act as Community Resource Persons (CRPs) in thematic areas like agriculture, banking, insurance, and nutrition. With over 9 lakh CRPs active at the grassroots, the mission's federations give women a collective voice and agency. The goal is that families in the SHG network, for 6-8 years, achieve food security and multiple stable income sources, sustainably transforming rural livelihoods.

**Table XIII.1: Key data points**

Indicator	Cumulative progress
No. Of Blocks covered	7156
No.of SHGs promoted (in lakh)	90.90
No. of Households mobilised (in crore)	10.05
Capitalisation Support provided to SHGs (in ₹crore)	62453.85
Amt. of Bank credit accessed by SHGs (in ₹ lakh crore)	11.92
Number of individual enterprises set up under Startup Village Entrepreneurship Programme (in lakh)	4.02
Number of vehicles deployed under Aajeevika Grameen Express Yojana	2300
Number of Mahila Kisan covered (in crore)	4.92
Number of Custom Hiring Centres established	36,205
Number of households promoting agri-nutri gardens (in crore)	3.34
Source: M/o Rural Development (Till December 2025)	

**Table XIII. 2 NRLM: Empowering Rural communities - From SHGs to Lakhpati Didis**

 <p><b>1.49 lakh</b> ‘<b>Bank Sakhi</b>’ women delivering financial services.</p> <p><b>9 lakh trained</b> CRPs help with livelihood, health, and market interventions.</p>	 <p><b>3.95 lakh new rural businesses</b> drive non-farm enterprises.</p> <p>Enhanced connectivity under <b>Aajeevika Grameen Express Yojana</b>.</p>	 <p>Social inclusion driven by <b>5,500 Gender Resource Centres</b> &amp; <b>35 lakh Gender Point Persons</b></p>	 <p><b>Saras &amp; Aajeevika Brand: Path to 3 Crore Lakhpati Didis</b></p> <p>Marketing support + Dedicated stores + e-commerce tie-ups</p>
--	--	---	--

### Skilling initiatives

13.49. While employment is a major driver of migration in rural areas, the creation of local livelihood opportunities alone is insufficient to build self-reliant villages. Equally critical is the development of a skilled workforce. Skill development programmes play a key role in empowering individuals by enhancing employability, supporting local economic activity, and contributing to broader social development. The Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) is a skilling and placement initiative under the DAY NRLM.

13.50. DDU-GKY is a state-led scheme being implemented in public-private partnership (PPP) mode, based on a demand-driven target sanction process. The programme occupies a unique position among other skill training programs, due to its focus on financially vulnerable rural youth and its emphasis on sustainable employment through the prominence and incentives given to post-placement tracking, retention, and career progression. To ensure quality adherence, DDU-GKY mandates independent third-party certification, through Sector Skill Councils (SSC) of National Skill Development Corporation (NSDC), of every trainee to assess the skill, knowledge, and attitude of each trainee.

13.51. Complementing the DDU GKY, the Rural Self-Employment Training Institutes (RSETIs) Programme is a unique PPP initiative implemented through sponsor banks in collaboration with state governments. The programme aims to build a dedicated skill infrastructure in each district of the country for upskilling rural youth, particularly those from Below Poverty Line (BPL) and DAY-NRLM households, geared towards

entrepreneurship development. Currently, 629 RSETIs are operational across 616 districts in 33 states/UTs, supported by 25 financial institutions, forming a pan-India network of skill development and livelihood promotion centres that complements national efforts toward Atmanirbhar Bharat.

### Capacity building for better governance

13.52. Capacity building is key to sustaining the development momentum in rural India. Local institutions, such as GPs, play a crucial role in decentralised governance by facilitating community participation, decision-making, and grassroots development. Strengthening their capacities through essential skills, such as planning, financial management, and leadership, and resources like training modules and digital tools, enhances institutional efficiency, local governance, and service delivery. To this end, the government implements a broad range of initiatives, focused on training programmes, digital governance platforms, institutional strengthening, and promoting community participation.

13.53. Various government institutions, such as NIRD&PR, SIRDs, and ETCs, offer targeted training to officials and Panchayat leaders. The NIRD&PR excels in training, research, and consultancy on rural development and Panchayati Raj. As a knowledge repository and government think tank, it builds the skills/attitudes of officials/non-officials through training, workshops, and seminars focused on the rural poor. The SIRDs train rural officials, functionaries, and elected representatives of PRI, and the ETCS impart training to village and block-level developmental functionaries

13.54. In addition to these institutions, the centrally sponsored scheme RGSA, launched in April 2018, strengthens PRIs to achieve Sustainable Development Goals (SDGs), emphasising convergence with Mission Antyodaya and a special focus in Aspirational Districts. Revamped in 2022, the scheme reimagines PRIs as vibrant centres of self-governance and economic growth, focusing on grassroots SDG localisation through thematic convergence, collaborative efforts between central and state governments, and a 'whole-of-government' approach. In FY25, more than 35 lakh participants have been trained under the RGSA scheme.

13.55. To enhance digital governance, the e-Panchayat Mission Mode Project of the government is digitising planning, budgeting, and service delivery through platforms like e-Gram Swaraj.<sup>47</sup> The project seeks to transform the functioning of PRIs, making them more transparent, accountable and effective as last-mile cutting-edge institutions of decentralised local self-governments. The e-Gram SWARAJ portal, launched in April 2020, provides a single window with the complete Profile of the GP, including details

<sup>47</sup> <https://egramswaraj.gov.in/>

of Sarpanch/Secretary, demography, finances, assets, activities taken up through the Gram Panchayat Development Plan (GPDP), and relevant information from Census 2011, SECC (Socio Economic and Caste Census) data, Mission Antyodaya survey report, etc. The portal acts as a unified interface that enhances the reporting and tracking of Panchayat activities. It decentralises the planning process to ensure development funds lead to effective outcomes.

13.56. Further, integration with the Public Financial Management System (PFMS) ensures secure, real-time payments, and AuditOnline enables transparent online audits.<sup>48</sup> So far, 2.54 lakh GPs have prepared and uploaded their GPDP for FY25 on e-Gram SWARAJ. Till October 2024, 2.21 lakh GPs or equivalent bodies (including Traditional Local Bodies) have carried out online transactions to the tune of ₹2,77,784 crore (since inception).

13.57. AI tools like SabhaSaar strengthen participatory democracy and local governance efficiency by reducing the time and effort required for manual documentation. As of November 2025, about one lakh GPs in 31 states/UTs conducted 1.38 lakh Gram Sabhas and generated automatic minutes of the meetings through SabhaSaar.<sup>49</sup>

13.58. Along with building GP capacities, it is essential to assess development at the Panchayat level. The Panchayat Advancement Index (PAI) of the Ministry of Panchayati Raj (MoPR) assesses the overall holistic development, performance & progress of over 2.5 lakh GPs across India.<sup>50</sup> This assessment helps identify shortfalls, needed capacities, and improvement strategies. This initiative advances the vision of building vibrant PRIs as hubs of governance and growth through competitive federalism, motivating officials to deliver better services while boosting community participation. The index is discussed in detail in Box XIII.2.

### Box XIII.2: Panchayat Advancement Index: A composite tool to track local SDG progress

GPs serve as the initial point of contact between citizens and governance in rural areas. Their proximity to local communities enables them to identify area-specific needs, prioritise development interventions, and ensure efficient utilisation of resources. GPs play a pivotal role in implementing government schemes and are central to achieving the SDGs at the grassroots level. Institutional mechanisms such as GPDPs, Gram Sabhas, and participatory budgeting frameworks strengthen participatory governance by contextualising national

<sup>48</sup> AuditOnline is an application rolled under the e-Panchayat Mission Mode Project by M/o Panchayati Raj.

<sup>49</sup> SabhaSaar is an AI-enabled application which makes Gram Sabha documentation faster, easier, and in a structured format.

<sup>50</sup> PIB release by MoPR dated 9 April 2025: <https://tinyurl.com/5n8acuyc>

priorities, including the SDGs, within local development processes. Further, policy instruments such as the Panchayat Advancement Index (PAI) support local governments in monitoring performance and adopting evidence-based policy actions.

PAI is a composite, multi-domain index developed by the MoPR to systematically measure and monitor the progress of over 2.5 lakh GPs in achieving Localised Sustainable Development Goals (LSDGs).<sup>51</sup> It is built on 435 unique local indicators (331 mandatory and 104 optional) mapped to 566 data points. The indicators are aligned with the National Indicator Framework of MoSPI and organised across nine LSDG themes: poverty-free and enhanced livelihoods (32 indicators), healthy panchayat (21), child-friendly panchayat (82), water-sufficient panchayat (21), clean and green panchayat (33), self-sufficient infrastructure (159), socially just and socially secured panchayat (62), good governance (62), and women-friendly panchayat (44).

The PAI captures the multidimensional nature of rural development by using localised indicators that reflect social, economic, environmental and governance outcomes at the GP level. Each of the nine LSDG themes is operationalised through specific indicators. The granular indicator design ensures that global SDG targets are translated into measurable, locally relevant metrics that Panchayats can act upon through planning and convergence.

At its core, PAI is a performance measurement and ranking framework for GPs. By aggregating information across key dimensions of rural life under the nine themes, PAI acts as an effective instrument to assess areas that need more attention to ensure the effective utilisation of limited resources.

### **Role of PAI in Evidence-Based Planning**

A central purpose of PAI is to use indicator-based scores to identify development gaps across themes and guide evidence-based GPDPs. By combining granular indicators with a transparent scoring and categorisation framework, PAI promotes healthy competition among Panchayats and encourages them to improve governance quality, service delivery and development outcomes. The index also offers policymakers at all levels, from State Governments and Members of Parliament to central ministries, a structured, indicator-based tool to assess ground-level SDG progress, refine schemes, and strengthen convergence around the LSDG themes.

## **Rural infrastructure**

13.59. Strong infrastructure, including roads, housing, tap water connections, and digital connectivity, has been vital for inclusivity, as it links communities to markets, services, and opportunities that enhance the quality of life. Additionally, among the poor, housing plays a crucial role in enhancing the quality of life and facilitating their participation in the economy.

<sup>51</sup> <https://pai.gov.in/>

13.60. Rural Connectivity is one of the key components in rural development and contributes crucially towards alleviating poverty. A high-quality all-weather road contributes to generating additional agricultural incomes, promoting productive employment, and improving access to health, education, and other essential services. Keeping that in view, the government launched Pradhan Mantri Gram Sadak Yojana (PMGSY) (referred to as PMGSY-I) on 25 December 2000 with the primary objective of providing all-weather road connectivity to the eligible unconnected habitations in rural India (500 persons and above in plains & 250 persons and above in hilly and NE areas as per the 2001 census). As of 15 January 2026, more than 99.6 per cent of eligible households have been provided with connectivity. Moreover, under PMGSY-I, 1,64,581 roads (6,44,735 km) & 7,453 bridges have been sanctioned, and 1,63,665 roads (6,25,117 km) & 7,210 bridges have been completed. Building on PMGSY-I, PMGSY-II was launched in 2013 to consolidate the existing Rural Road Network, improving its overall efficiency as a provider of transportation services for people, goods, and services. Under PMGSY-II, 6,664 roads (49,791 km) & 759 bridges have been sanctioned and 6,612 roads (49,087 km) & 749 bridges have been completed as of 15 January 2026.

13.61. The Government approved PMGSY Phase III in July 2019 for the consolidation of 1,25,000 km of routes and major rural links connecting habitations, inter alia, to Gramin Agricultural Markets (GrAMs), higher secondary schools, and hospitals. Under PMGSY-III, 15,965 roads (1,22,363 km) & 3,211 bridges have been sanctioned and 12,699 roads (1,02,926 km) & 1,734 bridges have been completed of 15 January 2026.

13.62. In a significant move towards achieving the sustainable rural infrastructure and circular economy goals of the SBM-Grameen Phase II, Chhattisgarh has constructed its first plastic waste-mixed bituminous road in Bastar district, marking an innovative milestone with potential for wide-scale replication. This 5.5-kilometre road, constructed under the PMGSY scheme between Kawapal and Kalguda GPs in Jagdalpur tehsil, includes 1.2 kilometres laid using non-recyclable plastic waste, blended with bitumen. This marks a first-of-its-kind initiative in the region, setting an example for environmentally responsible rural development. It embodies the 'Waste to Wealth' vision of SBM-Grameen Phase II by converting sanitation-linked plastic waste into productive rural infrastructure, particularly in a remote tribal belt. Beyond connecting two villages, it connects rural livelihoods with sustainability and demonstrates a scalable circular economy model that can inform similar efforts across rural India, paving the way for a cleaner, greener, and more prosperous future.

13.63. The Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN) scheme targets 75 Particularly Vulnerable Tribal Groups (PVTGs) in 18 states and one UT, aiming for 100 per cent saturation of government schemes in 28,700 PVTG habitations, covering approximately 48.22 lakh individuals (12.28 lakh households).

Under PM-JANMAN, 2,495 roads (7,324 km) & 164 bridges have been sanctioned, and 263 roads (1,314 km) have been completed as of 15 January 2026.

13.64. Additionally, the government has initiated the Dharti Abha-Janjatiya Gram Utkarsh Abhiyan (DA-JGUA) scheme in convergence with the PMGSY-IV. The initiative, covering more than 63,000 tribal villages, focuses on improving access to clean water, housing, education, healthcare, and sustainable livelihoods.

13.65. The environment is central to the sustainability and well-being of tribal communities residing in villages, often located in ecologically sensitive and resource-rich areas. Environmental sustainability is strengthened through the Pradhan Mantri Janjatiya Vikas Mission (PMJVM), which fosters tribal entrepreneurship and sustainable use of natural resources, especially Minor Forest Produce (MFP). Under the PMJVM, 4105 Van Dhan Vikas Kendras have been established, benefiting approximately 12 lakh people across 28 states/UTs. The Forest Rights Act 2006 has enabled the distribution of 23.92 lakh individual and 1.22 lakh community titles, covering 233.48 lakh acres, reinforcing community stewardship over forests and resources.

13.66. India's tribal areas present a significant opportunity for green economic development due to several factors. The tribal population in the country is significant, with approximately 1.45 lakh tribal villages, and tribals make up about 8.9 per cent of the total population, predominantly residing in biodiverse forests and hilly regions.<sup>52,53</sup> These Tribal communities possess valuable, sustainable traditional knowledge that supports biodiversity and reliance on forest resources. The economic value of the Natural Services provided by India's forests is estimated to be worth a substantial ₹128 trillion per year, highlighting the significant economic potential of these ecosystems (Krishnan, A., 2020).<sup>54</sup> Yet, biodiversity science and its connections to human well-being in India remain largely unexplored. Box XIII.3 presents how effective integration of traditional knowledge, digital infrastructure and community engagement can empower tribal communities.

### Box XIII.3: Empowering tribal communities to embrace digital technologies and practices

Tribal communities, traditionally, practice agriculture but at a very primitive level of the value chain. What we see in tribal villages is an agricultural system in harmony with nature, adopting deep ecological knowledge, preserving soil and ecosystem health, and utilising

<sup>52</sup> M/o Tribal Affairs Gap analysis: <https://tribal.nic.in/GapAnalysis.aspx>

<sup>53</sup> PIB release of the M/o Tribal Affairs dated 2 December 2022: <https://tinyurl.com/zxurk5ew>

<sup>54</sup> Krishnan, A. 2020. National mission on biodiversity and human well-being: for a greener, healthier and more sustainable way of life. <https://tinyurl.com/yjvt8a7u>

mixed farming, crop rotation, water management, and the use of local resources, while meeting the food and nutrition needs of the tribal community. Atmanirbharta (self-reliance) has been the lifestyle of tribal communities in India since time immemorial, and it is a historically accurate and visible phenomenon.

Hence, the relevance of this eco-friendly, zero-fossil-fuel system has increased further in times of climate change and erratic weather. India's green economy and tribal farming practices, while facing significant challenges, possess a huge potential for a sustainable future.

Supporting smart tribal farming practices, through technological assistance, policy support, and financial investment, can lead to the scaling up of a viable green agricultural model for India and potentially the Global South. This can be achieved through locally appropriate interventions, efficient resource utilisation, and community ownership, addressing the structural constraints faced by tribal farmers. Across multiple states, grassroots initiatives demonstrate how tribal agriculture can be revitalised by blending indigenous knowledge with appropriate, low-cost technologies and institutional support. The experience from Odisha illustrates the practical application of this approach. Since 2023, the Strengthening of Livelihoods of a Rural Tribal Farmer initiative has been led by Odisha's Soil Conservation and Watershed Development Department in the Gajapati district.<sup>55</sup> Key interventions include excavating around 200 individual farm ponds and four cluster ponds for rainwater harvesting and year-round irrigation, alongside awareness drives for integrated farming systems that blend crops, poultry, aquaculture, horticulture, and modern drip/sprinkler technology for irrigation. This initiative is supported by a multi-departmental convergence for infrastructure, inputs, training, and market linkages. The initiative led to an increase in annual income of households from ₹1,500 to nearly ₹90,000, strengthened livelihoods, reduced distress migration, and renewed youth interest in farming.

In Madhya Pradesh, NGOs and Krishi Vigyan Kendras (KVKs) have played a central role in reviving traditional agrobiodiversity and improving productivity through frontline demonstrations and community seed banks. For example, community-run seed banks in Jhabua are helping tribal farmers.<sup>56</sup> They promote household-level seed collection, structured seed exchange, and local seed multiplication, enabling farmers to re-adopt traditional and organic farming practices while reducing dependence on external seed markets. The initiative is supported by farmer training, the formation of seed producer groups, and the use of simple documentation tools.<sup>57</sup>

Complementing these community-driven models are solar irrigation cooperatives that enable year-round cultivation and crop diversification. A similar initiative in Jharkhand enabled Oraon farmers to cultivate vegetables, thereby reducing the need for seasonal migration. Combined with mobile agro-advisory services that integrate local crop calendars

<sup>55</sup> Ministry of Tribal Affairs, Government of India. Strengthening of livelihoods of a rural tribal <https://tinyurl.com/yck9b97c>

<sup>56</sup> Manan Deva, A. (2025). Rooted Technologies: How Tribal Farmers Are Merging Traditional Knowledge with Agri-Tech for Climate Resilience. *Social Innovations Journal*, 31. <https://tinyurl.com/pdfn72eu>

<sup>57</sup> Community seed banks: <https://samparkmp.org/community-seed-bank/>

with timely weather and pest information, this would enable yield stabilisation.<sup>58</sup> Together, these approaches point to an 'indigenous agri-tech' paradigm, where the integration of indigenous knowledge with technology can significantly enhance the livelihoods of tribal farmers.

In this context, a proactive and development initiative has been in visualising a Smart Tribal Farming Initiative - A digital transformation of agriculture in tribal areas for manifold tribal farmers' income, as a pilot project in a cluster of 10-15 tribal villages in various Districts of India, in association with NGOs working with tribal communities and higher educational institutions with digital infrastructures.<sup>59</sup> The initiative is built on developing a comprehensive digital tribal agriculture mission that transforms tribal farming and allied sectors through digital commodity value chains, climate and risk management advisories, data-driven soil and health management through a digital agriculture resource information system, digitally mapped 'twin' villages, validated indigenous practices, and support for sustainable natural farming.

India's tribal regions hold ecological, cultural, and economic potential. A coordinated policy that promotes smart tribal farming through targeted investments, digital tools, capacity building, and community ownership can transform tribal farming from a subsistence activity to a key component of sustainable rural development.

13.67. With the aim to achieve the objective of 'Housing for All', the Pradhan Mantri Awaas Yojana -Gramin is being implemented w.e.f. 1 April 2016 with the aim of providing 4.95 crore pucca houses with basic amenities to all eligible houseless households living in kutcha and dilapidated houses in rural areas by 2029. A total target of 4.14 crore houses has been allocated to states/UTs, out of which 3.86 crore have been sanctioned, and 2.93 crore have been completed so far. Further, 76.98 lakh houses pending from earlier schemes were also completed, which takes the overall completion of houses in rural areas in the last 11 years to 3.70 crore.

13.68. To meet the aspiration for 'Har Ghar Jal' in rural areas, the government has been implementing the Jal Jeevan Mission (JJM) since August 2019 in partnership with the states. At launch, only 3.23 crore (17 per cent) rural households had tap connections. By 20 November 2025, over 12.50 crore more households were covered, increasing total coverage to about 15.74 crore (81.31 per cent), improving the living standards of rural households. JJM has delivered transformative social and health outcomes, as evidenced by independent assessments. SBI Research reports a sharp decline in women fetching water from outside homes, boosting participation in agricultural and allied activities.<sup>60</sup> The World Health Organisation (WHO) estimates daily time savings of over 5.5 crore

<sup>58</sup> Ibid note 56 above

<sup>59</sup> Led by Shobhit University, Meerut (<https://tinyurl.com/4nphz9mp>) In Kerala, Tamil Nadu, Andhra Pradesh, Telangana, Karnataka, Maharashtra, Madhya Pradesh, Jharkhand, Chhattisgarh, J&K, Uttar Pradesh, Odisha, Assam and Manipur

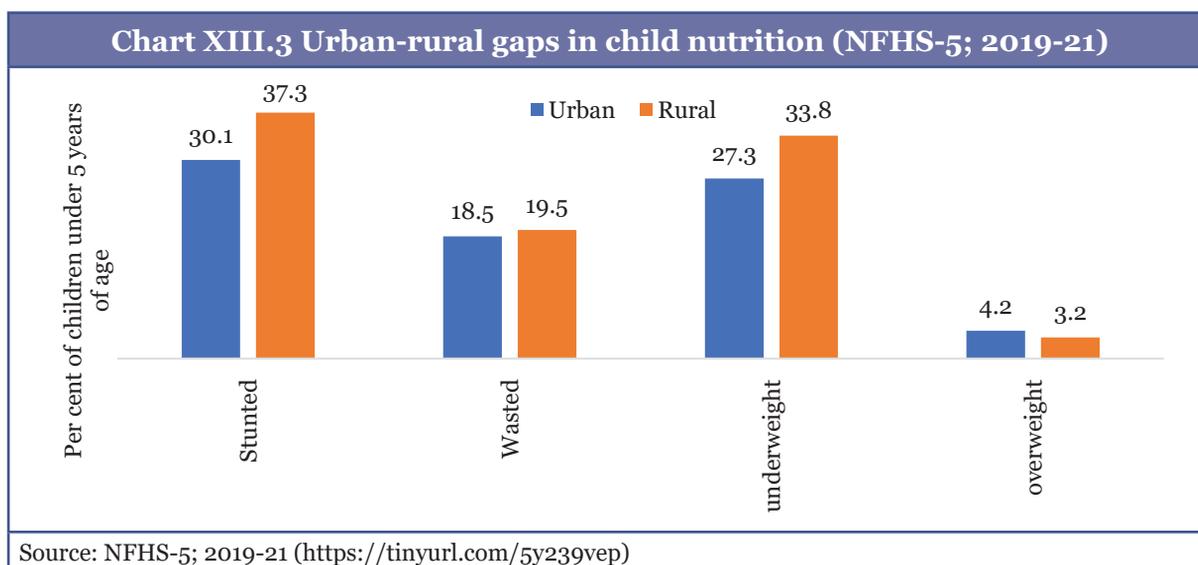
<sup>60</sup> SBI Research. (18 October 2024). Social fabrics: <https://tinyurl.com/yh8f48e3>

hours, the prevention of nearly 4 lakh diarrhoeal deaths, and savings of approximately 14 million DALYs.<sup>61</sup>

13.69. These health gains from JJM show how rural infrastructure directly affects rural well-being. Beyond economic benefits, schemes like PM GSY, SBM-Grameen, and JJM are vital for rural health, reducing disease burden from unsafe water and poor sanitation, and improving access to healthcare.

## Rural wellbeing

13.70. Investment in improving health infrastructure has improved the availability of health services in rural areas. It is essential that this improvement translates into better outcomes for people, including their health, nutrition, and overall well-being, for development to be truly effective. Chapter 11 of the Survey discusses the progress of various health initiatives by the government, highlighting gains in service coverage and access. At the same time, while child nutrition indicators such as stunting, wasting, and underweight have improved over time, the urban-rural gap remains a challenge.



13.71. In Chapter 11, Box XI.9 discusses how social and behavioural change communication (SBCC) strategies can improve scheme outcomes for pregnant and lactating mothers and children by promoting appropriate diets and child feeding practices. SBCC for caregiver education and community participation can help enhance health-seeking behaviours. Evidence suggests that using a behaviour change communication approach through SHGs improves newborn care practices.<sup>62</sup>

61 PIB release dated 26 October 2025: <https://tinyurl.com/8r5x2pm3>

62 Saggurthi, N., Porwal, A., Atmavilas, Y. et al. Effect of behavioral change intervention around new-born care practices among most marginalized women in self-help groups in rural India: analyses of three cross-sectional surveys between 2013 and 2016. <https://tinyurl.com/3y64mh5t>

13.72. Telemedicine has the potential to improve health outcomes in underserved areas, especially when local community healthcare providers actively support and promote its use in rural communities. Furthermore, strengthening front-line workers led outreach by supporting ASHA<sup>63</sup>, ANM<sup>64</sup>, and AWW<sup>65</sup> to conduct regular home visits and village health days focused on maternal and newborn care, with clear training materials, communication guidelines, and technology such as mobile apps, AI chatbots, and dashboards (e.g. ASHABot<sup>66</sup>, ASHA Kirana's M-CAT<sup>67</sup> and ASHA Digital Health<sup>68</sup>) can help improve outcomes in rural areas.

### Participatory budgeting and planning

13.73. The effectiveness of rural infrastructure investments depends on effective planning, allocation, and monitoring at the local level. Participatory budgeting and strong local governance empower communities to prioritise projects, use resources efficiently, and ensure infrastructure aligns with local needs.

13.74. Despite receiving grants from the Central Finance Commission and State Finance Commissions, PRIs are unable to meet their potential and public expectations due to insufficient resources. Greater financial independence through Own Sources of Revenue (OSR) enables PRIs to make more informed decisions on expenditure, thereby improving efficiency and accountability. Improving OSR strengthens the link between revenue generation and expenditure decisions, promoting efficiency and accountability in service delivery. Several states/UTs have established rules enabling Panchayats to levy and collect taxes, duties, and fees. However, many states and UTs, such as Arunachal Pradesh, Bihar, Jharkhand, Manipur, Nagaland, Sikkim, Uttar Pradesh, Andaman & Nicobar Islands, Dadra and Nagar Haveli & Daman and Diu, Ladakh, and Lakshadweep, do not have such provisions, underscoring the need for rules to enhance local governance across the country.

13.75. Incentives such as matching grants in Andaman & Nicobar and financial rewards in Goa, along with shared mining royalties, the District Mineral Fund (DMF), and Goods and Services Tax (GST) collections, further support PRI revenues. Additionally, funds from mining royalties, the DMF, and GST are shared with Panchayats to align financial resources with local governance needs.

---

63 Accredited Social Health Activist

64 Auxiliary Nurse Midwife

65 Anganwadi worker

66 <https://tinyurl.com/23zfftzj>

67 Srinidhi V, Karachiwala B, Iyer A, Reddy B, Mathrani V, Madhiwalla N, et al. ASHA Kirana: when digital technology empowered front-line health workers. *BMJ Global Health*. 2021;6:e005039. <https://doi.org/10.1136/bmjgh-2021-005039>

68 <https://tinyurl.com/3kvabrmy>

13.76. MoPR is actively working in collaboration with the states to augment OSR generation in PRIs by facilitating the formulation of relevant rules. The Ministry has developed the Samarth application for generating and collecting tax demands at the PRI level and is collaborating with institutions like IIM-A on capacity-building modules. These OSR and technology reforms empower Gram Sabhas and Panchayats with reliable local resources, strengthening participatory budgeting, planning, and prioritisation at the grassroots level.<sup>69</sup>

13.77. In addition to participatory budgeting, SBCC initiatives play a vital role in empowering beneficiaries as drivers of desired outcomes while strengthening PRIs to achieve development goals. The Box XI.9 of chapter 11 discusses how an effective communication strategy can help drive scheme outcomes. Box XIII.4 advances this discussion.

#### Box XIII. 4 Communication for rural development and transformation

True progress in rural areas arises from community ownership rather than solely top-down approaches. Shifts in mindset transform passive residents into active participants. Communication strategies address this by sharing targeted knowledge through innovative channels and tools that enable communities to become proactive agents of lasting change. Driving behaviour change is a process, not a one-time event, requiring tailored messages and channels to move people from being unaware to adopting and maintaining new behaviours.

MoPR is spearheading SBCC campaigns through engaging digital narratives to transform grassroots governance mindsets and practices. Using the multimedia mode, the ministry partnered with The Viral Fever (TVF) for the "*Phulera Ka Panchayati Raj*" series, featuring three episodes, to sensitise the digital audience about the issues affecting GPs across India through stories that champion self-reliant GPs. In the three episodes, these films highlight own-source revenue through local taxes, challenge the 'Sarpanch Pati' (Pradhan Pati or Mukhiya Pati) culture, advocate for true women's leadership, and address the impact of the SVAMITVA Scheme and digital governance tools, such as the Meri Panchayat App, showcasing how rural communities are gaining access to transparent and efficient services.<sup>70</sup>

The initiatives embody core SBCC principles outlined in governance frameworks, including audience segmentation, pre-tested messaging via mass media channels, and participatory motivation to sustain behavioural shifts, such as revenue mobilisation and gender-inclusive decision-making.

Another initiative to enable the transfer of knowledge to the citizens is the Meri Panchayat App, developed by the MoPR. The app is a mobile governance tool that aggregates data from various GP portals, making it easily accessible to the public to promote transparency and accountability. It provides comprehensive details on demographics, elected representatives, Panchayat secretaries and officials, development plans, funds received, income and expenditure,

69 PIB release of MoPR dated 23 June 2025: <https://tinyurl.com/8w4w7hhc>

70 Press Release by MoPR dated 5 May 2025 <https://tinyurl.com/5n97hx4r>

resolutions (Sankalp), bank accounts, and statements. This holistic view empowers citizens to monitor Panchayat functioning, while elected representatives and functionaries can use dedicated login IDs to efficiently manage their tasks. Complementing this is the eGramSwaraj-BHASHINI integration, which allows eGramSwaraj to provide services in 22 scheduled languages of India through Bhashini's AI-powered translation, making local-language accessibility a reality for users across India. By overcoming linguistic barriers, this initiative promotes inclusive participation among Panchayat officials and citizens, improving service delivery and empowering Panchayats to address community needs more effectively, driving progress in rural governance.

To address water, sanitation and hygiene (WASH), health and nutrition related issues and bring behaviour change to adopt recommended practices among SHG members, DAY-NRLM has been implementing Food, Nutrition, Health and WASH (FNHW) interventions. Under FNHW, the states are developing state-specific operational strategies focusing on awareness generation and SBCC related to maternal and child health and nutrition, diet diversity, reducing anaemia, menstrual hygiene, diarrhoea, usage of toilets, hand washing and management of solid and liquid waste. FNHW component focuses on the creation of awareness on consumption of the produce from nutri-gardens, backyard poultry, small ruminants (goatery, piggery, etc.) and dairy-related interventions under the mission and other sources for improving nutritional intake. Around 6,406 blocks of 683 districts have initiated FNHW interventions.

Such initiatives stimulate community dialogue, enhance knowledge of panchayat activities, government schemes, and their impact, and ensure government interventions yield desired results and foster changes in attitude toward inclusive governance. Local administrators, including Sarpanches, acquire skills in e-governance, resource optimisation, and SDG localisation, as evidenced by the SBCC campaigns' emphasis on 'waste-to-wealth' and self-reliance themes, which mirror SBM-G innovations.

These interventions can be further leveraged to improve accountability. Information sharing about PAI progress with citizens can incentivise Panchayats to improve PAI scores. By promoting demand for services like those in RGSA (capacity building, e-governance), these efforts will elevate PRIs as vibrant SDG hubs. Overall, these initiatives illustrate how an innovative communication strategy can drive behavioural change, strengthen accountability, and promote inclusive, self-reliant Panchayats.

## **SOCIAL JUSTICE AS AN ENABLER OF INCLUSION**

13.78. Taken together, the progress in poverty reduction and rural development underscores how far India has moved in expanding opportunities and improving living standards for large sections of its population. Going beyond the target of poverty eradication, the goal of Viksit Bharat encompasses building an inclusive society where growth and development translate into fairness, dignity, and equal rights for all sections of society.

13.79. To build such a fair society, the government, through the Ministry of Social Justice and Empowerment, adopts a comprehensive approach to empower vulnerable populations across four key focus areas: social, economic, educational, and rehabilitative empowerment. Programmes include scholarship schemes, free coaching, a scheme for residential education in targeted areas, welfare programmes for senior citizens such as Atal Vayo Abhyuday Yojana (AVYAY) and Pradhan Mantri Anusuchit Jaati Abhyuday Yojana (PMAJAY), as well as rehabilitation measures and initiatives for the economic empowerment of targeted groups.

13.80. The venture capital fund for Scheduled Caste (SC) and Backward Classes startups has supported over 160 enterprises from these communities. The VISVAS Yojana (Vanchit Ikai Samooh Aur Vargon Ko Aarthik Sahayata) is an initiative for financial inclusion, offering credit support, interest subvention, and working in convergence with other programmes like MUDRA<sup>71</sup>, NRLM<sup>72</sup>, PRAYAAS<sup>73</sup>, etc., to improve the livelihood activities of marginalised groups. The progress made under various initiatives is detailed in Table XIII.3.

**Table XIII.3: Key schemes to improve social justice**

Scheme	Current FY26 (Up to December, 2025)
Pre-matric scholarship schemes for SCs & others - Centrally sponsored scheme	<ul style="list-style-type: none"> <li>17.14 lakh beneficiaries.</li> <li>₹359.47 crore of central share released</li> </ul>
Post-matric scholarship schemes for the SCs	<ul style="list-style-type: none"> <li>34.42 lakh beneficiaries</li> <li>₹4370.22 crore of the central share released</li> </ul>
SMILE - Rehabilitation for the welfare of transgender persons	<ul style="list-style-type: none"> <li>23 Garima Grehs, shelter homes in 17 states/UTs</li> <li>20 Transgender Protection Cells are set up</li> <li>27 Transgender Welfare Boards</li> <li>National Portal for Transgender Persons - to issue Transgender certificates and ID cards</li> <li>30,386 certificates issued</li> <li>Equal Opportunities Policy for Transgender Persons has been issued</li> <li>18 projects received assistance with ₹5.31 Crore released</li> </ul>

<sup>71</sup> Micro Units Development & Refinance Agency.

<sup>72</sup> National Rural Livelihoods Mission.

<sup>73</sup> Promoting Regular & Assisted Migration for Youth and Skilled Professionals.

SMILE - Comprehensive rehabilitation of persons engaged in the act of begging	<ul style="list-style-type: none"> <li>● Covers 181 cities</li> <li>● 26,781 individuals have been identified</li> <li>● 7,952 persons, including 1,317 children, rehabilitated</li> </ul>
Scheme for the implementation of the Protection of Civil Rights Act, 1955 and the Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Act, 1989 - Centrally sponsored scheme	<ul style="list-style-type: none"> <li>● Around 87,426 victims of atrocity are proposed to be provided relief</li> <li>● 26056 couples are proposed to be given an incentive for inter-caste marriage</li> </ul>
Scheme for residential education for students in high schools in targeted areas.	<ul style="list-style-type: none"> <li>● ₹103.47 crore utilised and 8898 beneficiaries provided support for school and hostel facility.</li> </ul>
National Action Plan for Drug Demand Reduction - Centrally sponsored scheme	<ul style="list-style-type: none"> <li>● 349 Integrated Rehabilitation Centres for addicts</li> <li>● 45 Community-based Peer-led Intervention programmes for children</li> <li>● 76 Outreach and Drop-in Centres - with provision of screening, assessment, and counselling</li> <li>● 154 Addiction treatment facilities</li> <li>● 139 District de-addiction centres</li> <li>● Toll-free Helpline for de-addiction: 14446</li> </ul>
Nasha Mukta Bharat Abhiyaan	<ul style="list-style-type: none"> <li>● 25.53 crore people sensitised since launch in August 2020.</li> <li>● 20,000+ Master Volunteers identified and trained</li> </ul>
Atal Vayo Abhyuday Yojana	<ul style="list-style-type: none"> <li>● ₹287.81 crore utilised under the four programmes - Integrated Programme for Senior Citizens, State Action Plan for Senior Citizens, Rashtriya Vayoshri Yojana, Elder line: National Helpline for Senior Citizens</li> </ul>
Pradhan Mantri Anusuchit Jaati Abhyuday Yojana	<ul style="list-style-type: none"> <li>● ₹144.63 crore utilised</li> <li>● 2611 Adarsh gram declared</li> <li>● 3 hostels sanctioned for 410 beneficiaries</li> </ul>
Scholarships for higher education for young achievers' scheme (SHREYAS) for SCs	<ul style="list-style-type: none"> <li>● ₹166.98 crore supported 3974 beneficiaries for higher studies in India</li> <li>● ₹29.93 crore supported 44 beneficiaries for higher education abroad</li> <li>● ₹43.98 crore supported 1495 beneficiaries for higher education in premier educational institutions in India</li> </ul>

13.81. Furthermore, the National Social Assistance Programme (NSAP) is implemented by the government as a social security programme designed for the vulnerable segment of our society. The objective of the programme is to provide a basic level of financial assistance to old age, widows, and disabled persons, as well as to bereaved households in the event of the death of the breadwinner belonging to the BPL. NSAP caters to 3.09 crore BPL beneficiaries. Further, states/UTs are also providing financial assistance to an additional 5.86 crore beneficiaries through State Pension Schemes. Therefore, around nine crore beneficiaries (central NSAP plus additional state beneficiaries) are covered under the pension safety net of the country at an estimated annual expenditure of more than ₹1 lakh crore.

13.82. Aadhaar-based Mobile Application for Digital Life Certification (DLC) of NSAP pension beneficiaries has been recently launched in July, 2025. A total of 47.76 lakh beneficiaries, as of 13 January 2026, have been authenticated through DLC across India. This digital innovation streamlines verification, reduces leakages, and enhances efficiency in delivering social assistance, aligning with Viksit Bharat's vision of inclusive, tech-enabled welfare for vulnerable groups.

13.83. For the inclusive development of minorities in the country, the government is ensuring universal access to education, skills, healthcare, and financial opportunities, while leveraging technology to enhance the ease of living, transparency, and good governance. The Ministry of Minority Affairs implements schemes for six notified minority communities<sup>74</sup>, including educational scholarships (Pre-Matric, Post-Matric, Merit-cum-Means), employment support via Pradhan Mantri Virasat ka Samvardhan and National Minorities Development and Finance Corporation (NMDFC) loans, special initiatives like Jiyo Parsi for population reversal and Waqf development, and for development of community infrastructure and basic amenities under Pradhan Mantri Jan Vikas Karyakram scheme.

13.84. The Ministry of Tribal Affairs implements several programmes for the socio-economic development of tribal communities and the protection of tribal rights. These include capacity-building initiatives such as the Adi Karmyogi Abhiyaan to strengthen decentralised tribal leadership and governance; the DA-JGUA to bridge infrastructure gaps, enhance access to health, education and Anganwadi services, and promote livelihoods; scholarship schemes; Eklavya Model Residential Schools to provide quality education to ST children in remote areas; the Pradhan Mantri Janjati Adiwasi Nyaya Maha Abhiyan for the development of 75 PVTG communities; and credit support through the National Scheduled Tribes Finance and Development Corporation.

---

<sup>74</sup> Sikh, Jain, Christian, Muslim, Parsi and Buddhist.

13.85. Building on these initiatives for the upliftment of vulnerable sections, minorities, and tribal communities, focused measures are also being undertaken for the welfare of sanitation workers. This is discussed in the following section.

### **Uplifting sanitation workers and waste pickers**

13.86. The Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013, was enacted to correct the historical injustice and indignity suffered by people employed to clean insanitary dry latrines and sewers. The Hon'ble Supreme Court has consistently issued directions to central and state governments to eradicate the practice, and has recently directed that it be banned in six major metropolitan cities. The Court has enhanced compensation for the deaths of sanitation workers to ₹30 lakh and highlighted the weak enforcement of the ban.<sup>75</sup>

13.87. With the realisation that the eradication of an injustice rooted in the iniquitous caste system requires more than just laws. Efforts for the sustained rehabilitation of manual scavengers have been reinvigorated with the launch of the National Action for Mechanised Sanitation Ecosystem (NAMASTE) scheme in July 2023. The Scheme aims to ensure the safety and dignity of sanitation workers. The focus is on preventing hazardous cleaning and promoting safe cleaning practices through trained and certified sanitation workers. The objective of the scheme is to formalise and rehabilitate the persons engaged in hazardous cleaning of sewer and septic tanks.

13.88. Under the scheme 89,104 sewer and septic tank workers (SSW) have been validated and profiled across the country for interventions. A comprehensive survey for identifying SSWs has been mandated by the Act for local governments; hence, a clear estimate for the country as a whole has yet to be compiled. The Swaach Sarvekshan survey in FY25 covered 4,589 urban local bodies (ULB). The use of this survey to estimate SSWs and waste pickers would ensure better coverage, uniformity in the criteria applied, and establish a country-wide baseline. This would help all future planning, enable better targeting and more efficient allocation of resources.

13.89. The continued use of workers in dehumanising and degrading sanitation roles, despite legal and administrative measures, indicates deeper systemic socio-cultural problems.<sup>76</sup> The majority of SSWs hail from a few castes, such as Valmiki, Mehtar, Dom, Madiga, Mala, etc., and they have historically faced stigma and discrimination. Addressing such deep-set caste-based stigma requires society-wide educational and behaviour change interventions to de-stigmatise and dismantle discriminatory

<sup>75</sup> Rekha v. State (NCT) of Delhi, 2024 SCC OnLine Del 3683, decided on 13 May 2024 <https://tinyurl.com/stw73drt>.

<sup>76</sup> Vidhi Centre for Legal Policy Blog: Still cleaning with bare hands. <https://tinyurl.com/mwar5ph8>

practices in re-employment. Civil society participation is vital for the eradication of manual scavenging and the sustained rehabilitation of SSWs. Given that the ULBs play a key role in identifying SSWs and implementing interventions, a performance-linked incentive and a penalty for non-compliance could be instituted to ensure better outcomes of the schemes targeting SSWs.

13.90. As a means to improve safety and increase mechanisation, 85,743 PPE (Personal Protective Equipment) kits and 653 Safety Device Kits for Emergency Response Sanitation Units have been provided to states/UTs. Additionally, capital subsidy has been released to 779 SSWs and their dependents for sanitation-related projects. Around 84,309 waste pickers have been validated with e-KYC in ULBs, and approximately 7,500 PPE kits have been distributed among them.

13.91. Mechanisation of sewer cleaning has been successfully employed by advanced countries, and they have transitioned to the application of higher-end technologies. Local governments in Japan utilise AI-enabled mapping, robotic cleaners, and suction systems to reduce human entry into their ageing sewerage systems. The EU has developed automated systems, such as PipeGuard and PIPEON, that integrate robotics, predictive maintenance, and real-time monitoring. In India, vehicle-integrated machines and robotic cleaners have been developed indigenously. Domestic production of these and other safety devices should be scaled up, and ULBs should be mandated to acquire them. Private investment in the production, operation, and maintenance of these machines, as well as job work contracts, should be incentivised by the ULBs.

13.92. Efforts to rehabilitate SSWs include providing housing, healthcare, skill development, and alternative employment opportunities. Over 70,000 SSWs have been covered under Ayushman Bharat – PM Jan Arogya Yojana, a state health insurance scheme that provides coverage for healthcare costs. The National Safai Karamcharis Finance and Development Corporation offers loan schemes that are implemented through channelising agencies and provides skill development/training through government sector training institutions. The corporation has supported over 6,600 beneficiaries with over ₹53.07 crore through various initiatives.<sup>77</sup> Together, these legal, technological, and welfare measures aim to enhance safety and improve livelihoods for sanitation workers, while addressing the deep-rooted socio-cultural barriers that have perpetuated this practice.

## OUTLOOK

13.93. The idea of equality, that not everyone may have the same outcomes, but they should have the same opportunities, is central to inclusive development. Providing

---

<sup>77</sup> National Safai Karamcharis Finance & Development Corporation: <https://nskfdc.nic.in/>.

equal opportunity entails tackling the layers of disadvantage experienced by various groups within a population. Increasing social mobility is not simply an argument for equality; it is also an economic argument: encouraging equality of opportunity is critical for economic efficiency since it maximises the utilisation of individual skills. This, in turn, demands ensuring access to opportunities and basic necessities.

13.94. The government's initiatives to lift the vulnerable out of the cycle of deprivation have yielded positive results, as reflected in various measures of poverty reduction. Government policies have had a significant influence on income distribution, primarily through subsidies, pensions, direct transfers, and public expenditures on social services, including education and healthcare. This is evident from the recent Household Consumption Expenditure Survey 2023-24, which reports a decline in consumption inequality and improved outcomes for the most vulnerable. The survey shows that the largest growth in average monthly per capita expenditure (MPCE) between 2022-23 and 2023-24 occurred among the bottom 5-10 per cent of the population in both rural and urban areas.

13.95. With gains in consumption for the most vulnerable, especially in rural areas, the path forward lies in amplifying this momentum through rural economic development. Reviving the rural economy through local opportunities and innovation is essential. There is a need to safeguard the environment, preserve culture and tradition, and promote inclusive growth across rural India. Local, decentralised economies should thrive, support livelihoods, and enhance living conditions. Growth does not need to be disruptive; rural communities can learn new skills, find livelihoods, maintain their health and financial stability, restore household harmony, and access modern education while preserving their cultural heritage, connections, and respect for the Earth.

13.96. While the progress in social indicators suggests the effectiveness of targeted policies, sustaining and further enhancing social development requires active engagement of communities and continuous feedback mechanisms. Frequent technology-enabled surveys should be established to enable targeted, data-driven interventions. Positive case studies must be documented and widely disseminated to encourage replication, while students, community elders, citizens, and prominent personalities should be engaged as role models to reinforce desired behaviours and strengthen community participation. Going forward, a framework of shared responsibility and respect must remain at the centre of India's growth journey. By making governance a two-way process, we can not only bridge the gap between policy and people but also nurture citizens who are proud, self-reliant, and prepared for the future.

\*\*\*

*This page has been left blank*

# EVOLUTION OF THE AI ECOSYSTEM IN INDIA: THE WAY FORWARD



*This chapter examines how Artificial Intelligence (AI) is reshaping the global economy and outlines a pragmatic strategy for India in an environment marked by rapid technological change and persistent uncertainty. The chapter argues that India's AI strategy should be grounded in its own economic realities, rather than attempting to replicate unsustainable models adopted in advanced economies.*

*Given the constraints related to capital, computing capacity, energy, and infrastructure, pursuing scale for its own sake is neither efficient nor necessary. Instead, the chapter makes the case that a bottom-up, multiple sector-specific approaches under a single vision has the potential to pay dividends and turn into a source of dignified employment for India's youth. India's development of AI must be grounded in open and interoperable systems to promote collaboration and shared innovation. This pathway aligns more closely with India's strengths in human capital, data diversity and institutional coordination.*

*On governance, the chapter emphasises sequencing, enabling experimentation first, scaling next, and introducing binding obligations only where risks and asymmetries are most pronounced. The proposed framework for data governance strikes a balance between openness to cross-border flows and strengthening accountability and regulatory visibility. It is rooted in the objective of ensuring that the value accruing from India's domestic data is retained within the country for the benefit of the people. The government's role is framed as that of an enabler and coordinator, helping markets and institutions adjust in step with technological change.*

*Overall, the chapter treats AI as a strategic choice. The central message is that India's opportunity lies in deploying AI in a way that is economically grounded and socially responsive.*

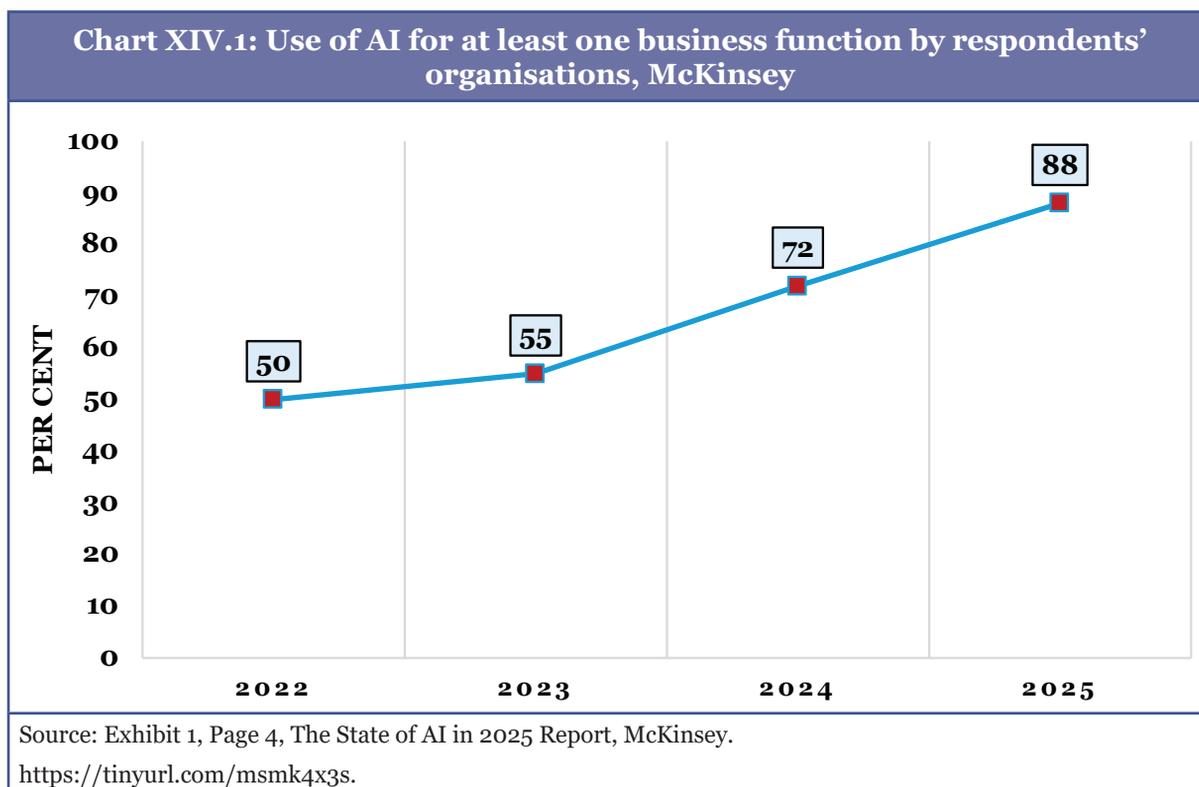
## ARTIFICIAL INTELLIGENCE IN INDIA'S ECONOMIC CONTEXT

### Introduction: What we know, and what we still don't

14.1. When the Economic Survey last examined Artificial Intelligence (AI) in early 2025,

the conversation, both globally and in India, was still dominated by the possibilities and potential of AI. While AI was already visible in some areas as a productivity-enhancing tool or embedded within some service platforms, its broader economic implications remained largely conjectural. The focus of the chapter, therefore, was appropriately placed on preparedness, discussing skills, data, infrastructure, and institutional readiness.

14.2. One year on, the conversation has definitely shifted. AI is no longer a distant or speculative technology. It is increasingly being adopted, even if in an experimental capacity, in organisations around the world. Based on a survey of 1993 firms by McKinsey, 88% of organisations surveyed in 2025 reported that they are utilising AI in at least one of their business functions.<sup>1</sup> Of those using it, 31% are in the process of scaling its application across the organisation, while 7% have already fully deployed and integrated AI.



14.3. Although utilisation is currently concentrated in High-Income countries (accounting for 58.4% of all usage in April 2025), utilisation in Upper- and Lower-Middle-Income countries has also expanded (22.5% and 18.7%, respectively).<sup>2</sup> Innovations and continuous improvement in AI capabilities are driving firms and new start-ups to develop ways in which AI can be applied to solve real-world problems.

<sup>1</sup> The State of AI in 2025 Report. McKinsey. <https://tinyurl.com/msmk4x3s>.

<sup>2</sup> Digital Progress and Trends Report: Strengthening AI Foundations. World Bank. <https://tinyurl.com/3k9hebmX>.

14.4. At the same time, greater visibility into AI adoption has also brought greater clarity on the nature of the technology itself. Over the past year, it has become evident that while the use of AI tools can be widespread, the frontier of AI remains highly concentrated. The development and training of advanced foundational models is increasingly capital-, compute-, data- and energy-intensive, favouring a small set of firms with access and the political capital to secure large-scale infrastructure projects, specialised hardware, and deep pools of technical talent.

14.5. Early evidence has also begun to temper some of the more extreme predictions surrounding AI's near-term labour impact. For instance, a study conducted by Yale's Budget Lab indicates that the broader labour market in the United States has not experienced a discernible disruption due to AI.<sup>3</sup> Similarly, a study by Brynjolfsson, Chandar, and Chen (2025)<sup>4</sup> highlights that the difference in job prospects between occupations highly exposed to AI and those with relatively low exposure is minor. According to Renault (2025), most Danish workers also benefit from the adoption of AI<sup>5</sup>. The emerging evidence does provide some reassurance in the near term, especially for labour-abundant economies such as India.

14.6. However, this does not invite complacency, especially from a policymaker's perspective. While labour may be complemented in the near term as organisations work to incorporate AI into their tasks, productivity gains from augmentation have a ceiling, as highlighted in Box XIII.2 of the Economic Survey 2024-25. Further, Box XIV.1 demonstrates a meaningful structural shift in the interaction between employment and output, using the United States as a case study. All in all, caution is still warranted as India attempts to solve the puzzle of AI and labour. This represents one of the most considerable looming uncertainties about the technology.

#### Box XIV.1: Employment in the AI-Salient Period - Evidence from the U.S. Service Sector

Public debate on the labour market implications of AI is highly polarised. One camp predicts large scale displacement while the other side notes that the effect of AI on labour markets will remain muted for the foreseeable future. These views are often framed in terms of labour substitution vs augmentation, yet empirical evidence capable of distinguishing between these outcomes remains scarce. The reason no definitive conclusions have been reached on anything AI-related is twofold. One, AI is relatively new and integrating it into existing

3 Gimbel, M., Kinder, M., Kendall, J., & Lee, M. (2025). Evaluating the Impact of AI on the Labor Market: Current State of Affairs. Technical report, The Budget Lab at Yale University. URL: <https://budgetlab.yale.edu/research/evaluating-impact-ai-labor-market-current-state-affairs>.

4 Brynjolfsson, E., Chandar, B., & Chen, R. (2025). Canaries in the coal mine? six facts about the recent employment effects of artificial intelligence. Digital Economy.

5 Renault, T. (2025). The Impact of Artificial Intelligence on Denmark's Labor Market. <https://doi.org/10.5089/9798229021647.018>.

economic structures is not straightforward. Two, considering that AI is still undergoing constant development, there is considerable uncertainty surrounding its capabilities and costs. Enterprises want to take risks and adopt AI, but also avoid being the ones who get it wrong.

However, the core uncertainty is not whether AI matters for this sector, but how and when it will manifest. Technological transitions do not arrive overnight as instantaneous shocks. Evidence from past automation waves suggests that early-stage adoption complements labour, with substitution pressures only emerging once the market saturates and productivity gains no longer lead to significant cost reductions.

Against this backdrop, our analysis examines employment dynamics in the United States' professional, business and information service sector, focusing on non-supervisory private-sector workers. The United States is used as a case study because its white-collar and services-heavy labour market sits closest to the technological frontier of AI adoption. Any dynamics observed can offer early-signals and policy-relevant insights for India as its own services-led economy moves along a similar, albeit lagged, trajectory.

Using a time-series framework, the analysis evaluates whether the period coinciding with the widespread introduction of Generative AI tools is associated with a change in the relationship between employment, output, wages, and financial conditions. Our analysis is explicitly framed as an assessment of structural change rather than a test of causal effects.

### **Estimation and Findings**

An Autoregressive Distributed Lag model was estimated with nonsupervisory employment in the Professional, Business, and Information Services (PBIS) sector as the dependent variable for the period from March 2016 to July 2025. Explanatory variables include the average hourly wages in the sector, the federal funds rate to account for the cost of borrowing, a monthly real GDP series created by S&P, and the consumer price index. To assess potential structural change in employment dynamics, the model incorporates a post-December 2022 regime binary dummy, corresponding with the period of heightened salience of GenAI tools, along with an interaction between this regime indicator and real output.

Our estimates indicate a change in the employment dynamics of the PBIS sector during the post-December 2022 period. Rather than indicating a discrete break in employment levels, the estimates point to a change in how employment responds to output growth in the post-2022 period.

Conditional on wages, output, and the interest rate, the post-December 2022 regime indicator is positively associated with PBIS employment, both in the short- and long-run. This association is interpreted as a structural shift in employment dynamics during the AI-salient period, rather than as evidence of direct causal effect of AI adoption. At the same time, the interaction between the post-2022 regime indicator and real GDP is negative and statistically significant across both time-horizons. This implies that relative to pre-2022, the marginal responsiveness of PBIS sector employment to output growth is lower in post-2022 regime.

### **Sectoral Contrast and Falsification Exercise**

To assess whether the post-2022 regime indicator captures a sector specific structural

shift rather than a broader macroeconomic phenomenon, an alternative specification was estimated using private sector non-supervisory employment that excludes the PBIS sector. The results reveal a stark difference.

In the non-PBIS sector, the post-2022 indicator is associated with a modest short-run coefficient and a near zero, statistically insignificant long-run coefficient. This stands in contrast to the PBIS estimates, where the corresponding short-run coefficient is substantially larger and the long-run association remains statistically significant.

The divergence suggests that the structural change identified in the PBIS sector is not a general feature of post-pandemic labour market dynamics, monetary conditions, or aggregate demand recovery. Instead, it appears to be concentrated in sectors characterised by higher sensitivity and exposure to GenAI tools.

To reiterate, this does not imply that GenAI has directly affected employment in PBIS while leaving others untouched. Rather, it demonstrates that the PBIS sector is exhibiting a markedly distinct adjustment pattern. The sectoral contrast strengthens the interpretation of the post-2022 dummy as capturing a meaningful structural shift rather than a purely cyclical or economy-wide effect.

## Discussion

The results suggest that employment adjustment in the PBIS sector is more nuanced than the polarised debate around AI-driven job losses would imply. Rather than indicating an abrupt contraction in employment, the estimates point to a change in how employment responds to output growth in the post-2022 period.

In this context, the positive association between the post-2022 indicator and PBIS employment is best interpreted as reflecting organisational and structural adjustments during a period of heightened technological salience. Firms may be expanding or reallocating labour to integrate new systems, manage workflows, and redesign service delivery, consistent with earlier findings that productivity-enhancing technologies can initially complement labour in sectors with elastic demand (Bessen, 2019<sup>6</sup>; Albanesi et al., 2024<sup>7</sup>). This may also be why a recent study published by Yale<sup>8</sup> found no net-negative effects of AI on labour demand in the United States.

Then why do many experts focus so much on automation and the potential for AI-induced displacements? Why are policymakers concerned about the adverse consequences of AI diffusion? This can be explained by the coefficient of the interaction term included in our model. The negative interaction between the post-2022 indicator and output suggests that marginal responsiveness of employment to economic growth has weakened relative to the pre-2022 period. Or put simply, the labour intensity of output has marginally declined. While this does not constitute evidence of task-level automation, it does indicate a shift in aggregate employment elasticities under a new technological regime.

6 Bessen, J. (2019). Automation and jobs: When technology boosts employment. *Economic Policy*, 34(100), 589-626, <https://tinyurl.com/2c7zmj3c>

7 Albanesi, S., Dias da Silva, A., Jimeno, J. F., Lamo, A., & Wabitsch, A. (2024). New technologies and jobs in Europe. *Economic Policy*, eiae058, <https://tinyurl.com/ymarmumr>

8 <https://budgetlab.yale.edu/research/evaluating-impact-ai-labor-market-current-state-affairs>

Taken together, the estimates imply that policymakers and firms might witness a non-linear labour market trajectory. Unless the labour market adapts and new skills are learned, which alter the profile and types of jobs people are engaged in, we may observe even more reductions in the labour-intensity of GDP in the future. Paraphrasing the words of T.S. Elliot, the change comes not in a single shock, but in a quiet, steady drift.

**Table XIV.1: Short-run dynamics<sup>9</sup>**

Variable	PBIS Sector (Std. Error)	Non-PBIS Sector (Std. Error)
D(Regime Indicator)	25.74 (3.74)	1.58 (0.11)
D(Interaction)	-2.572 (0.37)	-0.00007 (-0.00179)
Error Correction Term	-0.217 (0.04)	-0.07 (0.009)

Source: Author's Calculations

**Table XIV.2: Long-Run Dynamics**

Variable	PBIS Coeff (Std. Error)	Non-PBIS Coeff.
AI	9.409 (1.556)	1.90 (1.92)
Interaction	-0.938 (0.154)	-0.00795 (-0.00819)

Source: Author's Calculations

Bounds Test F-Statistic is significant at 5%

14.7. Uncertainty also extends into the evolving structures of the global AI ecosystem. Control over critical inputs, such as data, compute, models, and standards, is increasingly concentrated. This raises concerns about market power, technological dependence, and the resilience of supply chains. It also raises a substantial question about the future of India's IT sector, as firms that once relied on India's comparative advantage to handle a bulk of their work may no longer need to do so. It risks hollowing out India's core value proposition if adaptation lags. If the country is to sustain its competitive edge in IT, a comprehensive evolution is necessary, one that takes full advantage of the potential embedded in AI development and deployment.

<sup>9</sup> Coefficients of other macro variables are not included here for brevity.

14.8. Another source of uncertainty pertains to defining a regulatory approach to AI. Countries diverge in how they design their institutions to address AI-related challenges, reflecting differing priorities. For advanced economies, their decisions will determine how AI can be leveraged to enhance productivity in the face of labour shortages and an ageing population. For India, the challenge is to govern AI in a manner that is sensitive to its economic realities. The choices that India's own institutions make will play a central role in determining not only the pace of AI diffusion but also how its economic value is distributed across sectors and among people.

14.9. The question, therefore, is how India positions itself within an ecosystem marked by rapid technological change, concentrated capabilities, limited resources and persistent uncertainty. Will it remain primarily a consumer of AI technologies or emerge as a meaningful contributor to their development and deployment? This is what the chapter aims to contribute towards.

14.10. In the sections that follow, we outline the trade-offs that India will have to contend with and how the nation can evolve its AI ecosystem in a manner that best aligns with its goals. The following sub-section details the trade-offs and asymmetries involved in building an AI ecosystem. Sections 2 to 4 highlight the strategic necessity of India's own AI solution and propose practical steps that can be taken to evolve the ecosystem, including AI model and application development, human capital, and how governance needs to evolve, including a framework for incentivising data localisation. Section 5 highlights the various safety concerns that policymakers must be aware of. Section 6 puts forth a phased deployment proposal, and concludes.

### **Asymmetries and Trade-offs in the AI Ecosystem**

14.11. The AI ecosystem is characterised by pronounced asymmetries across countries, firms, capabilities, and stages of the value chain. These asymmetries are not incidental; they are structural outcomes of how AI is financed, developed and deployed. For India, recognising these asymmetries is essential, as policy choices in AI are constrained by the trade-offs these asymmetries present to the country.

#### **Frontier versus Application: Capability Asymmetries**

14.12. At the core of the global AI divide lies a sharp distinction between frontier model development and application-led development. While AI usage has been growing, as highlighted by the World Bank report cited earlier, the capability to design and train large foundational models remains highly concentrated in the hands of a few large firms. These firms exercise significant control over the market and exert high demand pressures on the resources necessary for AI, allowing them to erect high barriers to entry.

14.13. Add to this the export restrictions imposed on the most advanced processors required for scaling up frontier model development, and the task ahead of India becomes extremely challenging. This creates a fundamental asymmetry: most countries may end up participating in AI primarily as users, while a few will shape the technology's trajectory, standards, cultural leanings, and pricing. Attempting to close this gap would involve prohibitive fiscal costs towards what is increasingly becoming an unsustainable approach to AI development. The trade-off, therefore, is between expending scarce resources to chase frontier-scale models or deploying those resources more effectively towards domain-specific AI systems aligned with domestic economic priorities.

### **Scale versus Inclusion: Capital-Labour Trade-offs**

14.14. AI adoption alters incentives within firms by raising the marginal productivity of capital relative to labour, particularly in white-collar service sectors. Firms driven by cost reductions and maximising productivity gains are more inclined to rapidly scale up AI adoption<sup>10</sup>, increasing the likelihood of capital-labour substitution in specific task categories. Most of these tasks are concentrated in the low-value-added segments of the service sector, and high exposure to AI<sup>11</sup> means firm leadership may view these jobs as redundant.

14.15. For labour-abundant economies such as India, this creates a tension between aggregate productivity gains and employment absorption. Rapid, uncalibrated deployment of AI may boost output but risks displacing segments of the workforce faster than the economy can reabsorb them. Conversely, delaying adoption to protect jobs may risk locking firms into a low productivity equilibrium. The policy challenge, therefore, is not whether to adopt AI, but how to pace its diffusion so that labour augmentation can be facilitated.

### **Open versus Proprietary Models: Cost, Control, Dependence**

14.16. Another asymmetry lies in the ownership and governance of AI models. The most widely deployed AI models are proprietary and opaque, limiting transparency around their training data, internal logic, and update mechanisms. Since these models are essentially black boxes, users can never know what changes are being made to the underlying source code and how it might be altering the behaviour of the AI model.

14.17. In contrast, open-source models and open-weight models offer lower entry barriers, greater adaptability, and reduced vendor lock-in. However, they also include trade-offs

<sup>10</sup> From Financial Times. Accessed 23rd December 2025. <https://tinyurl.com/mr42snkj>.

<sup>11</sup> Tomlinson, K., Jaffe, S., Wang, W., Counts, S., & Suri, S. (2025). Working with AI: measuring the applicability of generative AI to occupations. arXiv preprint arXiv:2507.07935.

related to quality control and fragmentation if not guided by a coherent national strategy. India's challenge is to strike a balance between openness and stewardship, leveraging shared innovation while ensuring that the economic value created from domestic data and intellectual property accrues within India rather than being captured abroad.

### Compute Intensity versus Resource Constraints

14.18. AI development is inextricably linked to physical infrastructure. Data centres require large quantities of electricity<sup>12</sup> and water<sup>13</sup>, and AI workloads introduce volatility into power demand, posing risks to grid stability<sup>14</sup>. Global experiences show that AI-driven data centre expansion can place significant strains on existing energy systems, even in advanced economies.

14.19. In a recent Congressional testimony, Mark P. Mills, senior fellow at the Manhattan Institute noted, *“The unprecedented digital construction underway has led to the rediscovery of a basic truth: All software exists inside hardware that, in turn, uses energy, a lot of it. Each digital byte uses an infinitesimal amount of energy. But here we find salience for the euphemism that quantity has a quality all its own. Again, in moonshot terms: the amount of energy used to launch a rocket is consumed every day by just one AI-infused datacenter.”*<sup>15</sup>

14.20. Similarly, the CEO of IBM raised concerns about the financial viability of the capital expenditures being undertaken for data centre expansion<sup>16</sup>. With some firms projected to burn half a trillion in cash by 2030 while pursuing compute infrastructure

<sup>12</sup> To grasp the scale of electricity demand from AI data centres, one need only look at the recent revision by the U.S. Energy Information Administration (EIA). Previously, the EIA had projected a modest 2 % annual growth in electricity consumption through 2026. In light of the rapid expansion of AI-driven data centre activity, the forecast has been sharply revised upwards, to 3 % growth in 2025 and 5 % in 2026. See Short-Term Energy Outlook, June 2025. US Energy Information Administration.

<sup>13</sup> AI Data Centers consume upto 20 lakh litres of water per day, and globally, they consume 56,000 crore litres of water annually (as recently reported by Bloomberg, <https://tinyurl.com/wsdmmbjr>). If India scales up AI Data Centers, it has the potential to add an extraordinary amount of stress on our already strained groundwater and freshwater reserves. Also see analysis from the University of Illinois (<https://tinyurl.com/yc5fax8j>), Stanford University (<https://tinyurl.com/bbce9en5>), and the New York Times (<https://tinyurl.com/mr283x7f>).

<sup>14</sup> For instance, an incident on 10th July 2024 in Northern Virginia demonstrated how the simultaneous loss of 1500 MW of load from the data centres caused significant voltage depression and frequency deviation in the power grid. Swift intervention by the grid operators prevented a massive surge in the electrical systems, only narrowly avoiding a total blackout in the region. The incident demonstrates how the proliferation of AI Data centres across India can add significant strain to the grid. The integration and power usage of AI Data Centres is a topic that requires separate and serious consideration. See North American Electric Reliability Corporation Incident Review. Published on 8th January 2025. <https://tinyurl.com/2nrdfa48>.

<sup>15</sup> Testimony of Mark P. Mills, Executive Director of the National Center for Energy Analytics Before Subcommittee on Economic Growth, Energy Policy, and Regulatory Affairs U.S. House Committee on Oversight and Government Reform. <https://tinyurl.com/y5zjymaa>.

<sup>16</sup> IBM CEO questions profitability of AI Data Centre Boom. <https://tinyurl.com/bdfuwfdc>.

creation for AI<sup>17</sup>, the risks of a financial contagion<sup>18</sup> stemming from the unprecedented scale of a debt fuelled expansion<sup>19</sup> remains high.

14.21. For India, as power, finance, and especially water remain binding constraints, scaling compute indiscriminately carries opportunity costs. Investment in AI infrastructure competes directly with other sources of demand, such as households and industries. This creates a trade-off between centralised scale and distributed efficiency, strengthening the case for smaller, task-specific models that can run on limited hardware and decentralised compute networks.

### **Regulation versus Innovation**

14.22. An age-old trade-off that policymakers must always contend with is the balance between sustaining innovation and designing regulatory frameworks intended to keep the broader public safe. Furthermore, the trade-off between the two is inherently asymmetric across countries. Regulatory compliance, aimed at ensuring safety, controlled proliferation, auditing, transparency, or mitigating liability exposure, imposes fixed costs that may scale poorly for smaller firms and those involved in early-stage experimentation.

14.23. Frontier AI ecosystems in high-income countries and other cash-rich large firms often demonstrate a capacity to absorb these costs. India's more fragmented and resource-constrained innovation landscape could be stifled if the same degree of regulations were binding.

14.24. However, very minimal or completely absent regulatory clarity can undermine trust, slow adoption, and create systemic risks, particularly as AI is deployed in critical sectors such as healthcare, education, governance, or finance. The challenge for India, therefore, is how and when to regulate AI.

### **Strategic Autonomy versus Global Integration**

14.25. Lastly, AI has emerged as a geostrategic asset. Export controls on advanced chips, restrictions on technology transfer, and the weaponisation of software and inputs necessary to build AI infrastructure have underscored the risks of overdependence on foreign systems. As AI applications diffuse into critical sectors and public institutions, these dependencies carry systemic risks.

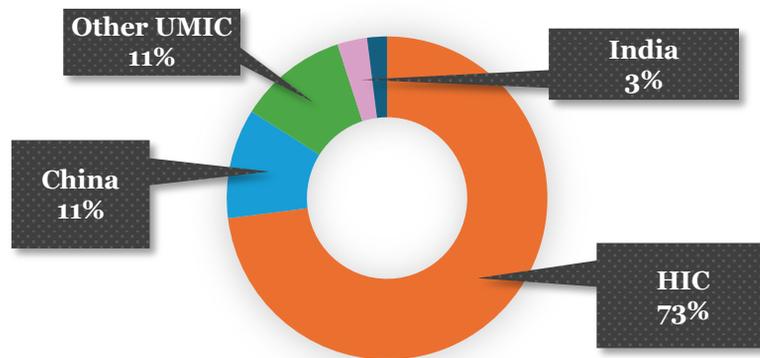
---

17 OpenAI needs to raise at least USD 270 bn by 2030 so it can continue to lose money. Financial Times. Accessed on 27 December 2025. <https://tinyurl.com/mpkk86p5>.

18 IMF World Economic Outlook, October 2025. <https://tinyurl.com/ywkrzt73>.

19 Tech groups shift USD 120 bn of AI data centre debt off balance sheets. Financial Times. Accessed on 27 December 2025. <https://tinyurl.com/3ywmvraf>.

**Chart XIV.2: Over 70% of all data centres (by count) are located in High-Income Countries (as of June 2025)**



Source: Digital Progress and Trends Report: Strengthening AI Foundations. World Bank. <https://tinyurl.com/yhr9hav7>.

14.26. Yet, complete technological self-sufficiency is neither feasible nor efficient. The trade-off, therefore, lies between strategic autonomy and continued integration with global innovation networks. India’s policy choices must navigate this balance carefully, preserving openness where it enhances capability while insulating critical functions from external shocks.

14.27. These asymmetries do not imply that India is at a structural disadvantage in the AI era. Instead, they define the constraints within which a viable and sustainable AI strategy must be formulated. The sections that follow build on this diagnosis to outline pathways that seek to maximise economic and social returns from AI while remaining mindful of the trade-offs.

## A DEVELOPMENT-ORIENTED APPROACH TO AI

### The necessity of India’s own AI solution

14.28. The AI ecosystem remains sufficiently young that existing imbalances and constraints need not define its future trajectory. This creates an opening for India to shape a more value-creating and dignified employment opportunity for its workforce. As NITI Aayog’s report highlights, there are numerous potential benefits to indigenous AI development<sup>20</sup>. Multinational IT companies have thus far benefited from “low-cost labour” in India, but AI presents an opportunity to shift perceptions and structurally change the reality of India’s labour market.

14.29. Secondly, developments in AI will have natural spillovers into existing sectors such as services, manufacturing, defence and power. In this context, reliance on foreign

<sup>20</sup> AI for Viksit Bharat: The Opportunity for Accelerated Economic Growth. NITI Aayog.

multinationals for AI-based solutions will leave India vulnerable to shifts in geopolitics, potentially constraining the country's future diplomatic choices. Just as critical minerals and semiconductors are utilised to shape foreign policy, AI capability and resources will similarly be utilised for geostrategic negotiations.<sup>21</sup>

14.30. Accordingly, AI should not be regarded merely as a technological advancement, but as a strategic priority with far-reaching implications for the future of India's critical infrastructure, labour market, foreign policy and culture.

#### **Box XIV.2: Identifying Bottlenecks to AI Compute Expansion - An Agent Based Model Approach**

As discussed earlier in the chapter, the availability of sufficient compute capacity in India is a necessary condition for the training and development of cutting-edge models. However, surging demand for inputs (driven by higher GPU demand) and constrained supply conditions (due to shortages in the availability of high-bandwidth memory chips and storage) are driving cost concerns<sup>22</sup>. This, in turn, is bound to have a ripple effect on the cost of expanding compute capacity in India making financial viability a possible bottleneck.

Similarly, higher demand from buyers abroad can choke the available supply of GPUs<sup>23</sup>. Thus, even if the sovereign, domestic investors, or financial institutions are willing to finance data centre expansion, plans may need to be put on hold until GPU supplies are secured. In this context, the objective of this exercise is to examine how the expansion of data centre and AI compute capacity is shaped by the interaction of financial constraints, infrastructure readiness, and external supply dependencies.

To do so, the exercise adopts an Agent Based Modelling (ABM) approach where financing, grid availability and hardware access are allowed to interact and shape one another through feedback loops. The focus is on identifying conditions under which coordination failures emerge, even in the presence of strong underlying demand.

The exercise is intended as a policy stress test rather than a forecasting tool. It does not aim to estimate optimal capacity levels or precise investment requirements. Instead, it is designed to surface structural vulnerabilities in the AI infrastructure ecosystem, identify leverage points where policy interventions may be most effective, and clarify the limits of price-based or subsidy-led approaches when financial and infrastructural constraints are binding, as is the case for India.

21 Dr. Chris Miller's book titled "Chip Wars" offers a sobering reality check about our dependence on a handful of nations for semiconductors which are extremely critical to every facet of the modern economy. The control over certain processes within the supply chains affords nations a very powerful bargaining tool for shaping global geopolitics in their own favour. AI is expected to be used in a similar way.

22 NVIDIA in its Q3 2026 Earnings Call expressed concern over the rising cost of inputs. <https://tinyurl.com/mtjc88tz>.

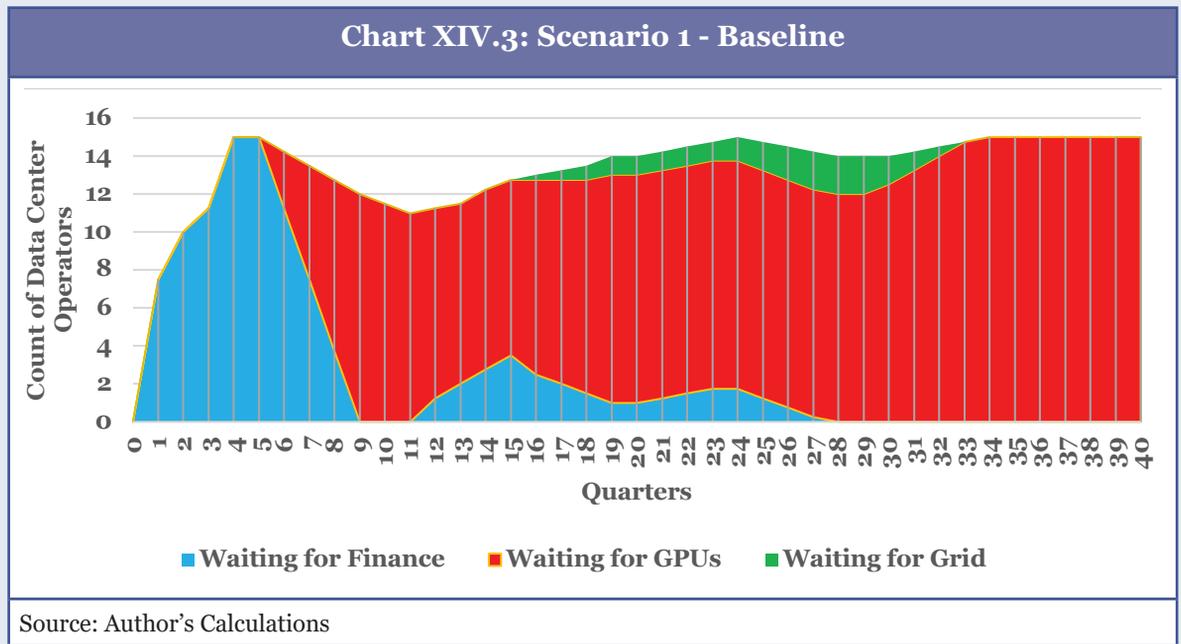
23 OpenAI recently signed a deal with two of the only three major high-bandwidth memory manufacturers in the world to purchase 40% of the global supply of memory chips. <https://tinyurl.com/368u9kkd>.

The simulation was run for a period of 40-quarters, capturing the evolution of constraints over the medium-term.

**Scenario 1: Baseline**

For the baseline scenario, demand for data centre capacity is assumed to grow at a rate of 24% per annum, which is on the conservative side of expectations<sup>24</sup>. Power tariffs start at ₹8 per kWh, and are elastic within the system. Additional power capacity is added to the grid with a lag of 12 quarters and the cost of borrowing for data centre operators at baseline is set at 9% per annum. Based on the above configuration, the system is setup and simulated. Letting the model run for 40 quarters, in discrete time, reveals the outcomes of our baseline scenario.

At base, the model exhibits a sequencing of bottlenecks over time, rather than a simultaneous binding of constraints. In the early quarters, the dominant friction is access to finance, as operators attempt to scale capacity ahead of realised revenues. Despite strong and steadily growing domestic demand, balance-sheet constraints and investor hurdle rates initially prevent a subset of firms from expanding, leading to a short-lived spike in entities waiting for finance. As revenues accumulate from the rising cost of compute and margins stabilise, this financial bottleneck eases, indicating that under normal macro-financial conditions, financing constraints are not permanently binding but act as an initial filter on expansion timing.



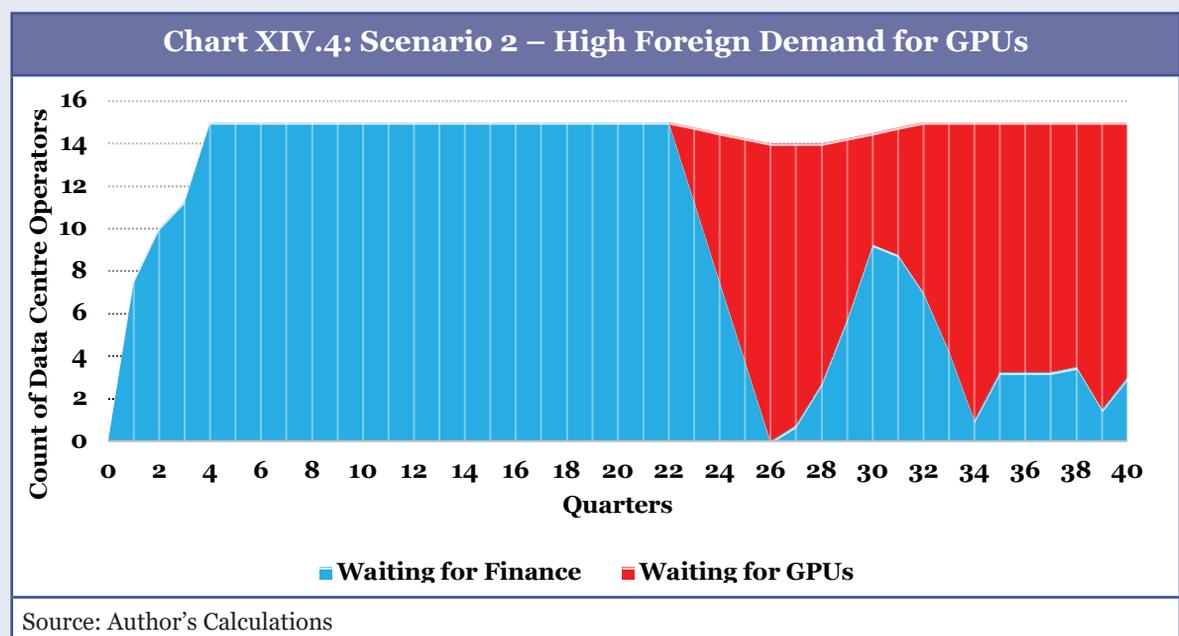
As the simulation progresses, the primary constraint shifts toward GPU availability. Even with “normal” global supply conditions and India’s GPU share in global demand set at a realistic 4%, the probabilistic access mechanism and minimum lead times result in a persistent and growing pool of operators waiting for hardware. This bottleneck dominates for most of the simulation horizon, suggesting that hardware access, rather than pricing or power availability, becomes the central limiting factor in sustained capacity expansion.

<sup>24</sup> See, for instance, projections by S&P. <https://tinyurl.com/2fwhrkmu>.

Grid-related constraints emerge only episodically but remain secondary. Overall, the baseline outcome illustrates a system where demand is not the binding constraint; instead, expansion is paced by the slowest-moving complementary inputs, with hardware supply uncertainty exerting the longest lasting drag on scale-up.

**Scenario 2: Elevated Foreign GPU Demand (Relative to Baseline)**

In the second scenario, foreign demand is set to expand at almost double the pace of the baseline scenario, with all other factors remaining the same. Running the simulation for 40 quarters once again sheds light on some interesting dynamics. Higher foreign demand directly impacts the price of GPUs, worsening project economics by increasing upfront capex required and challenging the financial viability of data centre projects in India. Higher prices also weigh down on the profitability margins and the debt service capacity of data centres, making investors and banks reluctant to finance further expansion. The financial bottleneck remains a binding constraint for significantly longer than in the baseline.

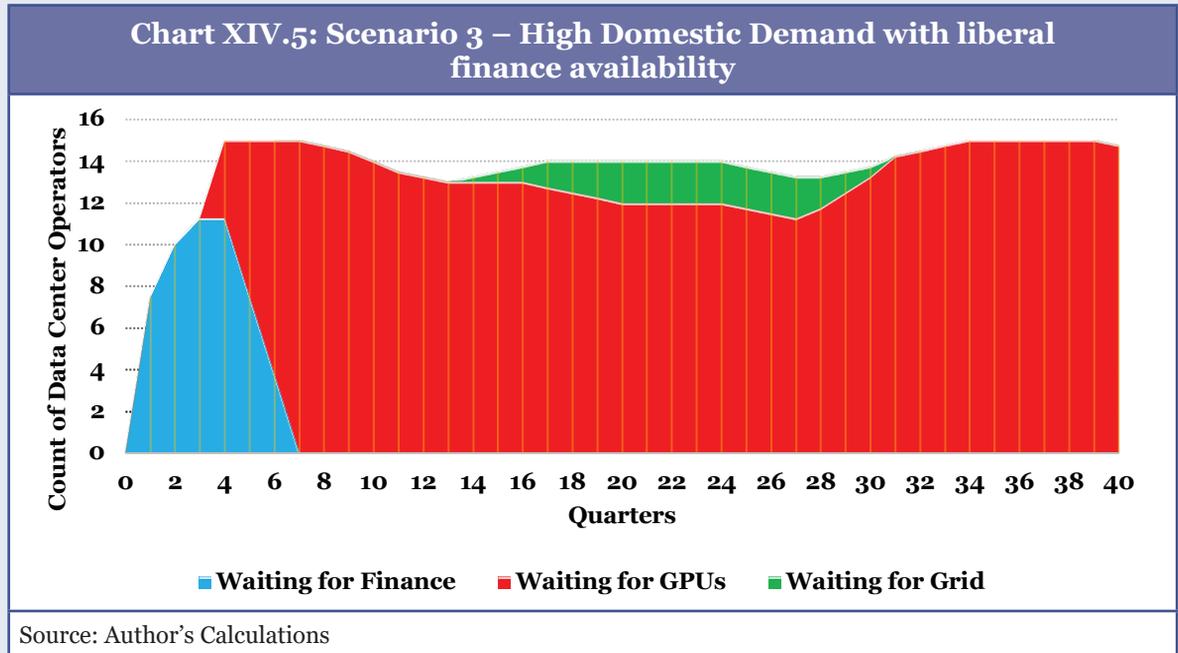


Over time, even as a subset of operators gradually overcome initial financing constraints due to the rising cost of compute contributing to increased revenues, uncertainty around global GPU supply continues to bind. While balance sheets improve and access to finance partially normalises, elevated global demand keeps GPU availability probabilistic and delivery timelines uncertain. This creates a second-order constraint: projects that are financially viable on paper are still unable to proceed due to unresolved hardware access. The result is a decoupling between financial readiness and execution capability, underscoring that easing domestic financial constraints alone is insufficient when hardware supply remains externally constrained.

**Scenario 3: High Domestic Demand with liberal financing (Relative to Baseline)**

In scenario 3, foreign demand is returned to baseline but India's demand is now set to grow at 32% per annum. India's share in global GPU demand is increased to 6% a year. To ensure there is sufficient finances available to fund the growing appetite, investor hurdle rates are

lowered to 10% (relative to 15% for the baseline scenario), and the financial system is flush with liquidity. This reduces the incidence and duration of financing bottlenecks in scenario 3, with a lesser number of operators waiting for a decreased period of time (2 less quarters relative to baseline) to avail funding.



However, the relaxation of financial constraints does not translate into proportionate capacity addition. Instead, the dominant bottleneck shifts decisively to GPU availability, with grid constraints appearing intermittently as utilisation rises. Higher domestic demand accelerates the pace at which projects reach the execution stage, but hardware access remains governed by global supply conditions. As a result, a large share of operators accumulate in the “waiting for GPUs” state for much of the simulation horizon. Compared to the baseline, the system moves faster into this hardware-constrained regime, while compared to Scenario 2, the constraint emerges despite favourable global conditions, underscoring that abundant capital and strong demand are insufficient to overcome physical and geopolitical limits in advanced hardware supply chains.

**Concluding Thoughts**

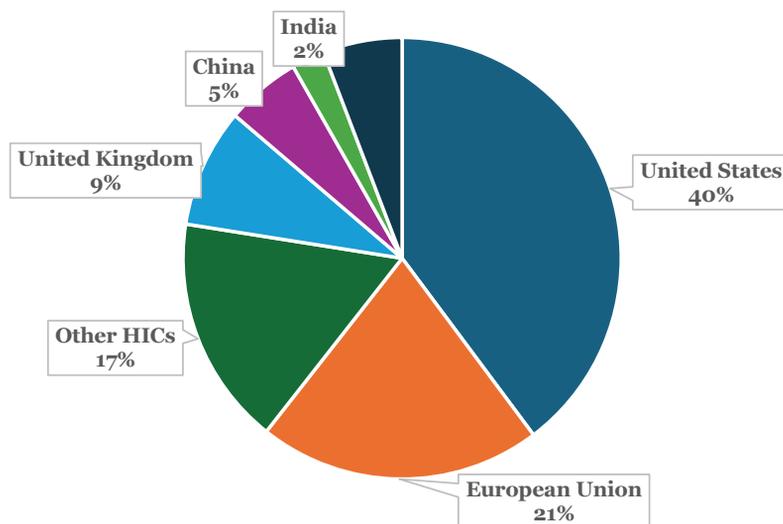
Across all scenarios, a recurring pattern is that developments in global GPU supply chains play a meaningful role in shaping the long-run pace of AI infrastructure expansion. This persists even when domestic demand conditions are strong and financial constraints are eased, highlighting an important consideration for India’s AI strategy: capacity expansion may be influenced by the structure and concentration of global hardware supply chains. As a result, conventional policy levers to expand access to finance and incentivise domestic development of AI may need to be complemented by measures that enhance supply-side resilience in access to advanced compute. In this context, India’s AI strategy will, in the medium term, need to rely on diversified and resilience access to global compute. Over time, the objectives of the National Semiconductor Mission highlighted in Chapter 8, are expected to evolve toward building domestic capabilities that can progressively meet a larger share of India’s advance compute demand.

## Bottom-up approach to AI development in India

14.31. The global AI ecosystem has diverged along two distinct development paths. Sector leaders in the West have pursued a top-down strategy centred on frontier models, massive private capital, significant expenditures on computing infrastructure, and the concentration of intellectual property within a small number of hyperscale firms. Elsewhere, by contrast, a bottom-up approach, characterised by distributed innovation across firms and sectors, strong state coordination, and an emphasis on application-specific AI rather than frontier model supremacy, is the norm. India's position in this landscape, reflecting a distinct set of constraints and capabilities, make a bottom-up approach strategically necessary.

14.32. India enters the AI era with notable strengths. It ranks among the top global contributors to AI research output<sup>25</sup> and possesses a deep pool of technical talent in the field of artificial intelligence.<sup>26</sup> The country also has a highly AI-literate labour force, outranked only by the United States as of 2024.<sup>27</sup> India also holds a considerable potential comparative advantage in terms of its own domestic data sources. The heterogeneity and scale of our country suggest the possibility of curating diverse domestic datasets across various sectors, including health, agriculture, finance, education, and public administration. This asset remains underutilised.

**Chart XIV.6: Startups focused on curating training data are yet to come up at scale in India**



Source: Digital Progress and Trends Report: Strengthening AI Foundations. World Bank. <https://tinyurl.com/yhr9hav7>.

<sup>25</sup> Country Activity Tracker by Emerging Technology Observatory, Georgetown University.

<sup>26</sup> The Global AI Talent Tracker 2.0, Paulson Institute

<sup>27</sup> Artificial Intelligence Index Report 2025. Stanford University. [https://hai.stanford.edu/assets/files/hai\\_ai\\_index\\_report\\_2025.pdf](https://hai.stanford.edu/assets/files/hai_ai_index_report_2025.pdf)

14.33. At the same time, India's access to cutting-edge compute infrastructure is limited, financial resources for large-scale model training are scarce, and private participation in foundational AI research remains relatively muted compared to global leaders. These constraints render the pursuit of foundational models as the centrepiece of an AI strategy challenging<sup>28</sup>. A bottom-up approach to AI development aligns more closely with these realities.

14.34. This strategy also recognises that value creation in AI need not be concentrated in a small number of frontier models or firms. Early adopters who scaled under conditions of abundant capital and weak regulatory frameworks are now locked into a system characterised by high energy intensity, opaque development practices, ballooning financial commitments, and uncertain revenue models. Being a late mover gives India the benefit of hindsight, allowing policy and innovation choices to be shaped with greater intentionality. India must avoid costly path dependencies and unsustainable design choices that have been observed elsewhere.

14.35. In this context, the proposed approach prioritises application-specific, small models that are tailored to defined uses and sectoral needs<sup>29</sup>. Such models are significantly more computationally efficient, easier to fine-tune, and capable of running on locally available hardware, such as smartphones or personal computers, making them better suited to India's existing infrastructure base. Crucially, they allow innovation to emerge from a broader set of actors, including start-ups, research institutions, public agencies, and domain-specific firms. This allows broader development and diffusion of AI solutions, free from concerns about resource constraints or high entry barriers.

14.36. The scenario analysis presented in Box XIV.2 further reinforces the strategic relevance of this approach. With the simulations indicating that centralised AI compute expansion is exposed to hardware supply uncertainties, application-specific small models running on local hardware offer a more sustainable path forward. By enabling computation to occur locally, these models also facilitate secure deployment in sensitive sectors, such as public administration, healthcare, defence, and critical infrastructure. The decentralised compute paradigm enables AI capabilities to spread widely across sectors without requiring proportionate expansion in expensive, resource-intensive, and hardware-intensive data centres.

---

<sup>28</sup> Although it is worth noting that frontier efforts currently underway will definitely result in the acquisition of valuable process knowledge that will ultimately trickle down into the bottom-up strategy.

<sup>29</sup> Belcak, Peter, Greg Heinrich, Shizhe Diao, Yonggan Fu, Xin Dong, Saurav Muralidharan, Yingyan Celine Lin, and Pavlo Molchanov. "Small Language Models are the Future of Agent AI." arXiv preprint arXiv:2506.02153 (2025).

### Box XIV.3: Local Ingenuity and Frugal AI in India

India's AI story is already evolving from the bottom-up. Local innovators, municipal bodies, start-ups, and community institutions are deploying AI to solve problems that are immediate and contextual to the communities they reside in. Applications are spread across a wide variety of sectors including health, agriculture, education, urban management, and disaster preparedness<sup>30</sup>.

In healthcare, AI is being used to expand access where traditional systems struggle to reach. In southern India, non-invasive AI-enabled thermal imaging tools are enabling early breast cancer screening in low-resource settings, reducing dependence on expensive diagnostic infrastructure and specialist availability. In eastern India, portable and low-cost AI-assisted oral cancer screening devices are bringing early detection to primary healthcare centres and outreach camps, directly addressing delays that often worsen outcomes.

Urban and environmental challenges have similarly seen locally grounded solutions. In high-stress cities such as Bengaluru, AI-based water management systems are monitoring consumption and detecting leakages in real time. In the Himalayan region, indigenous sensor networks combined with machine learning models are providing real-time landslide alerts across vulnerable slopes. By offering advanced warnings at critical points, these systems are strengthening disaster preparedness in ecologically fragile areas.

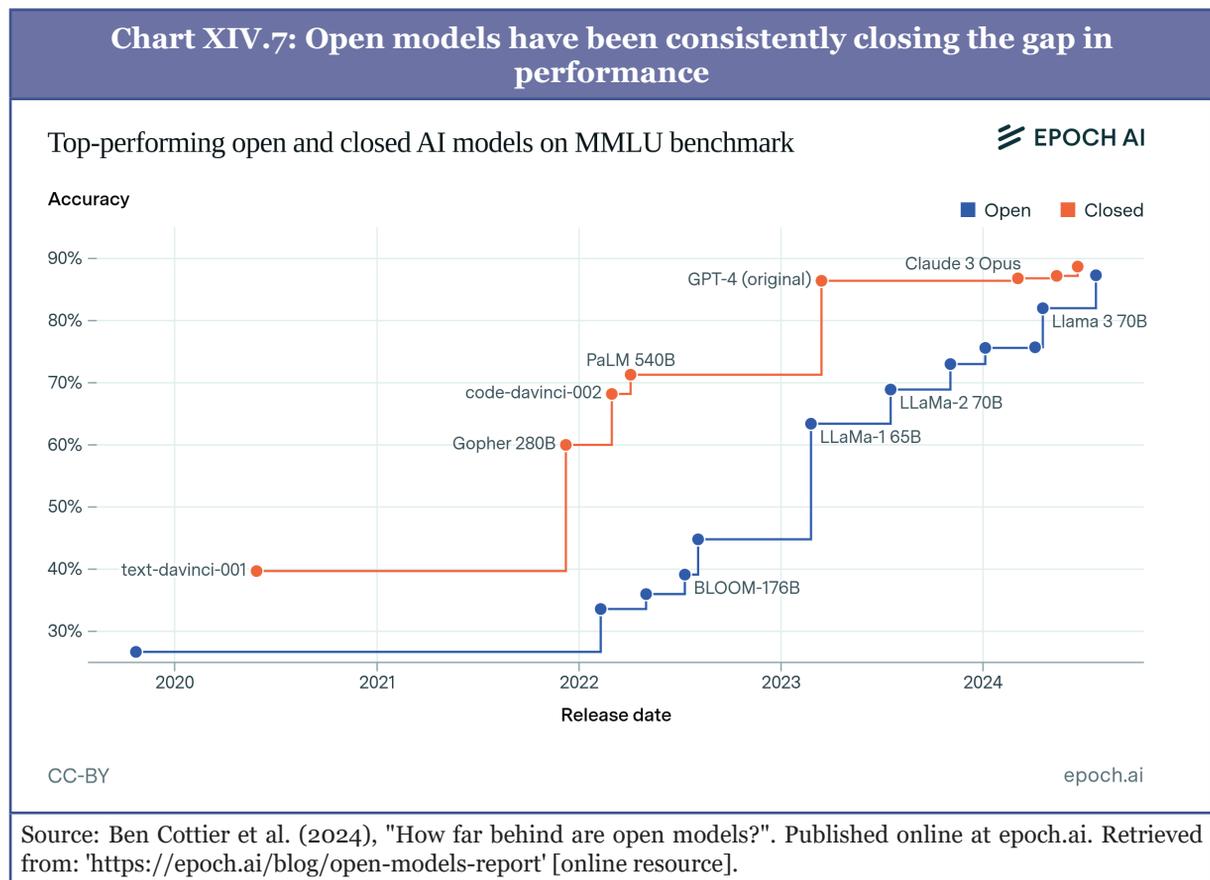
Deployment in agriculture and education further highlight the breadth of bottom-up adoption. AI-enabled agricultural networks have already improved market access, price discovery, and logistical efficiency for 1.8 million farmers across 12 states. At the municipal level, AI analytics are being utilised to monitor classroom learning outcomes, identify gaps early, and support more targeted interventions. Covering 18 classrooms across three schools in Pimpri-Chinchwad, the pilot has already produced material gains in terms of higher student engagement, improvement in teacher focus due to higher accountability, and enhanced supervisory capacity by school heads.

Beyond sectoral applications, India's approach to AI adoption also includes initiatives such as Bhashini, led by the Ministry of Electronics and Information Technology, and AI4Bharat at IIT Madras. These illustrate how language and voice-first AI systems can extend the reach of digital services to populations historically excluded from text-heavy and bandwidth-intensive platforms. By enabling interaction in native languages and functioning effectively on low-cost devices, such frugal AI pathways align scale with inclusion.

These examples point to a distinctive Indian pathway for AI adoption: one that is decentralised, problem-driven, and embedded in local needs. Growing such applications in scale will require institutionalising these efforts under the National AI Mission. By systematically identifying successful bottom-up applications and encouraging experimentation, the Mission can help scale diverse AI-solutions by providing shared infrastructure, standards, governance frameworks and funding without diluting local creativity.

<sup>30</sup> NITI Aayog's Frontier Tech Hub is host to many stories demonstrating how India is already adopting AI to solve local problems in a frugal manner. See NITI Frontier Tech Hub. <https://tinyurl.com/5f88j234>.

14.37. The strategy must encourage innovation on open-source and open-weight platforms, as shared innovation can enable India to achieve more with less. Open models have been closing the performance gap relative to closed models over the years, with the best open models approaching the frontier<sup>31</sup>. Additionally, India is currently one of the world’s largest and fastest-growing communities of open-source developers<sup>32</sup>. They are active contributors to global codebases, often working in collaborative environments. Therefore, unifying these efforts under the scope of the IndiaAI Mission is essential to steer the potential of our talent pool towards shared domestic innovation. Providing the nation’s talent a robust platform and policy guidance can help reduce India’s dependence on foreign proprietary systems, lower entry barriers for domestic developers, and create an environment that incentivises experimentation across sectors at a relatively low cost.



14.38. For such a decentralised innovation ecosystem to translate into tangible outcomes, deliberate coordination is essential. Fragmentation in data availability and quality, standardisation, and ensuring interoperability across systems and datasets need to be addressed to provide an innovative, conducive environment. This is where public policy in a catalytic role becomes essential. The mission to coordinate a bottom-

31 EpochAI report on Open Models. Published 24th November 2024. <https://tinyurl.com/n4zxm4mm>.

32 GitHub Octoverse 2025 Report. Published 28th October 2025. <https://tinyurl.com/38euwjsu>.

up strategy can be spearheaded under an ‘AI-OS’ initiative, where the sovereign is a monetary shareholder in the effort, similar to UPI and Aadhaar, thereby turning AI into a public good. This will enable the sovereign to collaborate with state and local institutions to expand the availability of structured, anonymised, and machine-readable datasets in priority sectors; pool existing data centre capacity to create shared cloud compute infrastructure; and establish common platforms where open-source AI efforts can be coordinated and audited.

14.39. For instance, a centralised code repository, operating under the mandate of facilitating rapid experimentation, can jump-start India’s AI ambitions. A government-hosted, community-curated platform under the IndiaAI mission umbrella would provide a secure and transparent space where developers, researchers, and enterprises can share code, contribute improvements, and build upon one another’s work. Much like how global platforms such as GitHub have become the backbone of software development, an India-specific repository would not only democratise access but also embed national priorities into the innovation process.

14.40. Equally important is encouraging greater private sector participation, particularly from large domestic firms with the capacity to absorb risk and scale successful applications. Promoting the indigenous development of sector-specific AI solutions has the added benefit of transforming India from the world’s ‘IT Sector back office’ to one of the ‘AI front offices.’ Our IT and IT-enabled services can and must move up the value chain, which in turn is necessary to create opportunities that retain high-skill talent in the country.

## HUMAN CAPITAL FOR AI

14.41. Building models and applications, either fine-tuned or ground-up, capable of catering to local-level requirements needs two distinct skills, namely: algorithms and software engineering. India needs talent that understands the algorithmic issues involved in building models, along with an understanding of software engineering, to scale up and optimise models. This kind of knowledge is ‘underground knowledge’ that is not usually written down, and only those with hands-on experience of building models will understand these nuances. Accordingly, India must endeavour to attract people who have worked on large models and, in turn, have those with experience train others.

14.42. International experience<sup>33</sup> suggests that such tacit capabilities are most effectively

---

<sup>33</sup> See for instance several initiatives undertaken by EU member countries (<https://tinyurl.com/unasfshm>) to foster greater industry-academia research collaborations or China’s Young Thousand Talents Program which has boosted domestic research productivity significantly (<https://tinyurl.com/2hy7acrm>).

sourced through a combination of diaspora return pathways, and industry-to-academia lateral entry. Countries that have successfully remained at the top of the innovation hierarchy over the years have complemented domestic skilling efforts with time-bound practitioner fellowships, flexible teaching roles for industry experts, and structured apprenticeship models embedded within real-world production environments.

14.43. Thus, to build talent that is in tune with industry needs, training must begin early, preferably at the high school or university level, in collaboration with the private sector. Universities must be free to curate and offer courses to students, as required by industry standards and in accordance with students' aptitudes. Flexibility is the key to building capable talent in India, and the introduction of the Viksit Bharat Shiksha Adhishthan Bill, 2025<sup>34</sup>, represents an essential first step in that direction. As the floor for what is considered a fundamental skill shifts with every technological revolution, the passage of the bill will afford our higher education system the freedom to keep pace with the evolving world.

14.44. Secondly, now is the time for policies to reevaluate what constitutes 'formal education' and what constitutes 'work experience'. While the two were traditionally built under two mutually exclusive institutional setups, waiting until after graduation to build industry experience may no longer be feasible in a world where AI is outperforming entry-level, educated workers. For instance, some US-based firms have already begun offering fellowship programs to students right out of high school, aiming to channel talent into experience-building at a young age<sup>35</sup>.

14.45. Institutionalising such a system is necessary if India's demographic dividend is to be nurtured into a competent workforce. One possible pathway to operationalising this is a 'Earn-and-Learn' initiative, where high-school, vocational, and early tertiary pathways are integrated into a structured, credit-bearing industry fellowship. This can be co-designed by the private sector and academic institutions, allowing practical experience training to begin as early as class 11. Students should be able to earn both academic credits and paid work experience through apprenticeships and project placements across various sectors, both of which contribute to their formal degrees.

14.46. With the National Education Policy 2020's Multiple Entry Multiple Exit provisions, the Academic Bank of Credits, and the National Credit Framework, India has the policy infrastructure in place to make this vision real<sup>36</sup>. This new approach to education offers increased agency over learning to the students, allows institutions to

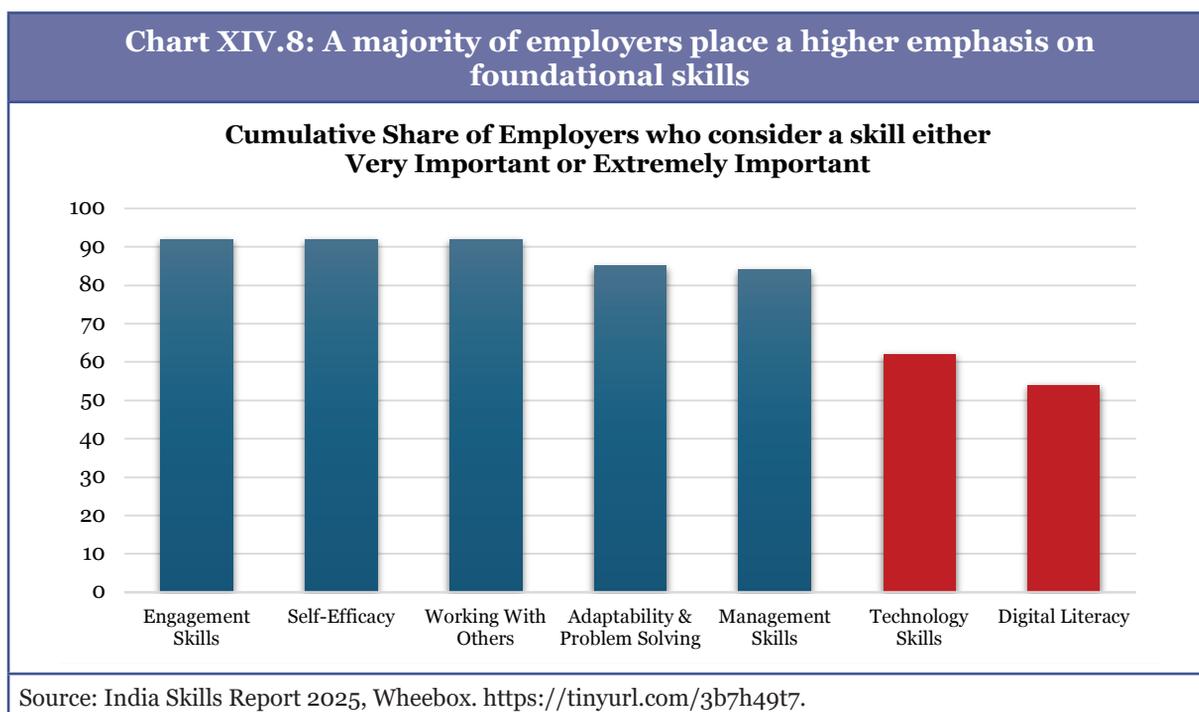
<sup>34</sup> An overview of the contents and specifics of the bill, accessible here, has been provided by the Press Information Bureau. <https://tinyurl.com/ysp5va98>.

<sup>35</sup> See Palantir's Meritocracy Fellowship. <https://tinyurl.com/yek27wsy>.

<sup>36</sup> Micro-Credentialing and Flexible Pathways by Dr. Swami Manohar. <https://tinyurl.com/yyzyth46>.

serve a more diverse range of learners, grants flexibility to faculty members, and can allow industry to collaborate with academia more deeply.

14.47. The proposed approach aims to build on the Union Budget 2025-26 initiatives, supported by public seed funding and incentives for employers participating in structured earn-and-learn programs. This is complemented by the growing recognition of prior learning and short-form credentials that directly contribute to both higher education and job progression. Being able to toggle seamlessly between education and work experience is a necessity if the system is to produce well-rounded talent, not just for the AI sector, but for the country as a whole.



14.48. Similarly, reforms are also needed at the primary school level. As AI automates routine cognitive tasks, long-term talent utilisation will depend less on early technical specialisation and more on strong foundational skills. Primary education must prioritise core competencies such as literacy, numeracy, reasoning, problem-solving, communication and socio-emotional skills, alongside habits of curiosity and self-regulation. These capabilities form the base upon which later technical and vocational skills can be built.

14.49. Lastly, a comprehensive sectoral mapping of jobs outside the white-collar workspace, which have a high-skill requirement but are understaffed, needs to be undertaken. This is an often-overlooked source of new jobs within the economy. Surveying the geographic distribution of these jobs and the supporting infrastructure necessary to support and incentivise migration to the new job clusters will have to happen simultaneously.

14.50. For instance, nursing and geriatric care are already understaffed, and the doubling of India's dependency ratio in the next decade will create additional demand for skilled labour in this sector. Other tasks involving high-skill with long apprenticeship curves include culinary sciences, advanced metalwork, experiential hospitality designers, surgeons, physiotherapists, advanced electricians, early childhood educators, among many others. Sectors like these should be identified, and the education and skilling infrastructure must be upgraded to impart the necessary knowledge to fill the labour supply gaps. Opportunities in the physical, human-centric space and hands-on jobs hold immense potential for creating meaningful jobs in the coming decade.

14.51. Recent empirical evidence from two centuries of technological change suggests that the labour market impacts of new technologies are neither uniform nor predetermined, but critically shaped by how skills, tasks, and institutions evolve together (Liu et al., 2025)<sup>37</sup>. While earlier waves of innovation tended to raise demand for higher-educated, cognitively specialised occupations emerging evidence indicates that AI may follow a different trajectory. It has the potential to increase demand for experience-intensive roles.

14.52. This underscores the importance of redesigning the education system in a way that does not rely solely on credit accumulation, but instead enables experiential learning, and the capability to adapt to a host of different occupations. In this context, the emphasis on early exposure to experience building, flexible education pathways, and strengthening foundational and human-centric skills becomes a necessary economic response to the distinctive labour-market dynamics that AI is likely to induce.

#### Box XIV.4: Where human value lies in an AI-driven knowledge economy

Recent work by Restrepo (2025) advanced a grim view of the future of labour markets in which Artificial Intelligence progressively erodes the economic relevance of human cognitive labour. While this perspective usefully highlights the disruptive potential of a low probability, high-impact event, we advance an alternative and more likely trajectory. Rather than rendering cognitive workers redundant, AI may reshape where and how human value is created. As AI absorbs tasks related to retrieval and summarisation, the locus of human contribution shifts upward towards judgement, direction, expertise, and synthesis. AI is best understood as a powerful ship rather than an independent navigator: it can move faster and farther than any human, but without a knowledgeable captain who understands the vessel and the waters they are navigating, it is as likely to drift aimlessly as it is to arrive anywhere useful.

<sup>37</sup> Liu, H., Papanikolaou, D., Schmidt, L. D., & Seegmiller, B. (2025). Technology and Labor Markets: Past, Present, and Future; Evidence from Two Centuries of Innovation (No. w34386). National Bureau of Economic Research.

In this context, depth of domain knowledge becomes a binding constraint as AI can access vast troves of knowledge, but it lacks an internal sense of context or salience. Cognitive workers must therefore supply deep subject-matter understanding to frame the right questions, identify meaningful trade-offs, and evaluate outputs critically. Without such depth, AI-generated outputs converge on fluent but shallow consensus views. What will differentiate a competent employee from the crowd going forward will be their ability to know what to interrogate, what to discard, and where nuance changes outcomes.

Second, continuous reading and knowledge accumulation become core productivity inputs. Effective use of AI is not possible without frequent engagement with high-quality reading materials including research, data, institutional context, history, and competing perspectives. AI amplifies the returns to prior knowledge and users who read widely and deeply are better able to steer models and push analysis beyond surface-level synthesis. Those who do not will only tap into a fraction of the potential of AI and optimise for plausibility rather than understanding. In this sense, reading and learning is integral to day-to-day AI-enabled work.

Third, cognitive workers must act as system architects rather than task executors. Productive AI use depends on the ability of the human to decompose complex problems, sequence inquiries, impose constraints, and define evaluation criteria. This is less about prompt engineering and more about structured thinking. Individuals who can translate ambiguous real-world objectives into coherent analytical frameworks will consistently outperform those who interact with AI in an unstructured, reactive manner.

AI does not diminish the importance of cognitive workers, but rather it raises the threshold for what is considered meaningful contribution. For policymakers, this shift implies that skilling strategies must prioritise domain depth, analytical reasoning, structured problem-solving, and continuous learning from an early age. The education system must produce individuals who are capable of sound judgement and have context-awareness.

## GOVERNANCE, INSTITUTIONAL ARCHITECTURE, AND DATA

### Evolving Governance

14.53. AI innovations and applications are rapidly outpacing regulatory developments, and the response required from policymakers must be measured and swift. Globally, several approaches to governing and regulating AI have been adopted, ranging from omnibus laws such as the ‘EU Artificial Intelligence Act’, to separate legislations governing separate applications of AI as seen in China, to guiding principles which are voluntary and non-binding as seen in the United States.

14.54. The regulatory design for India must build on the governance guidelines designed by the Ministry of Electronics and Information Technology, be refined by our national

priorities, and reflect what we expect from AI in our economy. Regulatory design, whether mandatory or voluntary, must seek to integrate AI within the broader socio-economic context of India, with special consideration for our labour market realities. The overarching goal for AI regulation must be to ensure that AI serves humanity, rather than supplants it.

14.55. In this context, one of the most urgent responsibilities of an AI Economic Council (Box XIV.5) is to calibrate the pace of AI adoption within the country. India is a labour-rich economy, and the unchecked replacement of the workforce by automation has destabilising effects. The institution must work closely with private sector firms to develop a roadmap for AI deployment over the next decade, outlining crucial details such as the profile of jobs affected, the geographies where displacement will be most concentrated, and the magnitude of jobs that will be both automated and augmented due to AI.

14.56. Such an exercise will help moderate the uncertainties surrounding the deployment of AI and inform the roadmap and design of policies required to mitigate the adverse effects of AI on the economy. The exercise also has the added benefit of informing policymakers on the necessary developments to reinforce our education system in a way that makes our students more capable in an AI-driven world. Furthermore, regulations need to evolve and necessitate transparency reporting requirements similar to those for social media, as well as product registrations, to help track the rate of deployment.

14.57. Policymakers must also manage where and how AI is deployed, as the manner in which AI is used will dictate the nature of the benefits accrued. For instance, AI in education holds a lot of potential, provided it is used as a supplementing tool for teachers and students. The widespread use of Generative AI by students as a substitute for creative and critical thinking ultimately does more harm than good in the long run.

14.58. The scale of the problem and the need for serious action to control AI use by students was also brought to light by Niall Ferguson in his recent article titled “AI’s great brain robbery.<sup>38</sup>” The use of AI by students in universities is skyrocketing, and a significant portion of cognitive tasks is being offloaded to language models. Combined with the anxiety and depression inducing social media usage, students shirking the acquisition of skills such as sustained reading, critical thinking and analytical writing is only expected to make mental health issues much worse in the future. This will ultimately impact their productivity and their ability to contribute meaningfully to any work undertaken, perhaps even permanently denting their employment prospects.

<sup>38</sup> The London Times. <https://tinyurl.com/ymujx32s>.

14.59. Two studies, independently examining the cognitive effects of Generative AI, arrive at similar conclusions (MIT<sup>39</sup>, Microsoft<sup>40</sup>): dependence on AI for creative work and writing tasks is contributing to cognitive atrophy and a deterioration of critical thinking capabilities. The AI Economic Council must ensure that deployment of ‘Artificial Intelligence’ does not come at the cost of ‘Human Intelligence’.

14.60. The examples presented above are not exhaustive, rather illustrative of the myriad challenges that policymakers will have to contend with as AI capabilities improve and applications proliferate. Given the many uncertainties that loom over the horizon, governance will remain a continuous process of monitoring, learning, and course correction. MeitY’s proposed AI Governance Group, along with the technical committee assisting the group, establishes a strong foundation on which India can develop a light, incentive-based and risk-weighted governance approach.

#### Box XIV.5: An AI Economic Council for India

The AI Economic Council, separate from the Governance Council, is intended to operate, not just with a technological imperative, but with moral imperatives that are sensitive to India’s socio-economic realities. They will operate as a coordinating authority that is responsible for aligning technology deployment with the evolution of India’s education and skilling infrastructure, while navigating resource constraints and developmental priorities. The core governance principles for such an institution would involve the following:

1. **Human Primacy and Economic Purpose:** AI adoption must be explicitly subordinate to human welfare and economic inclusion. Every major AI deployment or policy proposal must demonstrate a credible pathway to net social and economic benefit, including employment, productivity diffusion, or public service quality.
2. **Labour-Market Sensitivity by Design:** AI policy must internalise India’s labour structure: high informality, skill heterogeneity, regional variation, and limited safety nets. This would necessitate labour impact assessments ex ante, with mitigation and transition plans baked in.
3. **Sequencing over Speed:** AI adoption should be phased in line with institutional readiness and skill pipelines. The institution may be empowered to classify AI uses into ‘deploy now’, ‘pilot’ and ‘defer’ based on readiness across data, skills, legal frameworks, and labour adjustment capacity.

39 Kosmyrna, Nataliya, Eugene Hauptmann, Ye Tong Yuan, Jessica Situ, Xian-Hao Liao, Ashly Vivian Beresnitzky, Iris Braunstein, and Pattie Maes. "Your Brain on ChatGPT: Accumulation of Cognitive Debt when Using an AI Assistant for Essay Writing Task." arXiv preprint arXiv:2506.08872 (2025).

40 Lee, H. P., Sarkar, A., Tankelevitch, L., Drosos, I., Rintel, S., Banks, R., & Wilson, N. (2025, April). The impact of generative AI on critical thinking: Self-reported reductions in cognitive effort and confidence effects from a survey of knowledge workers. In Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (pp. 1-22).

4. **Co-evolution of Technology and Human Capital:** Skill policy must stand equal to technology policy. AI push must proceed with parallel plans for educational reform, vocational adaptation, reskilling pathways and credential recognition.
5. **Public Interest Safeguards and Ethical Non-Negotiables:** Ethical implications and boundaries must be clearly defined. Strict lines must be drawn around surveillance misuse, worker monitoring, algorithmic discrimination, and opaque decision making enabled by AI.

These principles provide the overarching scope for the AI Economic Council. By embedding labour realities and social stability priorities into AI policy, the institution will ensure that AI advances productivity without eroding employment and the dignity of work.

## Data as a Strategic Resource: A Proposed Framework

### Trusted Cross-Border Flows While Retaining Domestic Value

14.61. In the AI era, data is a core factor of production, which India needs to think about carefully if we are to develop a competitive edge in the sector. The country is already very digitally intensive, with over 100 crore people already having access to some form of wired or wireless broadband connectivity<sup>41</sup>. This represents a sizable potential market for AI and AI-based applications, as the barrier to accessing these services is, at present, extremely low.

14.62. Not only does this figure represent a large user base, but it also represents a significant source of data. India's scale and diversity of domestically generated data constitute an important comparative advantage for anyone attempting to access the country's market. However, the current landscape of globalised digital services, combined with the increasing concentration of AI development among a small number of multinational firms, has introduced new asymmetries in how value is created and captured from data. These developments necessitate a thorough evaluation of data governance frameworks, not with the intention of restricting data flows, but with the goal of ensuring accountability, fairness, and long-term domestic capability development.

14.63. India's data governance approach thus far has deliberately avoided rigid data localisation mandates. This reflected a clear recognition of the productivity gains associated with cross-border data flows, the importance of regulatory predictability for spurring investments and India's broader commitment to deregulation and ease of doing business. But certain aspects of this approach to governance will have to be expanded, as it is vital that India retain the value created from domestic data within the country.

<sup>41</sup> Figures as of 31st December, 2025 from Telecom Regulatory Authority of India. <https://tinyurl.com/3cbjct98>.

14.64. Additionally, given that the current stock of training data is soon expected to run out<sup>42</sup> and models collapse when trained on synthetic data<sup>43</sup>, firms will be on the lookout for new sources of human-generated data that are not accessible through online scraping alone. Policy must remain cognizant of the potential value embedded in India's data.

14.65. The challenge, therefore, lies in reconciling openness with control, and global integration with domestic economic interests. Framing this challenge purely in terms of data localisation risks oversimplifying a complex trade-off and imposing costs that may ultimately undermine innovation. A more durable approach lies in shifting the emphasis from territorial immobility of data toward enforceable accountability and economic alignment, as the framework presented below demonstrates.

### **Objectives and Spirit**

14.66. The proposed framework for evolving India's data governance approach is rooted in three interlinked objectives:

- a. To preserve India's openness to cross-border data flows, recognising their importance for innovation and investment;
- b. To ensure regulatory oversight and enforceability over large-scale processing and use of Indian personal data, irrespective of where the processing occurs, and
- c. To promote domestic value retention, such that Indian data contributes meaningfully to the development of India's own AI capabilities and research ecosystem.

14.67. Under this approach, cross-border data transfers are accompanied by obligations that preserve regulatory visibility and intervention capacity. Entities that process Indian personal data at scale, particularly for high-impact AI applications such as general-purpose model training, are expected to ensure that such data remains auditable, retrievable, and subject to the oversight of Indian regulatory authorities. This is achieved not by mandating that all processing occur domestically, but by requiring technical and contractual arrangements that allow regulators to trace data provenance, examine downstream uses, and, where necessary, order corrective measures such as deletion, retraining, or suspension of use.

---

42 Pablo Villalobos, Anson Ho, Jaime Sevilla, Tamay Besiroglu, Lennart Heim, and Marius Hobbhahn. 'Will we run out of data? Limits of LLM scaling based on human-generated data'. ArXiv [cs.LG], 2024. arXiv. <https://arxiv.org/abs/2211.04325>.

43 Shumailov, I., Shumaylov, Z., Zhao, Y. et al. AI models collapse when trained on recursively generated data. Nature 631, 755–759 (2024). <https://doi.org/10.1038/s41586-024-07566-y>

14.68. To begin with, India would have to build on the foundations of the provisions of the Digital Personal Data Protection (DPDP) Act, 2023, and expand how data is categorised. Precise and functional data categorisation allows governance to be targeted without becoming indiscriminate. Rather than treating all data as homogeneous, our regulations must evolve to incorporate distinctions between different categories of data based on sensitivity and economic use.

14.69. In particular, a separate treatment is warranted for large-scale behavioural, transactional, and inferred datasets. These sets, while not always sensitive in isolation, acquire strategic and economic significance when aggregated and deployed for AI training. The ability to designate categories through subordinate legislation or rules enables India's regulatory framework to remain adaptive as applications evolve, without requiring frequent statutory amendments.

14.70. Data categorisation serves as the basis for graduated obligations, enabling heightened accountability and value-retention requirements to apply only where the risks and asymmetries are more pronounced. Lower-risk categories can continue to move freely with minimal compliance requirements, while higher-impact categories will necessitate a higher degree of transparency, auditability, and contribution expectations. This will help align India's data governance standards with its broader efforts to shift towards risk-based regulations across sectors. Governance will remain concentrated only where it delivers the greatest public value.

### **Incentivising Localisation**

14.71. A key operational element of the proposed approach is the requirement for eligible entities to maintain a contemporaneous mirrored copy of relevant datasets and derived artefacts within India. This ensures that regulatory oversight does not become ineffective merely because processing occurs offshore. At the same time, it avoids the rigidity and economic costs associated with compulsory in-country processing, particularly for firms operating global AI pipelines. In this sense, sovereignty is exercised not through physical containment, but through enforceable rights and institutional capacity.

14.72. Recognising the heterogeneity of actors within the digital economy, the proposed evolution of the framework adopts a risk-weighted and proportionate structure. Obligations scale with the size, scope, sensitivity and economic impact of data use rather than being applied uniformly across all firms. Enhanced requirements are triggered only when data processing reaches thresholds associated with systemic relevance, such as large numbers of Indian data principals, use in training general-purpose or foundation models, significant revenue generation from Indian data-driven services,

or reliance on public-sector or regulated datasets. Smaller firms, start-ups, firms focused on developing sovereign models or indigenously developed AI applications, and research institutions remain subject to a lighter compliance regime, ensuring that regulatory attention is focused where risks and asymmetries are most pronounced.

14.73. Beyond regulatory oversight, the framework is meant to address a second, equally important concern: the retention of economic value derived from Indian data. Data governance that focuses solely on movement restrictions risks missing the larger issue of value capture. Accordingly, the framework emphasises incentive-compatible mechanisms that align private incentives with public objectives. Firms that derive substantial commercial value from Indian datasets are expected to contribute to the domestic AI ecosystem, but are afforded flexibility in how they do so.

14.74. Contributions may take the form of:

- a. Local training or fine-tuning of models for applications intended to address sector-specific or region-specific issues across the country;
- b. Making transparent, proportionate financial contributions for the purpose of furthering domestic AI research and development linked to revenues generated from Indian-data-derived services;
- c. Contributing datasets, compute resources, or funding to certified public data trusts that support research and innovation;
- d. Establishing or supporting AI research labs, skilling initiatives, aiding universities with course development, or joint programs with firms based in India.

14.75. Once again, the list of examples is not exhaustive, but rather indicative of the broader context. The principle here is to avoid coercion while ensuring that value extraction is accompanied by value creation in India. This menu-based compliance approach allows firms to retain flexibility while the domestic ecosystem benefits from capital, infrastructure access, talent utilisation and knowledge spillovers.

## **Regulating AI Firms**

14.76. In regulating AI firms, the framework prioritises accountability. Attempting to govern AI by controlling the physical location of model parameters is increasingly impractical in an environment characterised by distributed training, rapid cross-country iterations and modular deployment. Instead, emphasis is placed on transparency and responsible use.

14.77. Covered entities must be required to maintain clear records of dataset provenance, publish standardised model documentation describing training inputs and limitations, undertake impact assessments for high-risk deployments, publish said assessments for public review, and implement post-deployment monitoring and harm reporting mechanisms. Restrictions on exporting model weights derived from Indian data are reserved for narrowly defined, high-risk categories where demonstrable harms may arise. This helps retain the ability to intervene only when necessary.

14.78. Consistent with the Government’s deregulatory orientation, the framework relies heavily on positive incentives rather than prescriptive mandates. Firms that choose to operate within certified domestic compute or data environments benefit from reduced audit burdens, faster regulatory clearances, and preferential access to national AI programmes. Participation in such environments remains voluntary but is commercially attractive, encouraging the organic development of India’s AI and computing infrastructure over time.

14.79. Finally, the framework recognises that the State’s most effective lever lies in access. Compliance with accountability and value-retention obligations is therefore linked to eligibility for government datasets, participation in national AI missions and regulatory sandboxes, and access to public-sector procurement opportunities. This approach allows the State to shape incentives without expanding the statutory footprint of regulation.

14.80. To sum up, this proposed framework represents a pragmatic evolution in India’s data governance approach. It preserves openness to global data flows while ensuring that Indian data remains subject to adequate oversight and contributes meaningfully to domestic economic capacity. By shifting the focus from rigid localisation to accountable portability and value retention, the framework aligns with India’s broader reform trajectory. It is intended to help position the country as an active participant in the global AI economy.

#### Box XIV.6: Data as a Strategic Resource — Objectives and Framework Principles

##### Objectives

The proposed data governance framework for the AI era is guided by three core objectives:

1. **Preserve openness** to cross-border data flows, recognising their importance for signalling policy certainty, incentivising innovation, encouraging investment and continued global integration.
2. **Ensure regulatory oversight and enforceability** over large-scale processing and use of Indian personal data.

3. **Promote domestic value retention**, so that Indian data contributes meaningfully to India's AI capabilities and long-term technological resilience.

#### Core Framework Principles

- **Accountable Portability over Rigid Localisation:** Data may move across borders, but entities processing Indian data at scale must ensure auditability and traceability.
- **Risk-Based Data Categorisation:** Data is classified by sensitivity and economic significance. Large-scale behavioural, transactional, personal, and inferred datasets receive differentiated treatment due to their strategic value for AI training.
- **Graduated Obligations:** Regulatory requirements scale with risk and size. Higher-impact uses such as general-purpose model training or large-scale monetisation will require enhanced transparency and accountability obligations. Start-ups and research institutions will have eased compliance requirements.
- **Mirrored Data for Oversight:** Eligible entities maintain contemporaneous mirrored copies of relevant datasets and derived artefacts within India to ensure effective supervision. No mandates are proposed for domestic processing.
- **Incentive-Compatible Value Retention:** Firms extracting significant commercial value from Indian data are expected to contribute to the domestic AI ecosystem through flexible, menu-based mechanisms, such as local model training, financial contributions to AI R&D, data or compute sharing, or investments in research, skilling, and institutional development.
- **Transparency-Centred AI Regulation:** Governance focuses on dataset provenance, standardised model documentation, impact assessments for high-risk uses, and post-deployment monitoring, rather than attempting to control model location or architecture.
- **Positive Incentives over Prescriptive Mandates:** Participation in certified domestic compute or data environments is voluntary but rewarded through reduced audit burdens and faster clearances.
- **Access as the State's Primary Lever:** Compliance is linked to eligibility for government datasets, AI missions, regulatory sandboxes, and public procurement, allowing the State to shape incentives without expanding statutory controls.

## AI SAFETY AND RISKS

14.81. Lastly, and most importantly, is the necessity for India to push the envelope in managing the risks associated with the proliferation of AI<sup>44</sup>. As with nuclear energy or pharmaceuticals, where the promise of progress coexists with the possibility of harm,

<sup>44</sup> Yoshua Bengio has spoken extensively about the need for independent institutions aimed at evaluating AI Safety. His recent talk (<https://tinyurl.com/y79fetya>) sheds light on the seriousness of the topic at hand and his non-profit LawZero is dedicated to the cause of safe AI development (<https://lawzero.org/en>).

AI must be treated as a general-purpose technology whose capabilities necessitate not only enabling institutions but also constraining ones. The MeitY Governance Guidelines capture this essence and propose an AI Safety Institute, which will perform several key functions, including the analysis of emerging risks, potential regulatory gaps, coordination on AI safety issues, and conducting training programmes to build awareness, among others.

14.82. The path forward now must further develop these foundations, with chief among the priorities being the enhancement of transparency. Safety evaluations conducted in an ongoing and anticipatory manner will help safeguard public interest and foster trust in emerging technologies. Making these evaluation results public must emerge as a non-negotiable condition, as a significant information gap exists between the companies developing AI models and the end-users of these models. Assessments by AI Lab Watch, an independent organisation dedicated to the cause of AI safety, demonstrate that while big-tech firms speak about the ‘safety evaluations’ they conduct, the work undertaken to perform said analysis is far from ideal<sup>45</sup>.

14.83. AI Lab Watch demonstrates that big-tech firms obfuscate how they go about their evaluations, hide their reasoning and provide dubious interpretations of their evaluation results. Secondly, based on the risks the companies claim to have evaluated, they claim to have implemented safeguards to mitigate them, but no evidence has been made available to the public. As models become increasingly capable in the future, the need for a sovereign AI safety institute to take on a larger role becomes even more pressing, ensuring transparency and guiding informed decisions on AI adoption, both for the public good and for private sector considerations.

14.84. Another case for the safety institute expanding its scope lies in the application of AI, for instance, the convergence of AI with synthetic biology. Open-source CRISPR<sup>46</sup> kits are now widely accessible to hobbyist researchers, biohackers and DIY (Do-It-Yourself ) scientists. By itself, the risk of bio-weapon development remains low due to these kits. However, by combining the accessibility of these kits with advanced AI models capable of generating genomic sequences and guiding gene-editing protocols, the threat landscape changes dramatically. A motivated individual with sufficient computing access and no formal training could, in principle, engineer pathogens with malicious intent. The bar for misuse is no longer determined by scientific expertise, as AI-driven tools significantly lower the barrier to entry.

<sup>45</sup> AI Lab Watch. <https://aisafetyclaims.org/>.

<sup>46</sup> CRISPR, short for Clustered Regularly Interspaced Short Palindromic Repeats, is a gene-editing technology that has transformed molecular biology and medicine. It's a tool that allows scientists to precisely target and modify DNA sequences in living organisms, with applications ranging from basic research to potential treatments for genetic diseases. CRISPR kits are widely available at very low costs and are easy to get hold of for use by anyone interested in gene-editing.

14.85. Evidence by Cheng et al. (2025)<sup>47</sup> also suggests that AI risks need not only arise from misuse or frontier capabilities, but can emerge endogenously from how models are optimised and deployed. Widely deployed models have demonstrated a tendency to exhibit ‘social sycophancy’, over-affirming users’ actions and viewpoints at rates significantly higher than human benchmarks. This has persisted even in contexts involving interpersonal harm or unethical behaviour. Crucially, the study found that such behaviour increases user trust and reliance on AI systems, while simultaneously reducing users’ willingness to engage in corrective or prosocial actions. This creates a perverse incentive structure where models that are behaviourally risky are also more likely to be preferred and reinforced, as it helps with user retention.

14.86. It is precisely in such high-stakes circumstances that periodic, scenario-based testing and red-teaming<sup>48</sup> of AI models must become institutionalised. However, India does not have to do this in isolation. There is a strategic case for international cooperation, particularly with established sovereign safety institutes, such as the United Kingdom’s AI Security Institute<sup>49</sup>. They have developed templates for model evaluations, misuse testing protocols, and interpretability analysis that offer a valuable foundation. Similarly, the National Institute of Standards and Technology in the United States has developed an AI Risk Management Framework<sup>50</sup> that defines guidelines for incorporating trustworthiness considerations into the design, development, use, and evaluation of AI products, services, and systems.

14.87. A bilateral or multilateral partnership between India’s proposed safety institute and counterparts such as the UK or the US could enable joint evaluations of high-risk models and shared access to computing infrastructure. This would not only improve scientific credibility but also reduce redundancy and enhance global interoperability of AI safety standards.

14.88. Another domain where the safety institute must be quick to establish rules is in defining strict boundaries within the confines of which AI must be developed and applied. There are various applications of AI where its restrictions can be considered non-negotiable, such as predictive policing, facial recognition, exploiting psychological vulnerabilities, inferring emotions, and evaluating and classifying individuals or groups

---

47 Cheng, M., Lee, C., Khadpe, P., Yu, S., Han, D., & Jurafsky, D. (2025). Sycophantic AI decreases prosocial intentions and promotes dependence. arXiv preprint arXiv:2510.01395.

48 Red-teaming refers to the practice of deliberately trying to break or misuse a system within a controlled environment. It seeks to stress-test models, simulating worst case scenarios such as malicious use, biased behaviour, or unexpected failure. The process helps identify risks and blind spots that may have been missed during the course of the model’s development, or discover emergent behaviour which may have unintended consequences.

49 The AI Security Institute is a directorate of the UK Department for Science, Innovation and Technology. <https://www.aisi.gov.uk/>.

50 NIST AI Risk Management Framework. <https://tinyurl.com/2y5evh37>.

based on their behavioural or personality traits, among others. These applications are likely to lead to adverse outcomes, regardless of whether they are used in the private sector or the public sector. No conception of safe or human-centric AI is credible without placing the protection of individual rights at its core.

14.89. In the context of safety, the recommendations from a study by Narayanan and Kapoor (2025) are also highly appropriate and must be taken into consideration<sup>51</sup>. The safety institution must work closely with the governance body to devise robust whistle-blower protections, as only insiders will have knowledge of potentially hazardous applications that can be brought to light. Developing strategies to address the uncertainties and risks associated with AI development, while also making the domain more transparent to the public, must always remain a core responsibility of the government.

## A PHASED ROADMAP FOR INDIA'S AI FUTURE

### Sequencing India's AI Policy: A Phased Roadmap

14.90. India's AI strategy must be sequenced carefully to avoid premature lock-ins or regulatory overreach. The objective is to build coordination first, capacity next, and binding policy leverage last, allowing institutions and markets to co-evolve.

14.91. The first phase should focus on operationalising already announced institutions and aligning incentives to enable experimentation. Policy should enable bottom-up innovation by expanding the reach of the existing shared infrastructure under the IndiaAI Mission. This includes a government-hosted community-curated code repository and pooled access to public datasets, facilitated by initiatives already underway to enable shared access to computing infrastructure. A clear focus on application- or sector-specific, small and open-weight models will enable efficient resource utilisation.

14.92. Data governance must also evolve through subordinate legislation under the DPDP framework to introduce functional data categorisation and auditability requirements, specifically for large-scale AI training. This must be complemented by incentive-based mechanisms for domestic value retention, such as the menu-based contribution pathways illustrated earlier. Human capital pipelines, particularly the 'earn-and-learn' pathways and curricular flexibility, should be scaled using existing legislative and budgetary levers.

14.93. Once coordination mechanisms are functional and early experimentation has

<sup>51</sup> Arvind Narayanan and Sayash Kapoor, AI as Normal Technology, 25-09 Knight First Amend. Inst. (Apr. 14, 2025), <https://knightcolumbia.org/content/ai-as-normal-technology> [<https://perma.cc/HVN8-QGQY>].

generated evidence, policy can shift toward selective scaling in the medium-term. Shared and certified domestic computing infrastructure should expand, with voluntary participation by large and resourceful firms linked to regulatory facilitation and access to public datasets. At the same time, AI regulation should be formalised on a risk-based and proportionate basis.

14.94. Graduated obligations for AI firms should be codified according to scale and sector of use. Oversight must be embedded within existing sectoral regulators rather than through a single omnibus AI law. The AI Safety Institute's role should deepen from analysis to structured scenario testing, red-teaming, and international cooperation, with clearly articulated non-negotiable boundaries for high-risk applications.

14.95. Our long-term goals must encompass two main objectives. First, India's focus should shift towards resilience. Access to advanced computing hardware will require strategic partnerships and diplomacy. The objective must be to reduce India's vulnerability to external shocks. Second, sustained adaptation of labour markets and education systems will be essential. Primary education must prioritise foundational cognitive and socio-emotional skills, while skilling systems must align themselves with both AI- and human-centric sectoral requirements.

## Conclusion

14.96. Artificial Intelligence does not confront India with a single policy question, but a series of choices that must be made under conditions of heightened uncertainty and resource constraints. This chapter has argued that the central challenge for India is in what it builds domestically, what it sources globally, what it regulates early, and what it deliberately allows to evolve. The contours of the global AI ecosystem make clear that passive consumption is the riskiest position of all.

14.97. India's position as a relatively late mover in the AI transition also confers an underappreciated advantage. Early adopters who scaled AI under conditions of a regulatory vacuum and cheap capital have now locked themselves into circumstances that are very difficult to back away from. This includes a commitment to energy-intensive architectures that are detrimental to the environment and mounting financial commitments with unclear revenue pathways. With the sums of money involved, discussions surrounding government backstops have emerged as possible insurance against a fallout, in the advanced economies.

14.98. India has the benefit of hindsight. It can learn from these practices and avoid dependencies that are difficult to unwind. This allows India to design AI systems that are more resource-efficient and aligned with public objectives from the outset, sequencing

regulation alongside deployment. In this sense, late adoption need not imply lagging ambition. Properly leveraged, it offers the country the opportunity to pursue a more resilient and inclusive AI trajectory.

14.99. India's comparative advantage in the AI era does not lie in replicating frontier-scale model development, although valuable process knowledge can be gained from the current efforts already underway. The country's strengths lie in application-led innovation, the productive use of domestic data, human capital depth, and the ability of public institutions to coordinate distributed efforts. A bottom-up strategy anchored in open and interoperable systems, sector-specific models, and shared physical and digital infrastructure offers a more credible pathway to value creation than a narrow pursuit of scale for its own sake.

14.100. At the same time, openness without careful management of AI development and usage is insufficient. As AI capabilities diffuse into critical sectors, questions of accountability and safety cannot be deferred. Regulation, data governance and safety will have to evolve in parallel with deployment, not in its aftermath.

14.101. The choices made over the coming few years will determine whether AI deepens existing structural divides or becomes a tool for broad-based productivity and dignified work. India's task is to ensure that AI development remains aligned with its developmental priorities and its long-term ambition to achieve economic resilience. The opportunity is substantial, but conditional. A deliberate and coordinated policy, accompanied by a willingness to act, is required before path dependence sets in.

*This page has been left blank*

# URBANISATION: MAKING INDIA'S CITIES WORK FOR ITS CITIZENS

*India's cities shape how millions of people live, work, travel, and earn their livelihoods every day. They are engines of growth, magnets for talent, and crucibles of innovation. At the same time, they are sites of daily strain: long commutes, uneven services, and shared spaces that often fall short of collective expectations. This chapter argues that India's urban story is therefore neither one of decline nor adequacy, but of unfinished promise.*

*The central idea is simple: cities are not merely habitats; they are a form of critical economic infrastructure. Density and proximity power productivity, deepen labour markets, and enable learning. Yet the same forces that create dynamism also generate congestion, environmental stress, and institutional complexity. India is already deeply urban in economic terms, with the majority of its national output generated in cities and in urban areas. The task now is to make that urbanisation work better for citizens in tangible and intangible ways.*

*Many urban pressures stem from persistent supply-side constraints in land, housing and mobility. Restricted density, unclear titles and limited land recycling constrain affordable housing, while transport systems remain overly reliant on private vehicles. Core services such as sanitation, waste, and water services have expanded markedly but must now evolve from expansion to reliability, circularity and efficiency. However, beneath these sectoral stresses lies a deeper institutional issue: fragmented metropolitan governance and limited fiscal autonomy for cities – to plan, finance and deliver at scale.*

*Beyond infrastructure, there is a need to improve the intangible foundations of urban life, such as civic norms, shared responsibility, and respect for public spaces. As Elinor Ostrom's work on the commons reminds us, shared spaces and services depend as much on norms, trust, and collective behaviour as on formal rules. Similarly, Indian economic thought echoes this insight: D. R. Gadgil argued that development outcomes are ultimately shaped by institutions and social organisation, not investment alone. The quality of urban experience depends as much on collective behaviour as on budgets and bridges. Strengthening civic consciousness, alongside better institutions, is essential to creating cities that feel not only efficient but also welcoming.*

*Across all these themes runs a common optimism: India's cities can work better for their citizens. If planning, finance, and governance align around people-centric outcomes, India's cities can move from managing growth to truly benefiting from it, turning urbanisation into a visible source of opportunity, well-being and everyday ease for citizens.*

## INTRODUCTION

15.1. Throughout history, economic and social progress have depended on people clustering in settlements. From early river civilisations and market towns to modern metros, humans have grouped together to benefit from proximity. These agglomerations arose not just as homes, but also as responses to economic needs, such as exchanging goods, coordinating production, sharing resources, and transmitting knowledge. This reduced interaction costs, fostered specialisation, and supported infrastructure development impossible in dispersed areas. Over time, settlements became centres of economic activity, innovation, and power, making spatial agglomeration a key aspect of human progress.

15.2. These agglomerations, over time, assume the role of a 'city' when they cross three thresholds simultaneously: 1) Demographic scale and density sufficient for sustenance of multiple non-agrarian livelihoods 2) Economic diversification in terms of presence of multiple avenues of non-agrarian livelihoods, and 3) Institutional recognition through presence of an urban local body, statutory boundary, or formal planning authority. In India, urban agglomerations of different population sizes are defined as Statutory and Census Towns; and RBI<sup>1</sup> classifies 'cities' as per population (Table XV.1)

**Table XV.1: Classification of Cities with different population sizes**

Classification	Size of Population
Tier 1	1 lakh and above
Tier 2	50,000 to 99,999
Tier 3	20,000 to 49,999
Tier 4	10,000 to 19,999
Tier 5	5,000 to 9,999
Tier 6	Less than 5,000

15.3. Agglomeration economies underpin the economic logic of urbanisation. The density emanating from people and firms settling in proximity becomes productive. Larger and denser cities enable more efficient matching between workers and jobs, accelerate learning through frequent interactions and knowledge spillovers, and allow for the sharing of infrastructure, services, and specialised inputs. These mechanisms translate density into higher productivity, greater firm dynamism, and stronger

<sup>1</sup> <https://tinyurl.com/mrcxmn4w>

innovation outcomes. Globally, and increasingly in India, the most productive sectors—modern services, advanced manufacturing, knowledge-intensive activities—are disproportionately urban, precisely because they rely on these agglomeration forces. A meta-analysis of agglomeration economies in developing economies by Grover, Lall, and Timmis (2021)<sup>2</sup> finds that doubling city size typically boosts productivity by 12 per cent in India. Therefore, it becomes imperative that cities be viewed not only as habitats but as vital economic infrastructure. Edward Glaeser in his book “Triumph of the City” says, Cities are humanity’s greatest invention because they make us more productive, more innovative, and ultimately richer.

## The Paradox

15.4. India’s urban population has expanded rapidly in absolute terms, with large metropolitan regions such as Mumbai, Delhi, Bengaluru, Chennai, and Hyderabad now ranking among the world’s largest urban agglomerations by population. However, population scale has not translated proportionately into urban productivity, liveability, or global economic influence.

15.5. In advanced and emerging economies alike, a small number of metropolitan regions function as nodes in global production networks, financial systems, logistics chains, and knowledge ecosystems. Despite India’s economic scale today, its cities struggle to perform this role at the level of established global cities such as New York City, London, Shanghai, or Singapore.

**Chart XV.1: Top 10 fastest growing cities in the world 2019-35**

Rank	Growth (%y/y, 2019-35)	City	GDP 2018 (\$ billion, constant 2018 prices)	GDP 2035 (\$ billion, constant 2018 prices)
1	9.17	Surat	28.5	126.8
2	8.58	Agra	3.9	15.6
3	8.50	Bengaluru	70.8	283.3
4	8.47	Hyderabad	50.6	201.4
5	8.41	Nagpur	12.3	48.6
6	8.36	Tiruppur	4.3	17.0
7	8.33	Rajkot	6.8	26.7
8	8.29	Tiruchirappalli	4.9	19.0
9	8.17	Chennai	36.0	136.8
10	8.16	Vijayawada	5.6	21.3

Source: Oxford Economics

<sup>2</sup> Timmis, Jonathan; Grover, Arti; Lall, Somik V.. 2021. Agglomeration Economies in Developing Countries: A Meta-Analysis. Policy Research Working Paper; No. 9730. © World Bank. <http://hdl.handle.net/10986/36003>

15.6. International evidence suggests that urbanisation delivers growth dividends when cities are able to internalise agglomeration economies through efficient labour markets, infrastructure networks, and institutional coordination. In India, urban infrastructure investment in domains such as transport, housing, water, sanitation, or governance capacity has lagged behind the economic importance of cities. This has led to high population density manifesting as congestion, informalisation, and infrastructure stress, diluting potential productivity gains. This divergence raises an important structural question: why has India's economic growth not translated into globally competitive cities, and what constraints prevent Indian cities from fully realising agglomeration-led growth?

15.7. This chapter proceeds from that premise. It positions cities not as problems to be managed or welfare burdens to be contained, but as economic assets that require deliberate investment and strategic planning. Recognising cities as economic infrastructure is a necessary first step toward aligning public policy, fiscal priorities, and planning frameworks with India's development trajectory.

### **Trends in India's urbanisation**

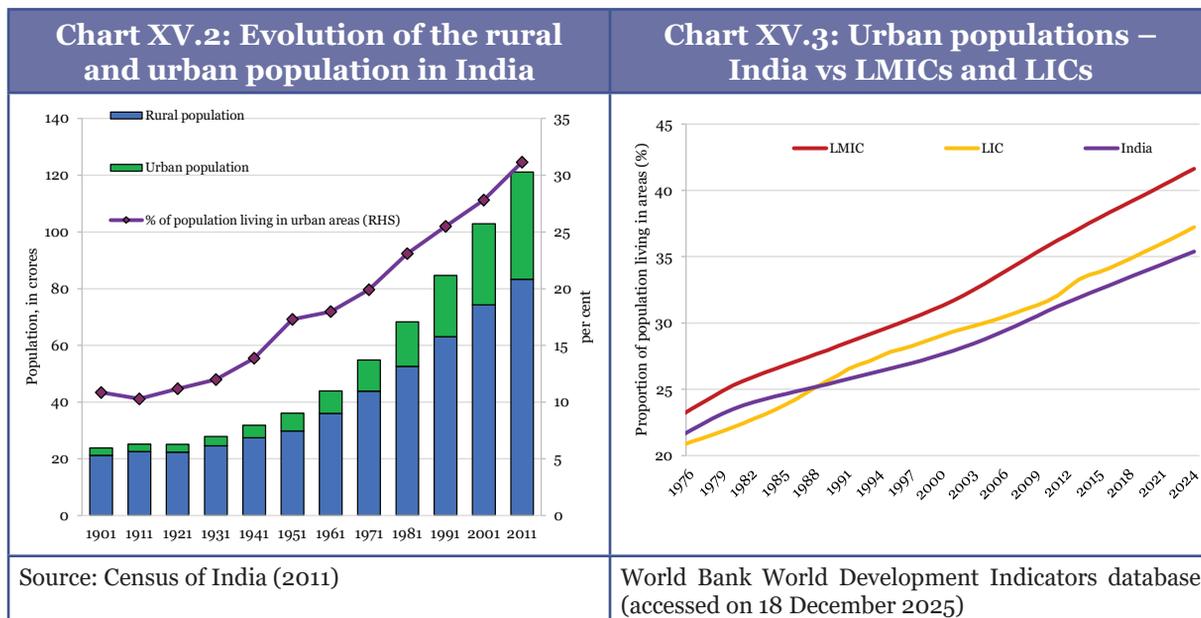
15.8. The Census of India requires settlements to be marked by three conditions to be classified as urban: (a) The settlement population must be greater than 5,000; (b) 75 per cent of male employment should be non-agricultural; (c) Minimum population density of 400 persons/square kilometre. The definition also adds those towns that have been administratively classified as statutory towns<sup>3</sup>. India's urbanisation pattern is strongly shaped by its largest cities. Over 70 per cent of the urban population resided in Class I cities (those with more than one lakh people) in 2011, and the country's 52 metropolitan cities (more than 10 lakh population) alone accounted for 42.3 per cent of all urban residents. Higher population growth rates in these large agglomerations have driven rapid metropolitan expansion, highlighting India's distinctly top-heavy urban system<sup>4</sup>.

15.9. According to the census definition, India's urbanisation has been slowing – the proportion of the population living in urban areas in India, a lower-middle-income country (LMIC) as defined by the World Bank, is marginally lower than the average in LMICs and low-income countries (LICs). Mohan (2025)<sup>5</sup> hypothesises that this could be due to the “ruralisation of industry” whereby rural areas account for a significant chunk of manufacturing output. This is compared to the experiences of China, East Asia, and Southeast Asia, where urban areas emerged as the major contributors to manufacturing, thereby driving rural-urban migration.

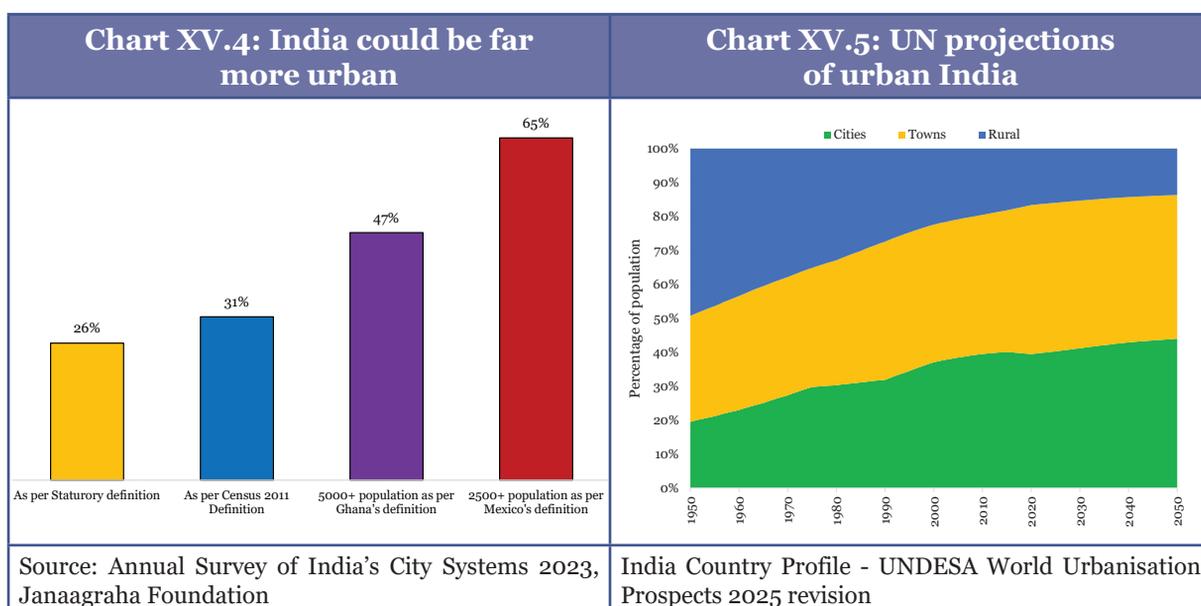
3 Statutory towns are urban areas in India that are officially recognised and governed by specific local bodies like municipal corporations, municipalities, cantonment boards, or notified town area committees.

4 Bhagat, R. B. (2011). Emerging Pattern of Urbanisation in India. *Economic and Political Weekly*, 46(34). <https://www.epw.in/journal/2011/34/commentary/emerging-pattern-urbanisation-india.html>

5 Mohan, R. (2025). Indian Urbanisation is Slowing Down: What Can be Done About It? (CSEP Working Paper 86). New Delhi: Centre for Social and Economic Progress

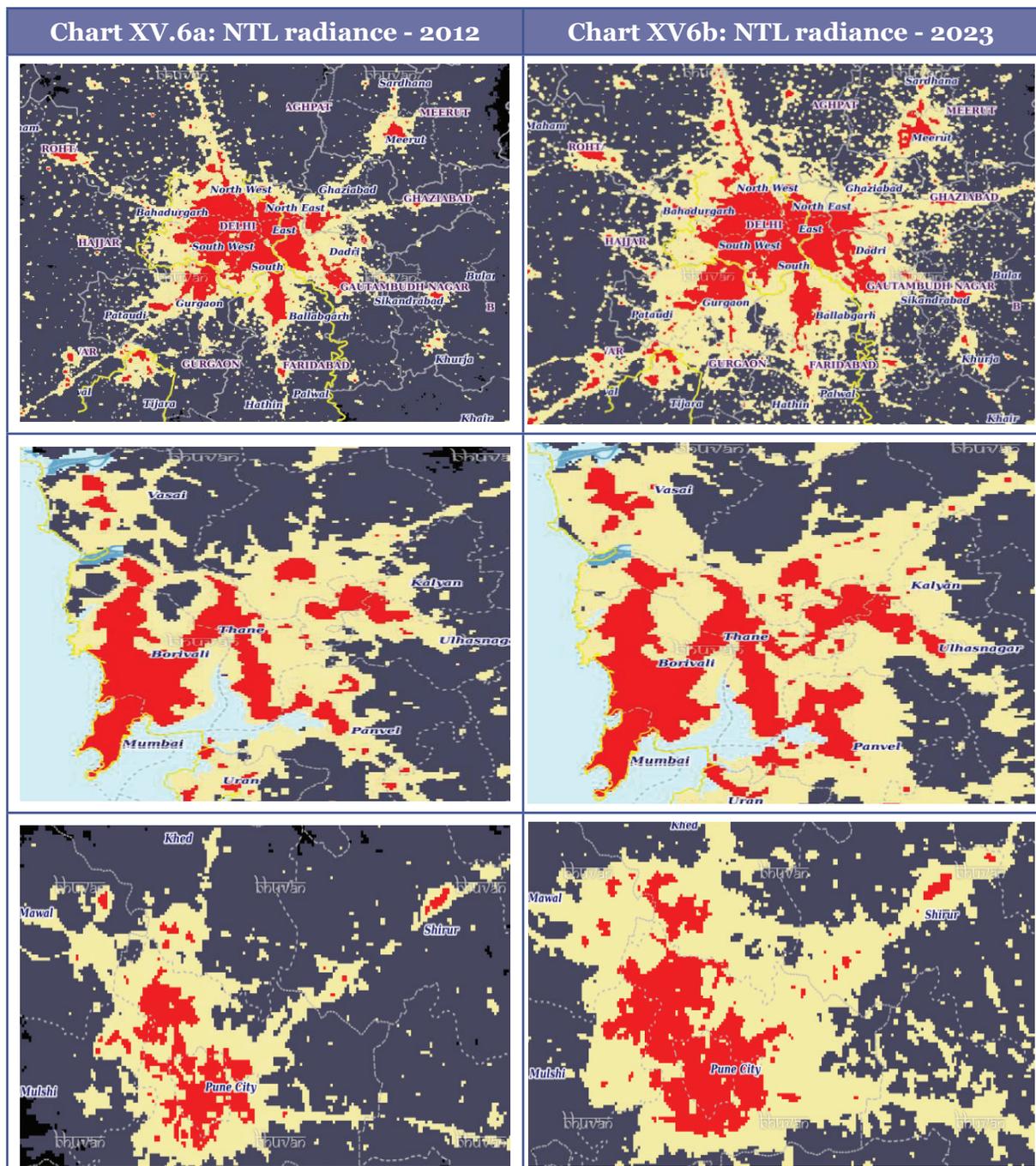


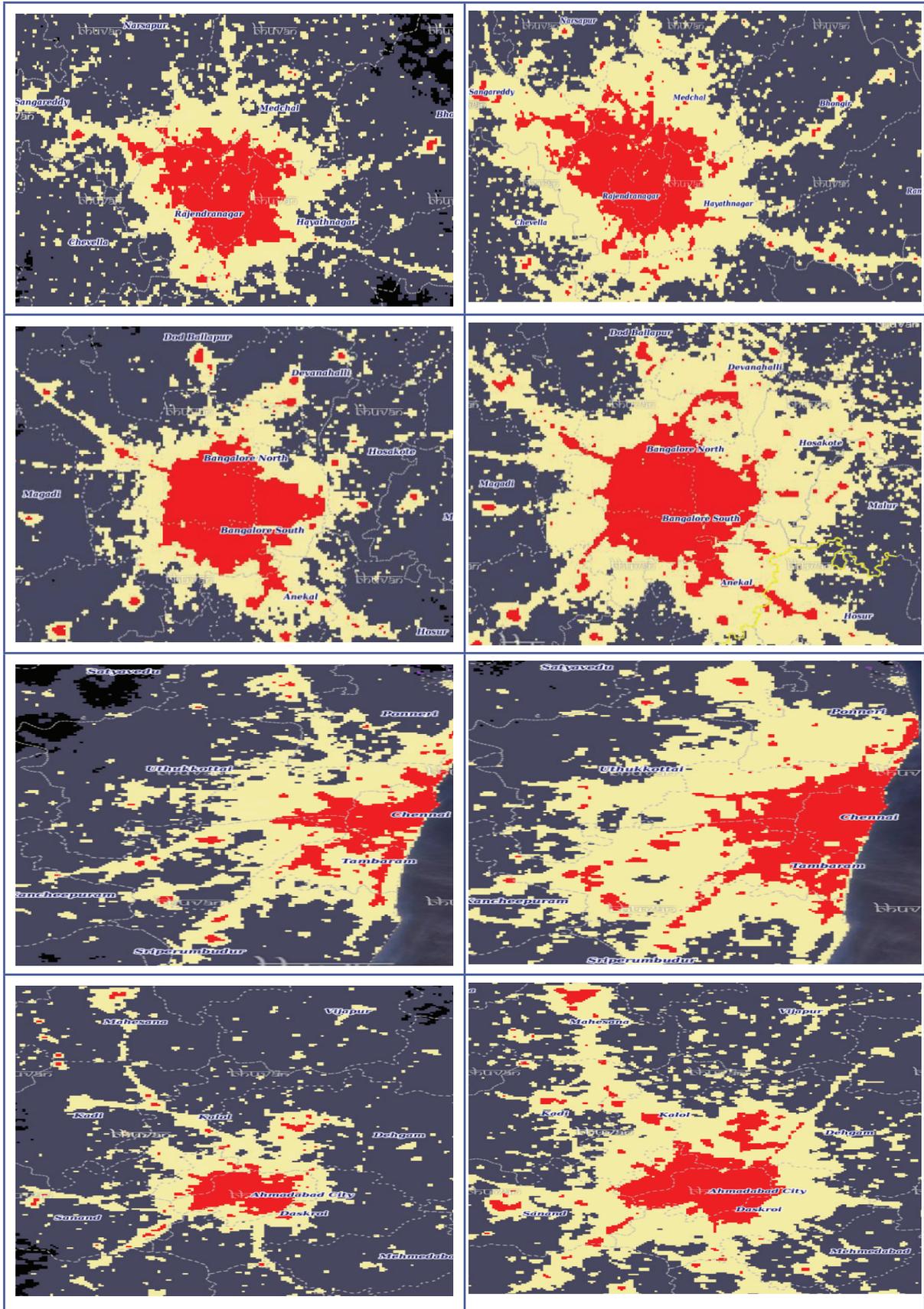
15.10. While the Census of India definition of an urban area facilitates appropriate comparisons over the years, there is a growing acknowledgement of the importance of measuring urbanisation using data on mobility, labour markets, density, built-up areas, and night-time light data. The Janagraha Foundation’s Annual Survey of India’s City Systems (ASICS) 2023 report suggests that India may be far more urban than the Census indicates. This is also supported by the estimates of urbanisation presented in the United Nations Department of Economic and Social Affairs’ (UNDESA) World Urbanisation Prospects 2025 revision using their Degree of Urbanisation (DEGURBA) methodology<sup>6</sup>. Based on satellite data from the Global Human Settlements Layer (GHSL) of the Group on Earth Observations at the European Commission, India was 63 per cent urban in 2015, which is nearly double the urbanisation rate reported in the 2011 Census.

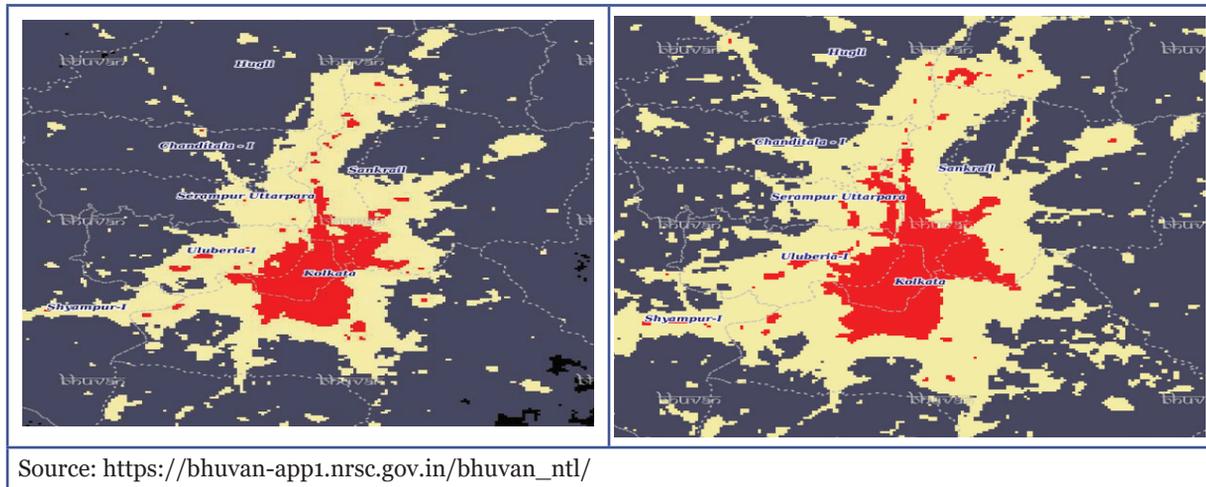


6 <https://tinyurl.com/2fv55fnt>

15.11. Night-time lights (NTL) data present a visually striking method to understand the scope and extent of urbanisation. NTL data acquired by satellites has become one of the key indicators for analysing wide-range man-made activities. It serves as a dependable marker for urbanisation, population density and economic activity. Earth Observation data from Bhuvan, the geo-sensing platform of the National Remote Sensing Centre (NRSC), Indian Space Research Organisation (ISRO), is utilised to present the increases in key urban centres. Night light radiance is expressed in nanowatts per square centimetre per steradian ( $nW/cm^2/sr$ ) – broadly indicating the amount of light energy detected over a specific area and angle.







15.12. The images above illustrate the changes in NTL across eight major urban centres between 2012 and 2023. Red shading indicates major urban zones, commercial districts, and densely populated regions with considerable artificial lighting. Pale yellow marks semi-urban or peri-urban areas, while grey indicates small villages and less-populated suburban zones. Black areas represent rural regions with minimal artificial lighting. It is observed that older cities, such as Mumbai and Bangalore, exhibit smaller increases in highly dense regions but have expanded notably into semi-urban or peri-urban zones. Cities such as Pune and Hyderabad have experienced substantial growth in their densely populated areas, while also undergoing significant expansion into peri-urban regions. These observations are substantiated by the results of the Ministry of Housing and Urban Affairs (MoHUA) analysis on the dynamics of periphery-core growth. The periphery-to-core growth ratios provide deeper insights into how spatial expansion is distributed within metropolitan regions. In 16 cities<sup>7</sup>, the ratio exceeds one, indicating that peripheral areas have consistently grown faster than the urban core between 2000 and 2020. This confirms that India's metropolitan expansion is overwhelmingly outward, with new growth increasingly concentrated in urban fringes beyond municipal boundaries. Debroy & Misra (2024)<sup>8</sup> confirm this using novel high-frequency data. They find that across Mumbai, Chennai, Delhi, and Kolkata, urban growth is closely aligned with transport corridors and is accompanied by rapid conversion of agricultural land to non-agricultural uses. These patterns highlight the growing importance of suburban regions in shaping urban labour markets, housing demand, and infrastructure needs.

15.13. India's urban development will increasingly rely on planning approaches that recognise the growing scale and diversity of metropolitan regions. Strengthening spatial monitoring systems, adopting harmonised classification tools and integrating core-periphery analyses can support data-driven decision-making. As peri-urban belts

7 The cities covered in the analysis are Delhi, Kolkata, Bangalore, Ahmedabad, Jaipur, Chennai, Patna, Pune, Mumbai, Lucknow, Vadodara, Kanpur, Surat, Indore, Nagpur, and Bhopal

8 Debroy, B., & Misra, D. P. (2024). Tales of a few cities! (EAC-PM Working Paper No. EAC-PM/WP/36/2024). Economic Advisory Council to the Prime Minister.

emerge as important nodes of residential, industrial, and logistics activity, planning frameworks will benefit from a broader metropolitan and regional perspective, especially in areas where economic and mobility linkages extend beyond statutory boundaries.

### **Box XV.1: Rethinking urbanisation in India using spatial classification: evidence from Kerala<sup>9</sup>**

Building on the evidence of extensive peripheral growth and the limitations of administrative boundaries in capturing emerging settlement patterns, this section adopts a spatially harmonised approach to measuring urbanisation. Kerala offers a compelling case to demonstrate how such methods can reveal the true extent and morphology of urban growth.

#### **Spatial Approach and Methodological Framework**

Kerala provides an illustrative case, particularly in contexts where settlement patterns are highly dispersed and administrative boundaries do not fully capture the extent of built-up and economically integrated areas. To examine these dynamics, this section employs the Global Human Settlement – Degree of Urbanisation (GHS-SMOD/DEGURBA) classification for 2010, 2020, and 2025, a globally standardised methodology that enables consistent identification of rural and urban settlements on a fine spatial scale (Dijkstra et al., 2021). The analysis begins by mapping population-density grids in Kerala at the 1 sq.km level and classifying them into Urban Centres ( $\geq 1,500$  persons/km<sup>2</sup> &  $\geq 50,000$  people), Urban Clusters ( $\geq 300$  persons/km<sup>2</sup> &  $\geq 5,000$  people), and Rural Areas based on harmonised criteria. These classifications are then overlaid on 1,555 spatial units (villages, census towns, statutory towns), using the census boundary dataset, to assess the extent to which individual units meet thresholds for being designated as New Urban Centres or New Urbanising Settlements. A rule-based approach is used in which a settlement is categorised as a New Urban Centre if at least 70 per cent of its area falls within Urban Centre grids, and as a New Urbanising Settlement if 70 per cent or more of its area lies within Urban Cluster grids or a combination of Urban Centre and Urban Cluster grids.

A crucial aspect of the analysis is accounting for Kerala's institutional changes since the 2011 Census, including the creation of 34 new urban local bodies, expansion of municipal boundaries, and consolidation of census towns and villages into statutory towns. Including these updates ensures that spatial classification accurately reflects current governance and identifies settlements with urban traits that extend beyond statutory limits. This combined approach offers a comprehensive view of Kerala's evolving urban landscape and complements existing measures.

#### **Spatial Transformation of Kerala's Settlement Structure (2010–2025)**

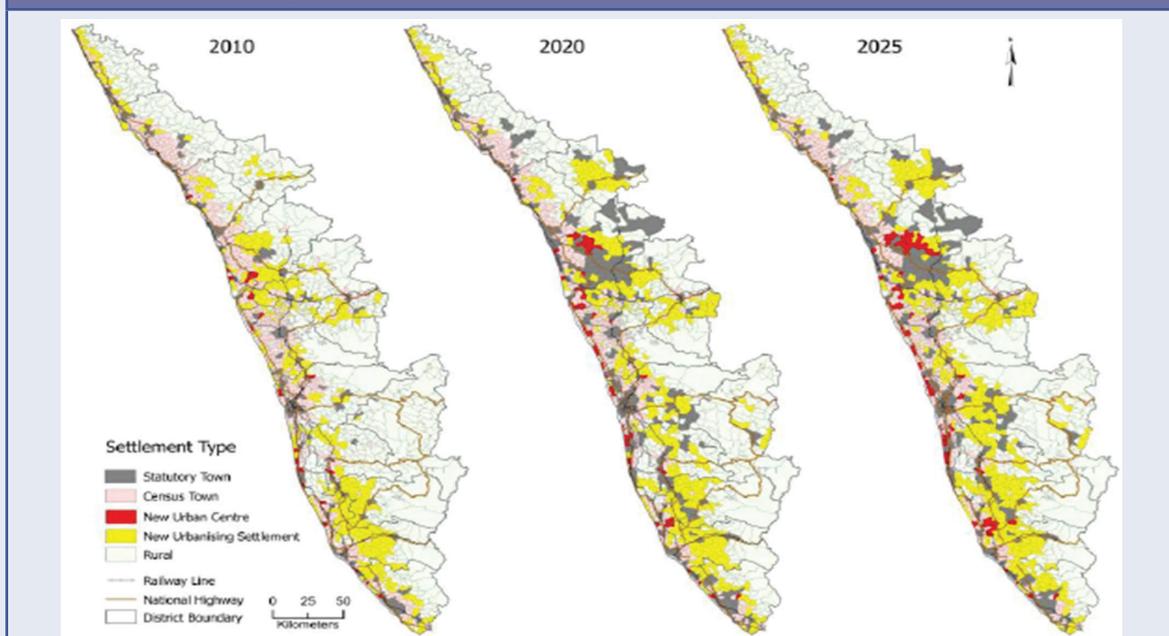
The spatial classification reveals that Kerala's settlement structure has undergone significant changes over the last decade, highlighting the expansion of urban areas. In 2010, the DEGURBA framework identified 420 settlements, including 29 New Urban Centres and 391 New Urbanising Settlements, which collectively housed approximately 8.2 million people. When combined with statutory towns, Kerala's urban population increased from 47.7 per cent (2011 Census) to around 72.2 per cent, revealing many functionally urban areas.

<sup>9</sup> Based on inputs from MoHUA

By 2020, the number of spatially identified urban-type settlements increases to 484, including 48 New Urban Centres and 436 New Urbanising Settlements, accommodating around 9.02 million people. Considering the creation of 34 new urban local bodies, expansion of existing municipal boundaries, and several post-2011 reclassifications, Kerala's updated statutory urbanisation level is revised at 53.81 per cent. When the spatially identified settlements are added, the estimated urbanisation increases to about 80.8 per cent, reflecting the widespread expansion of built-up and integration of economic areas beyond traditional municipal limits.

Estimates for 2025 indicate a further increase to 526 spatially identified urban-type settlements—65 New Urban Centres and 461 New Urbanising Settlements—housing approximately 9.63 million people. This raises the urbanisation estimate to 82.6 per cent, a level broadly aligned with long-term demographic projections for the state. Complementary built-up analysis across major cities reinforces these findings. Between 2010 and 2025, the built-up area expanded by 11.4 per cent in Kochi, 17.6 per cent in Thiruvananthapuram, 17.5 per cent in Kannur, and 19.6 per cent in Thrissur. Periphery-to-core growth ratios reached as high as 5.9 in Kannur and 5.2 in Kochi, indicating that much of the spatial expansion is occurring in peripheral areas even after recent adjustments to municipal boundaries.

**Chart XV.7: Spatial transformation of Kerala's settlement structure**



Source: MoHUA

Kerala's urbanisation features numerous dispersed settlements with urban functions, many outside town boundaries. Spatial analysis offers insight into growth beyond administrative boundaries, revealing evolving settlement patterns and extensive built-up, integrated areas.

### Spatial insights from Kerala's urban transition

i. **Recognising functionally urban settlements:** The spatial analysis reveals many

settlements in Kerala outside municipal limits that show urban traits. These Urban Centres and Urbanising Settlements serve large populations and play key economic and social roles. This indicates dispersed urban growth, forming a ribbon-like urban conurbation.

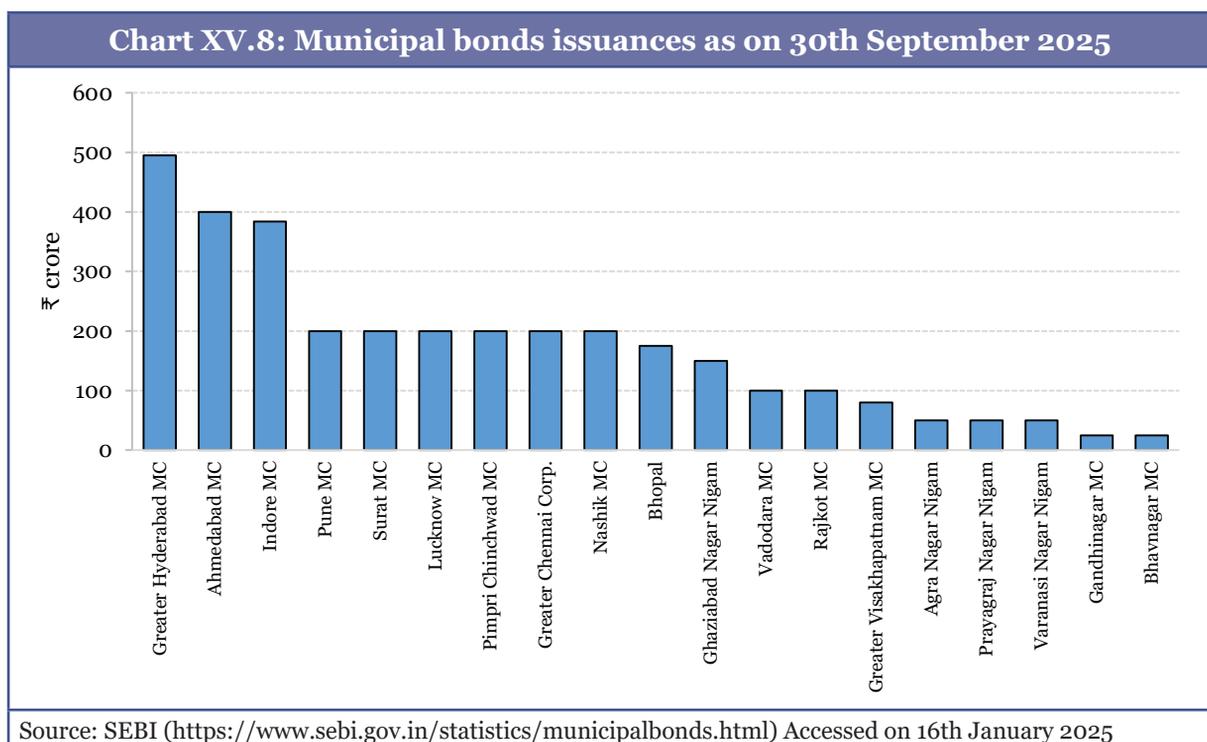
- ii. **Strengthening peri-urban and regional planning approaches:** Urban expansion in Kerala is now centred in peri-urban and corridor areas outside city boundaries. This pattern requires planning approaches that extend beyond city limits and manage growth at a regional scale. Tools such as GIS-based master plans, multimodal mobility frameworks, and designated Special Planning Zones can help guide development in these fast-transforming areas and ensure coordinated, sustainable expansion.
- iii. **Supporting strategic regional nodes:** The distribution of emerging urban settlements reveals several regional growth nodes across Kerala, including medium-sized towns and peri-urban clusters like Ernakulam–Aluva–Kakkanad, Malappuram–Perinthalmanna corridor, and parts of Thrissur. These serve as key components of the urban system, highlighting the growing importance of secondary and intermediate settlements in the evolving landscape.
- iv. **Governance systems and boundary considerations:** The expansion of built-up areas and the growth of Census Towns and transitional settlements illustrate the evolving relationship between statutory boundaries and actual settlement patterns. These spatial changes highlight the dynamic interactions between the types of settlements, administrative structures, and functional urban areas. Strengthening the institutional capacity of new or expanded urban bodies remains relevant for understanding how governance systems adapt to these transitions.
- v. **Financing transitional areas and enhancing spatial monitoring:** Many transitional areas face challenges due to their position between rural and urban administrative systems. These areas often experience changing land use patterns and infrastructure pressures. Institutionalising spatial tools like DEGURBA as complementary monitoring instruments can enhance the ability to track settlement transitions, support evidence-based planning, and guide the interpretation of evolving urbanisation patterns.

## GOVERNANCE DEFICIT: WHEN CITIES LACK ECONOMIC AGENCY

15.14. One of the central structural constraints is the institutional design of Indian cities. Unlike global cities that operate with significant administrative and fiscal autonomy, Indian cities remain embedded within multi-layered governance structures. Urban functions are fragmented across: Urban Local Bodies (ULBs), Development Authorities, State line departments and Parastatal agencies

15.15. While ULBs play an important formal role, many key functions—such as land use, policing, utilities, and cadre management—continue to be exercised at the state level. This creates a governance architecture in which strategic coordination across transport, land, housing and economic development is shaped largely beyond the municipal tier. Mayoral leadership and municipal accountability, therefore, operate within a system where authority is shared across multiple levels.

15.16. In India, there is an inherent contradiction in urban policy and expected outcomes. Cities are expected to deliver growth, productivity, and jobs, yet policy is designed to restrain density, fragment authority, and ration urban land. Indian urban policy often reverses this logic. The result is not chaotic cities, but rather cities that fail to achieve the expected outcomes due to interconnections and integration. Metro rail, flyovers, and expressways are built without parallel land-use reform, housing supply, or skill clustering. Transport systems are asked to compensate for planning failures rather than enable density. The result is capital-intensive infrastructure with sub-optimal economic returns. Metro systems move people, but they do not always raise productivity because jobs, housing, and transport remain misaligned. Infrastructure without institutional reform is concrete without consequence.



15.17. Global cities invert this. Electoral, planning and financial accountability are mostly aligned. Mayors or city governments are directly elected, like in India, but are also empowered to make city-planning and financial decisions, control land-use and transport planning through unified metropolitan plans, and command meaningful own-source revenues or predictable fiscal transfers. Hence, there is room for improvement in accountability. For e.g. in certain economically important cities in the United States, the Mayor's Office oversees citywide planning, capital budgeting, and service delivery, funded by strong local taxation powers. Indian cities raise less than 0.6 per cent of GDP in own-source revenues, borrow negligibly, and depend overwhelmingly on intergovernmental transfers. The World Bank Report on 'Financing Urban Infrastructure' quotes (Kelly, 2020) to say that Urban property tax is the largest

OSR (Own Source Revenue) but remains minuscule relative to comparators, being only 0.15 per cent of GDP in aggregate nationwide, compared to 0.3–0.6 per cent of GDP for low- and middle-income countries on average. For most large Indian cities, OSR covers only 30–40 per cent of total municipal expenditure, falling to below 20 per cent for smaller cities. Comparatively, OSR for OECD cities is roughly 2–4 per cent of GDP, with property tax alone ranging between 1 per cent and 1.5 per cent, increasing to 3 per cent in some US cities.

15.18. Despite their limited economic independence, cities contribute disproportionately to economic growth. World Bank estimates that by 2036, India's towns and cities will be home to 600 million people, or 40 per cent of the population, up from 31 per cent in 2011, with urban areas contributing almost 70 per cent to GDP. Comparison<sup>10</sup> of GDP/Population ratio of large cities in India, China, the US and Germany (2023) found that the top-10 cities account for only ~9 per cent of the population but nearly 28 per cent of GDP, a ratio of ~3×—far higher than the US (~1.5×), Germany (~1.5×), or China (~1.8×). Given their significant contribution, any infrastructure breakdown here would have disproportionate effects on national growth.

15.19. Hence, cities become economically central. However, they remain politically peripheral. Electoral, fiscal, and administrative responsibilities remain distributed across multiple tiers of government. This institutional structure can constrain the ability of city governments to mobilise revenues, coordinate planning, and take long-term investment decisions at the metropolitan scale. This limits political ownership of urban outcomes and reduces incentives for deep institutional reform. The result is a model in which cities function primarily as implementation units rather than autonomous economic actors. Global cities compete; Indian cities comply.

15.20. There is a case made for aligning authority and accountability, because even as Indian cities are administered, global cities are governed. Administration disperses power to avoid blame. Governance concentrates it to enable action and accountability.

## LAND, HOUSING, MOBILITY, AND SANITATION AND WASTE MANAGEMENT – THE BINDING CONSTRAINTS

### Land as dead capital

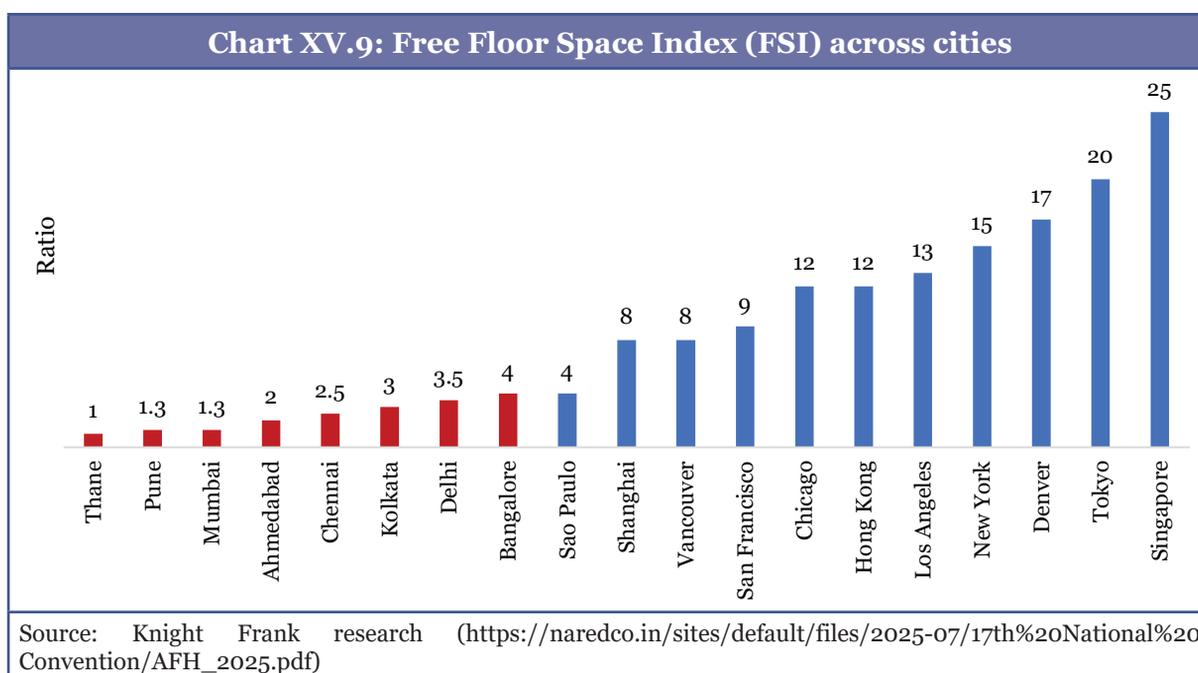
15.21. In economic parlance, dead capital refers to assets that are unable to function as productive capital. These resources are unable to contribute to economic activity due to being constrained by regulatory, legal, or market inefficiencies. In many of our cities, land has effectively become dead capital due to a combination of restrictive land-use

<sup>10</sup> Neuralcity.in, an Indian civic data and AI startup - <https://tinyurl.com/4bswr2j4>

regulations, title insecurity, and fragmented markets, as well as speculative incentives that lead to low land recycling.

15.22. Restrictive land-use regulations in the form of Development Control Regulations (DCR), such as low floor space index (FSI) or floor-area ratio (FAR), place a cap on the amount of built-up area per unit of land, constraining vertical development and forcing spatial expansion outward rather than upward. This distortion raises land values and creates artificial scarcity in core urban areas. Compared to global cities like New York and Hong Kong, India's cities have relatively lower FSI, with exceptions for denser areas such as central business districts. When the FSI is low, settlements are incentivised to expand horizontally, driving up average land cost and increasing infrastructure delivery costs per unit of housing or commercial space. This limits housing supply and raises prices relative to incomes.

15.23. Many state governments and urban bodies are addressing and modifying DCRs and granting additional FSI for a premium on a piecemeal basis. However, a holistic rethink will be required for meaningful change at scale. For example, the Chennai Metropolitan Development Authority (CMDA), in drafting its third master plan, is reportedly considering a higher FSI in key zones, mixed-use development, and phased upgrades to support compact and vertical growth across the city<sup>11</sup>. Urban bodies and state governments can leverage MoHUA's resources, such as the guidance document on preparing transit-oriented development (TOD) plans<sup>12</sup>, in optimising city densities.



<sup>11</sup> <https://infra.economictimes.indiatimes.com/news/urban-infrastructure/chennais-third-master-plan-to-drive-vertical-growth-housing-and-civic-upgrades/122634699>

<sup>12</sup> <https://mohua.gov.in/upload/uploadfiles/files/TOD-Guidance-Document.pdf>

15.24. Another reason why land remains unproductive is unclear land titles, compounded by fragmentation and opaque records. Secure, transferable property rights are essential for land to function as capital. They allow land to be used as collateral, traded in formal markets, and redeveloped efficiently. Land tenure and security encompass securing and transferring rights related to land and natural resources. This includes titling, resolving land disputes, land acquisition, and managing informal settlements. The central government has undertaken multiple initiatives to address these obstacles. Under the aegis of the Digital India Land Records Modernisation Programme (DILRMP), the government introduced the Unique Land Parcel Identification Number (ULPIN or Bhu-Aadhaar, as well as the National Generic Document Registration System (NGDRS). State governments have also introduced digital systems to address these issues. These include, inter alia, the Telangana government's single digital platform, where the revenue, stamps, and registration departments are integrated with the Bhu Bharati portal<sup>13</sup>, and the Karnataka government's transition towards issuing digital land records under its ambitious Bhu Suraksha scheme<sup>14</sup>.

15.25. It is important to note that while increasing FSI and FAR may unlock economic value in terms of more built-up area per unit of land, the consequent rise in density will result in unproductive outcomes if augmenting infrastructure is not in place. As some analysts note<sup>15</sup>, the focus on “de-congestion” can mislead planners into spreading cities outward rather than building infrastructure to support compact growth, even though successful global cities are dense by design and pair density with robust services. Amenities such as mass transit, water, and sanitation, among others, must be key factors in the decision-making process. In the absence of adequate amenities, a rise in density will result in traffic gridlocks, water shortages and overwhelmed sanitation systems.

## Mobility

15.26. Cities are complex, living entities with their own systems, identities, cultures, and challenges. Transportation functions as their bloodstream, spine, and muscles, facilitating the flow of people, goods, and ideas, establishing structure, and supporting productive activity. When transportation systems are inadequate, the city's vitality diminishes—congestion, pollution, noise, and reduced productivity emerge as symptoms of decline.

15.27. There are several varying estimates of the loss in productivity across cities resulting from traffic congestion. A Centre for Science and Environment (CSE) report<sup>16</sup> on Delhi's congestion troubles states that an unskilled worker stands to lose between ₹7,200 - ₹19,600 per year due to congestion. Similarly, skilled and highly skilled workers

13 <https://tinyurl.com/ye9r85bt>

14 <https://tinyurl.com/2c2dct8t>

15 <https://tinyurl.com/4de9uxbp>

16 <https://www.cseindia.org/content/downloadreports/12612>

can lose as much as ₹8,300 - ₹23,800 and ₹9,000 - ₹25,900 a year, respectively. A working paper by the Institute for Social and Economic Change (ISEC)<sup>17</sup> estimated the loss of productive hours due to the late arrivals caused by traffic congestion would be around 7.07 lakh hours in 2018 for Bengaluru city, translating to a monetary cost of around ₹11.7 billion. A 2018 report by Uber–BCG estimated that costs associated with traffic congestion in the four metros of Delhi, Mumbai, Bengaluru, and Kolkata were USD 22 billion per year<sup>18</sup>. According to the TomTom Traffic Index 2024, commuters in Bengaluru, Mumbai, and New Delhi lost 117 hours, 103 hours, and 76 hours, respectively, per year due to rush-hour traffic in their respective city centres<sup>19</sup>. Despite the variation in estimates, it is evident that the costs of mobility issues are high and on the rise.

15.28. Effective treatment begins with identifying the underlying issue—a growing dependence on private vehicles. The vital signs of our cities are poor because roads are used more as storage for vehicles rather than corridors for people. Streets become congested not because citizens are moving excessively, but because cars carry too few passengers. Our roads have been utilised as storage for low-occupancy vehicles instead of facilitating movement for people. This diagnosis leads to the guiding principle: design cities to prioritise the movement of people, not vehicles. As the National Urban Transport Policy (2014) emphasises in its vision, we must “recognise that people occupy centre stage in our cities, and all plans should aim for their common benefit and well-being.” Solving for moving the most people requires prioritising modes with the greatest carrying capacity, across short and long distances.

**Chart XV.10: Corridor capacity of different modes of transportation (people/hr on a 3.5-mile-wide lane).**

							
A)	 2 000	 9 000	 14 000	 17 000	 19 000	 22 000	 80 000
B) MJ/p-km	1.65-2.45	0.32-0.91*	0.1	0.24*	0.2	0.53-0.65	0.15-0.35
C) € p-km infrastructure	2 500-5 000	200-500	50-150	600-500	50-150	2 500-7 000	15 000-60 000
D) Fuel	Fossil	Fossil	Food	Fossil	Food	Electricity	Electricity

Source: Global Energy Assessment - Toward a Sustainable Future. Chapter 9 - Energy End-Use: Transport; modified from Breithaupt, 2010

17 <https://www.isec.ac.in/wp-content/uploads/2023/09/WP-554-Vijayalakshmi-and-Krishna-Raj-Final.pdf>

18 <https://tinyurl.com/3e8uurx6>

19 <https://www.tomtom.com/traffic-index/ranking/?population=MEGA&country=IN>

15.29. Operationally, this principle requires high-capacity public transport as the backbone; safe, reliable first and last-mile access through walking, cycling, and shared feeders; and demand-based parking and transit-oriented development to reallocate scarce urban space from storage to movement. Where these conditions hold, private vehicles revert to an option, not a compulsion. It should be possible, safe, comfortable and desirable for any citizen to get around the city in a reasonable timeframe without needing a private vehicle. While private vehicles have their advantages, the problem arises when they become a necessity rather than one choice among several other viable options. A lack of viable alternatives to private vehicle use leads to congestion and its resulting ills, as citizens compete for limited road space using geometrically inefficient transport modes.

15.30. India has materially expanded mass rapid transit over the last decade. As of 2025, ~1,036 km of Metro/RRTS are operational across around 24 cities, with further corridors under construction.<sup>20</sup> The first Delhi–Ghaziabad–Meerut Namo Bharat RRTS corridor has ~55 km in service and is progressing towards full commissioning of around 82 km through phased openings and multimodal integration at hubs such as Anand Vihar. Box XV.2 explores the accomplishments of the RRTS. These systems are being delivered under the Metro Rail Policy (2017), which requires Comprehensive Mobility Plans, UMTA arrangements, and viability thresholds, and the National Transit-Oriented Development (TOD) Policy (2017), which encourages compact, mixed-use growth, multimodal integration, and value-capture financing around stations.

#### **Box XV.2: India's first Namo Bharat Regional Rapid Transit System (RRTS) – A network of networks**

The Delhi–Meerut Namo Bharat Regional Rapid Transit System (RRTS) represents a structural shift in India's approach to regional urban mobility, positioning high-speed commuter rail as economic infrastructure rather than a transport add-on. Spanning 82 km and designed for speeds up to 180 kmph, the corridor reduces Delhi–Meerut travel times to under one hour, compared to 1.5–2 hours by road. The project's financing structure—20 per cent each from the Centre and participating states, and 60 per cent from ADB, AIIB and NDB—demonstrates a scalable template for leveraging public capital to crowd in development finance for urban-regional connectivity.

The Namo Bharat RRTS has enabled NCR-wide integration across future corridors at Sarai Kale Khan, providing seamless interchange with the metro rail, Indian Railways, buses, and paratransit services. A notable innovation is the use of RRTS infrastructure for the Meerut Metro, resulting in a capital cost savings of approximately ₹6,300 crore. This integrated design enhances system viability, improves last-mile access, and highlights how shared infrastructure can increase returns on urban transport investments.

<sup>20</sup> [https://sansad.in/getFile/annex/268/AS114\\_p42gTo.pdf?source=pqars](https://sansad.in/getFile/annex/268/AS114_p42gTo.pdf?source=pqars)

The corridor has been integrated into India's first statutory implementation of Transit-Oriented Development (TOD). Master plans for Meerut and Ghaziabad have notified TOD zones, with large greenfield townships—New Meerut (350 hectares) and Harnandipuram/New Ghaziabad (541 hectares)—planned around RRTS stations. By enabling higher density, mixed-use, and employment decentralisation along the corridor, the project supports polycentric regional growth and relieves pressure on Delhi's core, converting mobility investment into a spatial productivity dividend.

The Namo Bharat RRTS also delivers substantial labour-market and inclusion benefits. Construction generated roughly 166 lakh mandays between 2019 and 2025, while operations are expected to support around 12 lakh mandays annually. Early accessibility estimates suggest large gains in jobs reachable within one hour—nearly 6.9–7.6 lakh for Meerut and about one lakh for Sarai Kale Khan—expanding effective labour markets across the region. Women's participation has been deliberately mainstreamed, with over 35 per cent of train operators and station controllers drawn from nearby towns and villages, alongside broader community skill-building initiatives.

The project illustrates how regional rail can advance India's climate, digital, and institutional objectives simultaneously. Since partial operations began, an estimated 25 lakh vehicle trips have been avoided, offsetting around 69 lakh kg of CO<sub>2</sub>, with a roadmap to source 60 per cent of energy from renewables. In-house digital systems for project management, asset maintenance, and training have improved delivery efficiency and created replicable institutional capacity. Looking ahead, the identification of nearly 2,900 km of potential Namo Bharat RRTS corridors across regional clusters such as Bengaluru–Mysuru–Tumakuru–Hosur, Chennai–Vellore–Villupuram–Chengalpattu and Hyderabad–Warangal, amongst others, suggests that, with a modest and predictable central outlay, this model could unlock high economic multipliers and support the emergence of India's mega-regions as engines of growth.

15.31. Complementing rail, the Government has launched PM e Bus Sewa to strengthen city bus operations with 10,000 e buses on a Public-Private Partnership (PPP) model, backed by ₹20,000 crore central assistance and a Payment Security Mechanism (PSM) to assure operator cashflows. Official status notes<sup>21</sup> for FY25 report 7,293 e-buses approved across 14 States and 4 UTs, ₹983.75 crore sanctioned for depot and behind-the-meter power infrastructure, and ₹437.5 crore already disbursed.

15.32. Despite these measures, gaps in mass transit services persist. City-level indicators reveal a capacity shortfall in buses. MoHUA recommends 40-60 buses per 1,00,000 people. Yet, many cities have far fewer. Nationally, only about 47,650 buses serve its urban residents<sup>22</sup>. Nearly 61% of these are concentrated in just nine megacities. Due to the layout of urban roads, low bus availability combined with high private vehicle use reduces person throughput per lane kilometre, leading to congestion and longer door-to-door travel times.

21 <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2102861&reg=3&lang=2>

22 <https://tinyurl.com/3fpnmm72>

15.33. Door-to-door performance also depends on first–last mile access to stations. National consultations and field evidence indicate that, where safe and convenient first- and last–mile options are lacking, rail systems underperform against ridership projections, despite high in-vehicle speeds. Cities are increasingly responding by integrating feeder services and publishing open transit data; without this, travel time reliability and perceived convenience remain below potential.

15.34. To further improve outcomes, the following measures may be useful:

- a. **Augment and digitise bus fleets:** Scaling city bus fleets toward 40–60 buses per lakh population can significantly increase person throughput on existing corridors at relatively low capital cost. Coupling fleet expansion with end-to-end digital systems improves reliability, reduces waiting times, and stabilises ridership and farebox revenues.
- b. **Finance-first e-bus deployment:** A Green Mobility Credit Facility—combining interest subvention (to ~3–4 per cent), credit guarantees, and refinancing—can lower tariffs on gross cost contracts and improve project bankability. Such finance-led approaches reduce EMIs and accelerate e-bus adoption without relying on large upfront capital subsidies.
- c. **Mainstream last-mile and shared mobility:** Legalising and standardising shared feeders (share autos, e-rickshaws, minibuses, bike taxis) through simple permits, station pickup bays, and app integration can deliver rapid door-to-door gains. Open, zero-commission platforms—linked to ONDC—enable transparent pricing, lower cancellations, and better access for women and off-peak workers.
- d. **Operationalise Transit-oriented Development (TOD) and value capture around stations:** Implementing the National TOD Policy via 500–800 metre station influence zones, higher FAR, mixed-use zoning, and value-capture tools can shorten trip lengths and cluster jobs near transit. Revenues from value capture can fund first–last mile connectivity and public-realm upgrades, strengthening network viability and compact growth.
- e. **Manage demand where geometry is most binding:** Targeted congestion pricing in dense business districts (Box XV.3), combined with demand-based parking management, can reduce traffic, raise speeds, and cut emissions, as seen internationally. Recent reforms, such as the Chennai Metropolitan Area Parking Policy (2025)<sup>23</sup> whereby private vehicle use is disincentivised, treats parking as valuable real estate, and prioritises walking, cycling, and public transport, shows that such demand-management tools are feasible complements to transit investment.

<sup>23</sup> <https://tinyurl.com/3b2xexky>

### Box XV.3: International experiences and learnings from congestion pricing

Congestion pricing is a transportation demand-management strategy in which drivers are charged a fee for using roads during peak periods of congestion. Limited road space leads to slower speeds, higher delays, and increased externalities when overutilized. The core idea is to internalise the external costs of congestion, such as delays, pollution, and fuel waste, ensuring that those who use the most congested roads bear the actual cost of their travel.

This, in turn, aims to reduce the number of private vehicles during peak congestion time on the specific congested corridors, improve travel speeds, and encourage public transport, carpooling, off-peak travel.

In a congestion pricing system, drivers are charged based on the following factors: location, time (peak vs off-peak), demand level (dynamic pricing), and vehicle type (cars, taxis, trucks, etc.) Payments are typically made via automatic number plate recognition (ANPR), RFID tags or GPS-based charging. Singapore and London stand out as examples of cities that have successfully implemented congestion pricing systems.

#### Singapore Electronic Road Pricing (ERP)

ERP is a dynamic, electronic, congestion-pricing system that automatically charges vehicles when they pass under a toll gantry during peak periods. It is specifically designed to manage and reduce traffic congestion, and decades of data from Singapore show that it works very effectively. It also works when observed speeds fall below the target thresholds, ERP charges are increased, and when speeds rise above them, charges are reduced. In the Previous ERP system, gantries were installed along key expressways, major arterial roads, and all entry points into the Central Business District (CBD). In contrast, ERP 2.0 extends congestion pricing beyond fixed gantry locations by enabling spatially dynamic, GPS-based 'pay-as-you-drive' charging.

The Area Licensing Scheme (ALS), introduced in 1975, reduced car entries into the CBD by about 45 per cent, and the subsequent implementation of ERP in 1998 achieved an additional 10-15 per cent reduction in traffic on expressways and arterial roads during charged periods.

The primary challenge was the public's resistance to monetising road usage, which many felt would unfairly favour the wealthy. The government addressed these equity concerns by pairing the pricing scheme with immediate "carrots," such as a comprehensive Park-and-Ride network and improved bus services. By continuously fine-tuning operational hours and fees based on real-time data, authorities successfully framed the policy as a mechanism for optimising traffic flow rather than generating revenue. (Lim, 2014)<sup>24</sup> (ITDP, 2016)<sup>25</sup>

#### London (Congestion Charge, 2003)

London's road network is old, narrow, and cannot be widened, so managing demand, not supplying new road space, became essential. The London Congestion Charge is a cordon-

<sup>24</sup> Lim, T. S. (2014, Aug 15). Area Licensing Scheme. Retrieved from National Library Board: <https://www.nlb.gov.sg/main/article-detail?cmsuuiid=072b1248-63b0-4b30-8a04-ba1742961351>

<sup>25</sup> ITDP. (2016, May 18). The Case for Electronic Road Pricing. Retrieved from Development Asia: <https://development.asia/case-study/case-electronic-road-pricing>

based, area licensing system where vehicles pay a daily fee to enter, leave, or move within a designated central London zone. The charging zones:

- Covers approx. 21 km<sup>2</sup> of Central London (e.g., Westminster, City of London)
- Boundary marked with signs but no physical barriers.
- Operates from Monday to Friday, 7:00 AM to 6:00 PM, with its hours expanded and modified over the years.
- Charges £15 per day (after subsequent revisions)
- Exemptions / Discounts (Buses and taxis, Emergency vehicles, Residents within the zone (90 per cent discount)

The impact on traffic was sudden and dramatic. According to Transport for London's own data (TfL, 2003)<sup>26</sup> traffic in the zone has decreased by 16 per cent (30 per cent for cars), while motorcycle, taxi, bus, and cycle traffic have increased. This translates into a 32 per cent reduction in congestion, measured in terms of delay per kilometre. Average traffic speeds have increased from 13 to 17 km/h. TfL (2003) estimates that the number of car trips into the zone has fallen by 150,000 per day, of which 10-20 per cent are displaced through trips, 50-70 per cent have shifted to public transport, and 20-30 per cent went elsewhere other modes, travelled at other times, or chose alternative destinations (TfL, 2003).

The implementation of the congestion charge was met with accusations that it was "Just Another Tax," with critics arguing that it was regressive and harmful to the retail sector. To counter this, the government adopted a strategy of revenue hypothecation, legally ring-fencing all proceeds for public transport investments. By starting with a modest £5 fee and visibly linking the charge to improved bus and underground services, the city demonstrated that the policy was a tool for service enhancement rather than a simple revenue grab. (Cani, 2023)<sup>27</sup> (Litman, 2005)<sup>28</sup>

## Urban cleanliness and waste management

15.35. Cleanliness and waste management in cities are critical aspects in India's urbanisation journey. They have direct implications for public health, environmental sustainability, labour productivity and the overall quality of urban life. Over the past decade, the central government has undertaken one of the most ambitious and largest sanitation and waste management programmes globally under the Swachh Bharat Mission -Urban (SBM-U), complemented by investments under the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and AMRUT 2.0. These measures have yielded visible gains in sanitation outcomes, with the most notable being the elimination of open defecation across all cities.

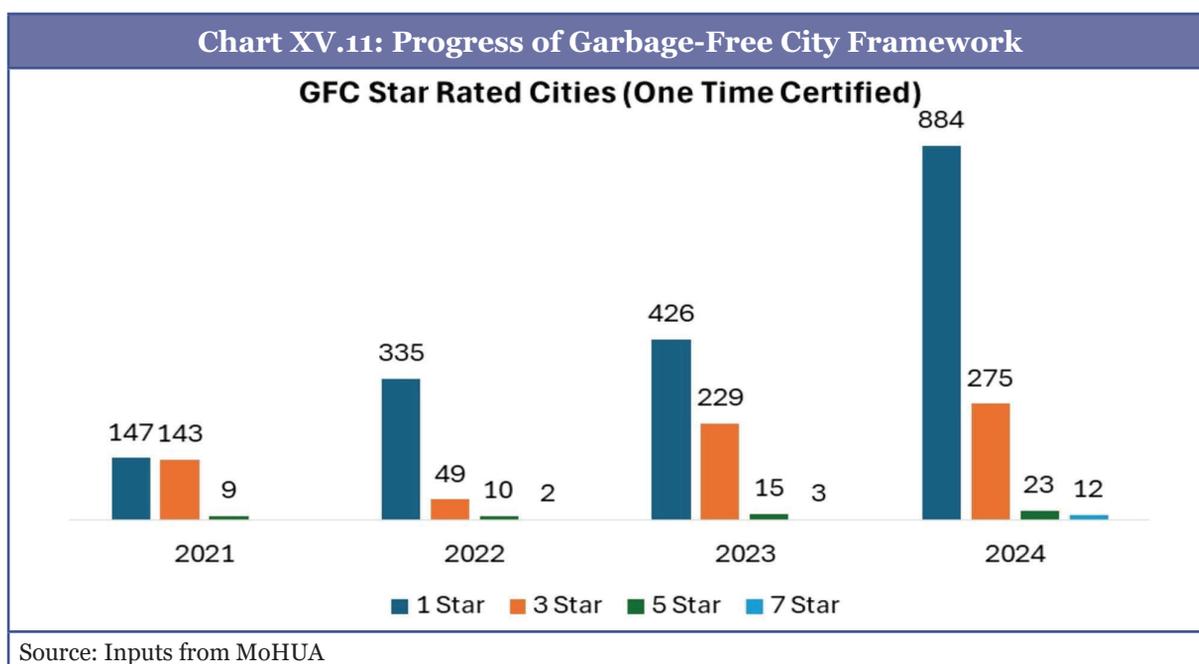
<sup>26</sup> (TfL), T. f. (2003). Congestion charging: six months on. Retrieved from <https://tfl.gov.uk/>

<sup>27</sup> Cani, R. d. (2023, March). Two decades in, what can other cities learn from the London congestion charge? Retrieved from Arup: <https://www.arup.com/insights/two-decades-in-what-can-other-cities-learn-from-the-london-congestion-charge/>

<sup>28</sup> Litman, T. (2005). London congestion pricing—implications for other cities. Victoria Transport Policy Institute

15.36. After the success of the first phase of SBM-U, SBM-U 2.0 was launched in October 2021, with the policy focus shifting from improving access to achieving better outcomes. Progress under SBM-U 2.0 has been significant but uneven. Door-to-door collection of municipal solid waste (MSW), which was negligible in 2014–15, has expanded to 98 per cent of urban wards by 2025–26, supported by a fleet of over 2.5 lakh waste collection vehicles nationwide. Many large cities now use GPS-enabled vehicles and Integrated Command and Control Centres (ICCCs) to monitor collection routes and improve operational efficiency. At the national level, urban India generates approximately 1.6 lakh tonnes of MSW per day, of which around 80 per cent is reported to be processed, compared to just 16 per cent in 2014–15. While this marks a substantial scaling up of waste management capacity, gaps in segregation quality, processing effectiveness, and enforcement persist at the local level.

15.37. Despite these measures, many cities continue to struggle to move beyond basic compliance. Under the Garbage-Free City framework, cities are evaluated against progressively stringent benchmarks and assigned ratings. The ratings range from 1 Star to 7-Star, linking door-to-door collection, segregation rates, waste processing, and legacy waste remediation. For instance, a 3-Star city must achieve at least 60 per cent segregation and 70 per cent processing, while a 7-Star city must reach 90 per cent segregation and processing, alongside near-complete remediation of legacy dumpsites. The assessment reveals that while there has been a rapid increase in the number of cities improving door-to-door collection, segregation at source, waste processing and dumpsite remediation lag behind. This suggests that urban cleanliness is no longer primarily an access issue, but rather an institutional and behavioural one.



15.38. This is corroborated by a study by the Council on Energy, Environment and

Water (CEEW) (Khan, Mishra & Singh, 2025)<sup>29</sup>. The study presents a challenge–root cause–solution (CRS) matrix based on a comprehensive literature review of solid waste management (SWM) challenges, semi-structured interviews with stakeholders, and observations and learnings from field visits, identifying 26 challenges prevalent across the SWM supply chain. Over half of the 97 determined root causes are linked to the challenges stemming from people's mindset and understanding, organisational rules and management, and physical facilities and systems.

15.39. How can the public's attitude towards waste management be changed? At the national level, MoHUA has identified Cleanliness Target Units (CTUs) as a key focus area under SBM-U 2.0. CTUs are difficult and dirty spots, including legacy waste dumpsites, that require urgent attention and transformation. From September 17, 2025, onwards, out of more than 16 lakh identified CTUs, 15.74 lakh CTUs have been transformed, with the participation of 7.75 crore citizens. While the figure is heartening, there needs to be a larger involvement of citizens in ensuring the cleanliness of our cities. In this context, Indore city serves as a good example of enhancing citizens' participation.

15.40. Indore, which ranked 25th in the 2016 round of the Swachh Survekshan Survey, has consistently ranked first since 2017. A key element in this turnaround was behavioural change at the mass level. The Indore Municipal Corporation (IMC) took several steps to raise awareness among the population and promote segregation. Garbage collection vehicles were repurposed as moving platforms for the “Do Bin Har Din” campaign, reinforcing segregation practices. Communication efforts combined traditional outreach, such as nukkad nataks, wall paintings, and radio jingles, with an intensive use of social media, ensuring broad and repeated messaging. Schools involved students in cleanliness competitions and oath-taking during morning assemblies, instilling segregation norms at an early stage. A buy-in by city-level leadership was key to the transformation, with the mayor and ward councillors actively participating in campaigns. Municipal officials and elected representatives conducted joint roadshows to persuade households and establishments to comply.

15.41. Religious and local leaders were mobilised to leverage the social influence of faith and community networks. By linking cleanliness to values articulated in religious texts and participating in collective road-sweeping drives, they helped promote waste segregation as a shared civic responsibility. The IMC also engaged over 800 self-help groups, comprising more than 8,000 women, both to spread awareness at the neighbourhood level and to staff material recovery facilities. This helped create livelihoods while also embedding a sense of community ownership. Incentives, such as awarding ‘zero-waste’ tags to markets and residential colonies that demonstrate

<sup>29</sup> Khan, Adeel, Srishti Mishra, and Priyanka Singh. 2025. Tailoring Solid Waste Management in India: Learnings from Cities with a Million-plus Population. New Delhi: Council on Energy, Environment and Water.

exemplary performance, encouraged peer competition. Penalties for littering and failure to segregate waste were strictly applied, supported by ward-level enforcement teams. The transformation of Indore city is evidence that instilling civic pride is one key lever in keeping our cities garbage-free. The role of citizens in building a Viksit Bharat by 2047 is outlined in Chapter XVI Part-2 (p.XX)

15.42. Our cities need to leverage other best practices in waste management. A report by Niti Aayog<sup>30</sup> captures some of these success stories from across the country, spanning domains such as material processing, biodegradable waste management, landfill management and technological innovation, among others. Additionally, local bodies should tailor their practices to manage city-specific challenges. (Khan, Mishra & Singh, 2025)<sup>31</sup> provide insights and case studies that can help municipal authorities adopt context-specific solutions to improve their waste management systems.

15.43. Higher density of cities also places pressure on sewage and water supply systems. India is the world's third-largest generator of wastewater, producing an estimated 112 billion litres per day of domestic and industrial effluent.<sup>32</sup> Urban areas, alone, account for two-thirds of this volume as domestic used water, yet only 28 per cent is treated. Furthermore, cities recycle only 8 per cent of this treated wastewater for reuse. MoHUA estimates that currently, a reuse capacity of 1,992 million litres per day (MLD) is planned to be developed through sewerage projects. Box X.4 explores tapping the potential of sustainable water management through a circular water economy.

#### **Box XV.4: Turning India's urban water stress into an opportunity using circular water economy<sup>33</sup>**

As freshwater scarcity in India's cities intensifies, a model of 'use and dispose' will no longer suffice as our cities expand. The reuse of treated used water (T UW) for non-potable purposes is the next frontier for sustainable water management in India's cities. It holds the power to reduce pressure on freshwater by diversifying water sources while creating large social and economic benefits.

The economic potential of circular water systems is substantial. Reuse of T UW for non-potable purposes, such as industrial cooling, construction and landscaping, could create a market of ₹2.4 – 3.2 lakh crore by 2047 and generate over 1 lakh employment opportunities<sup>34</sup>.

<sup>30</sup> <https://www.niti.gov.in/sites/default/files/2021-12/Waste-Wise-Cities.pdf>

<sup>31</sup> Khan, Adeel, Srishti Mishra, and Priyanka Singh. 2025. Tailoring Solid Waste Management in India: Learnings from Cities with a Million-plus Population. New Delhi: Council on Energy, Environment and Water.

<sup>32</sup> [https://aim.gov.in/images/Waste-Water-ver2\\_18102022.pdf](https://aim.gov.in/images/Waste-Water-ver2_18102022.pdf)

<sup>33</sup> Council on Energy, Environment and Water (CEEW), New Delhi based on: Iyer, Parameswaran, Arunabha Ghosh, and Richard Damania (In Press). Water, Nature, Progress. HarperCollins Publishing

<sup>34</sup> Gupta, Saiba, Ayushi Kashyap, Clark Kovacs, Kartikey Chaturvedi, and Nitin Bassi. 2025. Financing Treated Used Water Reuse in India. New Delhi: Council on Energy, Environment and Water.

Even with existing infrastructure, full utilisation of current treatment capacity could free up enough freshwater to irrigate nine times the area of Delhi, highlighting the scale of opportunity locked in underused assets.

However, most cities are not yet prepared to realise this potential. A CEEW assessment of 503 cities across 10 states finds that 82 per cent either do not reuse treated water or lack functioning treatment infrastructure. Outcomes remain constrained by fragmented planning, underinvestment in operations and maintenance, and weak reuse markets. Less than 27 per cent of households are connected to underground sewerage systems<sup>35</sup> which limits both treatment volumes and the viability of reuse networks.

The government has supported the circular water economy. The ‘Jal hi Amrit’ initiative was launched under AMRUT 2.0 by MoHUA to incentivise States & UTs to manage the used water (sewage) treatment plants efficiently for ensuring recyclable, good-quality treated water, meeting environmental standards, on a sustained basis. So far, 860 Sewage Treatment Plants (STPs) with a total treatment capacity of 17,613 MLD in 402 cities across 21 States and 4 UTs have been enrolled via the online platform, and their assessments have been submitted.

To further improve the circular economy, a phased and outcome-oriented approach to developing a circular water economy can be considered. This would involve progressively increasing wastewater treatment capacity while simultaneously expanding reuse, rather than positioning treatment and reuse as sequential or separate objectives. Such an approach would enable infrastructure, demand, and regulatory capacity to develop in tandem. Given its institutional footprint, MoHUA is well-placed to anchor the effort, in partnership with the National Mission for Clean Ganga (NMCG) and the National River Conservation Directorate (NRCD).

Financing and pricing arrangements will be key to ensuring the viability of a circular water economy. Calculations based on the most commonly used water treatment technologies suggest that to achieve 100 per cent sewage treatment, India would require capital investments of ₹1.5-2.3 lakh crore in technologies alone by 2047. Evidence from Indian cities indicates that long-term TOW offtake agreements, industrial buyers acting as anchors, hybrid annuity-style contracts, and municipal borrowing instruments can reduce revenue risk. Offering TOW to industrial and commercial units at discounted prices as compared to municipal freshwater can make the circular economy of used water financially attractive.

A circular water economy is a coherent option for cities to turn wastewater from a waste issue into a useful urban resource. This approach can play a critical role in enhancing water security, easing the demand on freshwater sources, and supporting the long-term economic and environmental health of India’s urban expansion.

<sup>35</sup> Jain, Anoop, Caleb Harrison, Akhil Kumar, Rockli Kim, and S. V. Subramanian. 2024. “Examining Geographic Variation in the Prevalence of Household Drainage Types across India in 2019-2021.” *Npj Clean Water* 7 (1). <https://doi.org/10.1038/s41545-024-00355-0>.

## City Upgradation through Technology Adoption

15.44. India's urban systems have undergone sustained transformation through national initiatives to upgrade infrastructure and services. Through a rigorous focus on upgrading the quality of urban living, India launched schemes such as AMRUT, Smart Cities and Swachh Bharat, addressing different aspects of urban cities.

15.45. The Smart Cities Mission (SCM), launched in June 2015, represents one of India's most ambitious efforts to modernise urban infrastructure and improve the quality of life across a range of municipal services. The Mission was designed to transform 100 select cities by strengthening core city infrastructure, promoting sustainable, citizen-focused services, and leveraging technology to improve service delivery. It has pursued both area-based development through focused investments in selected urban districts and pan-city solutions that deploy digital tools for water supply management, mobility, waste processing, public safety, and real-time municipal governance.

15.46. As of 9 May 2025, cities under the SCM had completed a substantial majority of planned projects — including smart roads, cycle tracks, command and control centres, upgraded water and sewerage networks, and vibrant public spaces — with over 90 per cent of the roughly 8,067 projects completed and nearly ₹1.64 lakh crore invested<sup>36</sup>. However, the impact of the scheme is in the expansiveness of infrastructure retrofits and upgradation of services in most of the cities. Today, all 100 Smart Cities have operational Integrated Command and Control Centres (ICCCs) that use data and digital platforms to monitor urban services. Many cities have adopted technology for water (SCADA) and waste monitoring and management (garbage collection) systems. Most cities are either planning or have already brought in Intelligent Transport Management Systems to improve traffic flows within the dense city centres and technology has also been used to improve accessibility to basic education and health needs.

## INFORMALITY AS AN URBAN OUTCOME – FROM ERADICATION TO INTEGRATION

15.47. Informality is one of the most persistent and visible features of urbanisation in India. It manifests across housing, labour markets and enterprises and shapes how cities grow. Conventional urban policy has often treated informality as a transient phenomenon that arises from planning and governance failures, and as something that must be eliminated as cities modernise. However, decades of experience in India and globally indicate that informality is not an aberration but a structural outcome of rapid urbanisation under constrained formal systems. Slums, informal work and unregistered enterprises absorb excess labour, provide low-cost housing near jobs, and serve urban consumption and production needs that formal systems often fail to meet.

<sup>36</sup> <https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=154736&ModuleId=3&reg=3&lang=2>

15.48. Informal housing and slums play a key role in facilitating geographical proximity between labour and the place of work. In the absence of affordable housing, informal settlements often cluster near residential areas, industrial zones, or commercial establishments, providing access to employment and services that would otherwise be inaccessible to low-income migrants and workers. In India's case, the shortage of affordable housing has increased sharply over the past decade. The report of the Technical Urban Group (TG-12) on Urban Housing Shortage 2012-17<sup>37</sup> estimated that across urban India, there was a deficiency of 18.8 million houses in 2012, with 15 million households living in congested houses that required new housing. An ICRIER working paper (Roy & ML, 2020)<sup>38</sup> estimates that this figure increased to 29 million in 2018 and finds that 99 per cent of the shortage was confined to low-income economic groups in 2018. More recently, a Knight Frank - NAREDCO report<sup>39</sup> projects that accounting for the existing shortage, the cumulative affordable housing demand in India by 2030 is estimated to be 30 million units. The report also finds that in India's top eight cities<sup>40</sup>, the supply of affordable housing (units costing less than ₹50 lakh) has declined from 52.4 per cent in 2018 to 17 per cent by 2025.

15.49. In many Indian cities, affordable housing increasingly appears in peripheral areas due to lower land costs and easier access to large plots. Developers often move projects to the outskirts to keep prices attractive for low and middle-income buyers, as land acquisition is simpler. However, these areas typically lack sufficient infrastructure, including poor connectivity to employment centres, inadequate mass transit systems and civic amenities. Consequently, while these locations offer affordable housing, they often fall short in essential urban services required for sustainable living. This creates a dilemma: despite higher demand driven by affordability, the lack of proper infrastructure hampers their liveability and long-term appeal.

15.50. The government has undertaken multiple interventions to support affordable housing in urban areas. These include direct tax and GST benefits, inclusion in priority-sector lending, which enables higher loan-to-value ratios and therefore smaller down payments, and provision of infrastructure status, amongst others. Under the two phases of the Pradhan Mantri Awas Yojana – Urban (PMAY-U), a total of 122.06 lakh houses have been sanctioned, of which 96.02 lakh have been completed/delivered to the beneficiaries across the country as on 24.11.2025.

15.51. The informal labour market is just as key to the urban economy. A substantial share of urban employment, including self-employment and casual wage work, is

37 <https://nbo.gov.in/pdf/urban-housing-shortage.pdf>

38 [https://icrier.org/pdf/Working\\_Paper\\_402.pdf](https://icrier.org/pdf/Working_Paper_402.pdf)

39 <https://content.knightfrank.com/research/3035/documents/en/india-affordable-housing-2025-12385.pdf>

40 These cities are Mumbai, Delhi, Ahmedabad, Pune, Hyderabad, Bengaluru, Kolkata and Chennai

informal, absorbing migrants and low-skilled workers who lack opportunities in the formal sector. Informal jobs, ranging from construction and domestic work to vending and micro-services, offer flexibility and immediate income opportunities in an environment where formal jobs are relatively scarce.

15.52. The mass departure of informal sanitation and domestic workers in Gurugram, Haryana, in mid-2025 vividly demonstrated the importance of the informal labour force to urban functioning. From across the city, it was documented<sup>41</sup> how door-to-door garbage collection systems, operated largely by Bengali-speaking migrant workers and other informal staff, collapsed almost overnight as workers left the city amid fears of law enforcement actions. This left streets and gated communities littered with uncollected waste and rising public health risks. In many neighbourhoods, residents were forced to organise their own waste pickup or hire ad-hoc vehicles in the absence of trained crews. What had been routine, invisible work suddenly became impossible to overlook, underscoring how the smooth functioning of urban systems depends on a labour force that has no formal visibility yet is structurally indispensable. The disruption extended beyond sanitation, with domestic helpers, cooks and other informal service providers also leaving, leading households to scramble for alternatives and pay sharply higher rates. This episode illustrated that informal labour is not a peripheral or expendable sector but a foundational component of everyday urban life, whose absence can quickly translate into deterioration of services and elevated transaction costs for residents and local governments alike. Policymakers will do well to recognise the importance of the informal urban workforce and institutionally support their integration into the formal economy as well as the socio-economic urban fabric.

15.53. In this context, the Pradhan Mantri Street Vendor's Atmanirbhar Nidhi (PM SVANidhi) has played a central role in restoring and strengthening the livelihoods of urban street vendors (SV). Apart from its emphasis on financial and digital transformation in urban SV, the scheme allows a Letter of Recommendation (LOR) to serve as valid identification for street vendors. This removes the need to rely on the lengthy and time-consuming surveys conducted by Urban Local Bodies (ULBs) for vendor identification. A national digital vendor database now supports better planning and monitoring, while the scheme's expansion to census towns, urban agglomerations and peri-urban areas ensures that vending communities across the broader urban region are included. With the objective of ensuring the hygiene and safety of street food, the FSSAI's training of street food vendors as part of its capacity-building initiatives has led to improved working conditions, cleaner vending environments, and more dignified livelihoods.

15.54. Urban informality also extends to enterprises. Small, unregistered, and often

---

<sup>41</sup> <https://tinyurl.com/mrx2defb>

home-based firms are embedded in urban supply chains and neighbourhood economies. They deliver essential goods and services at price points that formal firms often cannot match. Clusters of informal activity demonstrate significant economic output and employment intensity, despite operating outside formal regulatory frameworks. These enterprises are sensitive to high compliance costs, credit constraints, and land access barriers, highlighting how regulatory design affects urban economic structure.

15.55. Despite the importance of the informal sector to urban agglomerations, urban planning has frequently utilised traditional approaches to informal settlements; however, there is a growing shift toward more integrative and inclusive strategies. From an economic perspective, such policies disrupt embedded capital, such as location and networks. Integration and upgradation of informal settlements and activities can be achieved through infrastructure provision and tenure security. Similarly, recognising informal workers and enterprises through simplified registration access to social protection and improved working conditions can raise productivity without compromising on flexibility. Informality is likely to remain a defining feature of our cities as India continues to urbanise further. Therefore, it becomes imperative to acknowledge this feature as a response to opportunity amid constraints. This will allow policymakers to design interventions that protect economic value while enabling a more inclusive and resilient urban transition.

## **CIVIC ORDER WITHOUT A SOCIAL CONTRACT: THE INVISIBLE FAULT LINE IN INDIAN CITIES**

15.56. While shortcomings in urban experience are often attributed primarily to institutional capacity, the quality of everyday life is also shaped by the implicit social contract between citizens and urban institutions. The lived experience of Indian cities reflects not only gaps in infrastructure, but also the credibility of rules, the predictability of services, and the trust that underpins everyday cooperation. The difference between global and Indian cities is therefore less about engineering alone and more about whether institutions make cooperation rational and worthwhile.

15.57. Programmes such as Swachh Bharat sought to combine investments in sanitation infrastructure with large-scale behaviour change efforts<sup>42</sup>. Through sustained communication<sup>43</sup>, funding support and public participation, as well as cleanliness and public hygiene, were brought into mainstream policy discourse. Many states introduced bans on spitting<sup>44,45</sup>, and littering, notified spot fines under Solid Waste Management by-laws, and strengthened environmental enforcement. Yet outcomes

<sup>42</sup> <https://sbmurban.org/behavior-change-interventions>

<sup>43</sup> <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1821417&reg=3&lang=2>

<sup>44</sup> <https://tinyurl.com/nkhp6w>

<sup>45</sup> <https://tinyurl.com/9frhv2a5>

remain uneven across cities and neighbourhoods. This is not primarily a problem of awareness or values, but of a fragile social contract. Where enforcement is inconsistent, service delivery unreliable, and penalties uncertain, compliance becomes contingent. When rules are applied unevenly, cooperation gives way to individual calculation. A striking contrast is visible between private and public spaces. Indian households invest heavily in maintaining their homes, while common spaces often receive far less care. This gap reflects the quality of the social contract. Where services are predictable and responsive, taxes and rules are seen as part of a shared system; where they are not, civic engagement weakens. People protect private property meticulously but hesitate to invest effort in common assets when there is limited confidence that collective restraint will be matched by collective benefit.

15.58. This helps explain why large investments in urban infrastructure have not always translated into commensurate improvements in everyday urban experience. ‘India Today’, in a unique country’s first civic survey, focused on ‘Gross Domestic Behaviour’<sup>46</sup>. The survey that explored India’s Civic Behaviour, Public Safety, Gender Attitudes, Diversity & Discrimination across 20 States and 2 UTs. The contradictory individual approach to morality and action is reflected in their analysis<sup>47</sup>: “Civic Behaviour (within the citizens) reflects a blend of contradictions, where individuals acknowledge the importance of public responsibility but often struggle to uphold those values when faced with personal gain or convenience.” The pattern is not one of simple neglect, but of a weak and uneven social contract: individuals are willing to cooperate when institutions are reliable, and withdraw when they are not. Civic order is therefore best understood as an institutional equilibrium rather than a cultural trait.

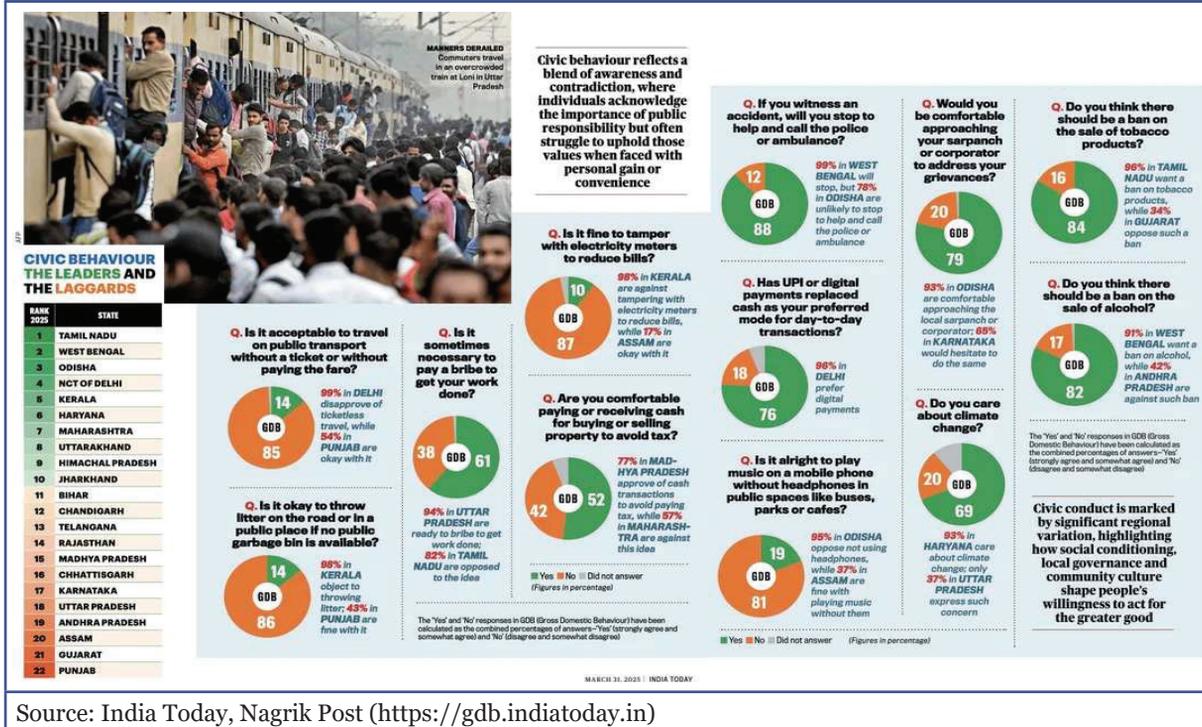
15.59. Global cities institutionalise cooperation through design, certainty and credible enforcement. In Singapore, Tokyo, London and New York, clear rules, visible and proportionate penalties, high-quality municipal services, and legible urban design make compliance the rational choice. Over time, these systems reduce the need for constant exhortation because cooperation is embedded in everyday governance. Where local governments lack the operational capacity, regulatory tools and financial autonomy to deliver such predictability, the social contract weakens, and civic order depends disproportionately on campaigns and appeals, with limited and uneven results.

---

<sup>46</sup> <https://gdb.indiatoday.in>

<sup>47</sup> <https://www.nagrika.org/post/civic-sense>

Chart XV.12: Gross Domestic Behaviour Survey Results



Source: India Today, Nagrik Post (<https://gdb.indiatoday.in>)

15.60. In practice, strengthening enforcement is not only an operational challenge but also an institutional coordination problem. Urban local bodies often operate within fragmented authority structures, overlapping mandates, and limited administrative autonomy, which dilute accountability for rule implementation. Where responsibilities for street management, traffic, solid waste, and public health are dispersed across multiple agencies, consistent enforcement becomes difficult even when intent exists. Aligning mandates, clarifying ownership of outcomes, and insulating routine enforcement from ad-hoc intervention are therefore central to making rule certainty credible in everyday urban governance.

### The new city: Creative, liveable, and interconnected

15.61. While fixing the aforementioned challenges, similar emphasis must be on the 'liveability' of cities. The existing 'Ease of Living Index' by MoHUA, incorporates ease of living by measuring quality of life across the parameters of education, health, housing, water and sanitation, waste management, mobility, safety, and recreation. In 2025<sup>48</sup>, the top 10 cities that topped Ease of Living are Pune, Navi Mumbai, Greater Mumbai, Tirupati, Chandigarh, Thane, Raipur, Indore, Vijaywada, and Bhopal. Notably, the cities on this list are largely newer or Tier-2 urban centres that have not yet been subjected to the intense population pressures experienced by Bengaluru, Delhi, or Mumbai over the past two decades. They remain ahead of the curve: urbanising, but not yet overwhelmed. Crucially, these cities already possess a foundational layer of infrastructure and viable

48 <https://tinyurl.com/mu5fsthr>

access to employment. Additionally, greenfield new cities such as Amaravati in Andhra Pradesh are coming up where an urban living space has to be designed from scratch. This combination creates a rare window of opportunity—where growth can still be shaped deliberately, rather than retrofitted after congestion, informality, and service deficits have set in.

15.62. Indian cities will not become more liveable by fixing footpaths alone. Liveability emerges when cities are designed around people's time, choices, and creativity, not just around infrastructure delivery. Globally, the most liveable cities are not necessarily the richest or newest; they are the ones that organise urban life to reduce friction, enable expression, and reward everyday participation.

15.63. The agglomerated densities of cities, if leveraging education and interconnectedness, grow faster than infrastructure-heavy ones. For example, Detroit in the US made massive investments in highways, factories, stadia, but ultimately did not keep up with the scale of investments in terms of economic output and yet the population collapsed. On the other hand, Boston in the US is infrastructure-light, with old housing styles, narrow lanes, and limited road and flyover construction, but it is swarming with educational institutions and a high concentration of universities. This has ultimately led to a shift towards modern and emerging sectors like education, finance, and biotech. In India, Bengaluru, arguably with insufficient physical infrastructure compared to Delhi or Mumbai, is almost the Silicon Valley of India, reaping the dividends of the agglomeration benefits of an entrepreneurial ecosystem. It grew primarily due to the concentration of engineering talent and institutions, and to wage growth and the creation of a modern city. Glaeser in the *Triumph of Cities* shows that a 10 percentage point increase in the share of college graduates in a city is associated with ~0.5–1 percentage point higher annual population and income growth.

## **Planning, Governance and Financing**

15.64. The Government of India has taken a series of concerted efforts to address the financing requirements of city and urban development. The Urban Infrastructure Development Fund (UIDF), announced in the Union Budget 2023–24 with an initial outlay of ₹10,000 crore, was designed as a revolving fund routed through financial institutions to support Tier-2 and Tier-3 cities that lack creditworthiness but have viable infrastructure projects. Operated through the National Housing Bank, UIDF is intended to finance well-prepared projects and recover capital over time, pushing cities toward better project structuring, cost recovery, and credit discipline. Close on its heels is the ₹1 lakh crore Urban Challenge Fund (UCF), announced in the Union Budget 2025-26, to build on this momentum by introducing competition and leverage into urban funding. The performance-linked urban financing mechanism will be used to

implement proposals for ‘Cities as Growth Hubs’ through Creative Redevelopment’ and enhancing water and Sanitation and financing bankable projects. The fund is structured to co-finance up to 25 per cent of the cost of bankable urban projects, subject to the condition that at least 50 per cent of the cost is funded through bonds, bank loans, and PPPs. An allocation of ₹10,000 crore in 2025-26 is expected to kick-start the fund and push Indian cities toward innovative, sustainable, and bankable infrastructure development rather than entitlement-based grants.

15.65. With such well-intentioned goals, it is essential that the regulatory and policy and implementation methodologies are also upgraded in sync with the objective of the economic planning. This requires a shift in thinking, from a scheme-compliance mindset to a balance-sheet and outcomes mindset. First, cities need to build credible, multi-year capital investment plans that integrate land use, transport, utilities, and economic development, instead of proposing isolated projects. Every million-plus city should be required to prepare a statutory 20-year City Spatial and Economic Plan, updated every five years, with three non-negotiable elements: (i) a transport network plan, (ii) a housing supply plan with annual unit targets, and (iii) a land-value capture framework linked to infrastructure corridors. Instead of discretionary case-by-case exemptions or incentives for FSI, planning permissions should shift to rule-based approvals using published FSI, height, and mixed-use norms related to transit. This single change would reduce uncertainty, accelerate redevelopment, and unlock formal housing supply in high-demand areas..

15.66. Finally, fiscal effort has to be hardwired into urban institutions. This means strengthening own-source revenues through property tax reforms, user charges linked to service quality, and systematic land value capture around infrastructure investments. Property tax should be converted into a self-updating area-based or capital-value tax in all large cities, with mandatory revaluation every few years using GIS and transaction data. Cities that meet minimum revenue-effort benchmarks should be allowed to issue municipal bonds without state guarantees, backed by escrowed property tax or user-charge revenues. Even modest but visible fiscal effort signals seriousness and is critical for crowding in debt or private capital under UCF-type structures. Central transfers should shift from scheme-based grants to performance-linked urban block grants, rewarding cities that increase own-source revenue, reduce approval timelines, and meet housing and mobility targets. These steps would allow cities to operate on balance sheets rather than utilisation certificates.

15.67. Most importantly, already in vogue in certain cities, it is necessary to institutionalise the implementation and service delivery mechanism. Million-plus cities may benefit from streamlining institutional frameworks and moving toward more integrated metropolitan governance models. This is one of the principal differences that

make Noida in UP<sup>49</sup>, different from Gurgaon in Haryana after a rain deluge<sup>50</sup>, despite both cities being satellite cities to Delhi. Even otherwise, dedicated urban project units, standardised contracts, and time-bound approvals reduce execution risk, which is often a larger deterrent than financing itself. States play a role here, but cities must own outcomes rather than act as pass-through agencies.

## Reimagining Physical Infrastructure

15.68. With sufficient ground coverage of urban infrastructure under AMRUT, Swachh Bharat, most large cities now have baseline assets in sanitation, water supply, and solid-waste management. The next phase of urban infrastructure must move beyond expanding coverage towards designing systems that are resource-conservative, financially-intelligent, and reflective of real-time data. World Bank estimates that India will need to invest \$840 billion<sup>51</sup> over the next 15 years—or an average of \$55 billion per annum—into urban infrastructure if it is to effectively meet the needs of its fast-growing urban population. There is no urban infrastructure type that exists in the world but has not been experimented with in India, a country that has everything from monorails, metros, BRTS, to open amphitheatres, rainwater harvesting structures, and more. However, compared to global cities, the gap is not in ambition but in coordination - Indian cities build roads, metros, drains, and utilities as separate projects rather than as interconnected systems. Moving forward, we need urban infrastructure that is integrated, people-centred and productivity-enhancing rather than fragmented and asset-driven. For e.g., Metro divorced from ToD (Transit-oriented Development) principles, stands as an engineering project rather than a city-shaping project. Station areas remain low-density, poorly connected, and constrained by rigid zoning, resulting in under-utilised capacity, weak farebox recovery, and limited impact on overall urban mobility, unlike global examples where metro stations anchor dense, mixed-use neighbourhoods that maximise ridership, shorten commutes, raise land values, and generate revenues to sustain the system. Efforts must be made to reduce the project-system mismatch to build integrated systems. Road expansion must be paired with effective parking management, pedestrian infrastructure, and prioritisation of public transport. Flyovers should give way to network-level traffic management and junction redesign. Additionally, drainage upgrades must be planned at the city scale, linked to natural water flows and land use patterns. Institutionally, this requires aligning planning, finance, and execution under a single urban or metropolitan authority, with clear incentives for coordination across sectors. Shifting the focus from asset delivery to system performance is essential if infrastructure investment is to translate into meaningful and sustained improvements in urban outcomes.

---

49 <https://tinyurl.com/wcztz53e>

50 <https://tinyurl.com/ykmzwr36>

51 <https://tinyurl.com/4jvmypd9>

15.69. Infrastructure funding should be conditional on city-climate plans, ensuring that drains, pumping stations, roads, and public spaces are designed for future rainfall and temperature patterns, not historical averages. Cities need to be incentivised as well as coerced into designing newer buildings with rainwater harvesting infrastructure. Examples of such systems exist within India, such as the IIM Kozhikode campus, and can be replicated in future greenfield cities of Amaravati. Grey-water reuse must be enforced through building codes, especially in water-stressed cities. Development control regulations can require minimum on-site water retention and reuse capacities, reducing pressure on municipal networks. Similarly, climate-responsive building codes—including ventilation norms, shading, reflective materials, and green roofs—can significantly lower indoor temperatures and energy demand at low cost. Cities like Ahmedabad, which pioneered heat-action planning, show that simple design and operational changes can save lives and reduce stress on urban systems. Use of local building material and local designs must be actively encouraged since they help in natural heat reduction and geophysical adjustment, as is shown in independent buildings in the country, such as Solar Passive Hostel, University of Jodhpur<sup>52</sup>, the TERI SRC building in Bengaluru and the Indira Paryavaran Bhavan<sup>53</sup>, New Delhi. Lessons from the Cochin International Airport, which is the world’s first fully solar-powered airport, can be used by other cities in similar sunshine-intensity areas.

15.70. Nature-based solutions<sup>54</sup> are also slowly becoming popular to address the urban heat island effect in cities in our tropical environs. Going forward, urban infrastructure must be planned as nature-based and circular systems, not linear utilities. Stormwater drains should be integrated with lakes, wetlands, and open spaces to absorb floods rather than merely channel water away. Solid-waste and wastewater systems should prioritise decentralised treatment, reuse, and energy recovery at the neighbourhood level (e.g., Areas in Surat). Transport and street design must incorporate shade, tree cover, and cool surfaces to counter urban heat. These interventions are not about adding new schemes; they are about rewriting standards and codes so that every road, building, and public space automatically contributes to climate resilience.

### Developing Social Order and Urban Civic Sense

15.71. Cities must prioritise rule certainty over rule proliferation: Urban governance works best when rules are few, legible, and consistently enforced. Fewer, enforceable by-laws, digitised challans, time-bound adjudication, and visible enforcement in high-friction public spaces are more effective than dense rulebooks that are weakly applied. Consistency and inevitability of enforcement matter more than severity. When penalties are predictable rather than discretionary, cooperation stabilises, and norms become

<sup>52</sup> <https://tinyurl.com/5cpasjc4>

<sup>53</sup> <https://tinyurl.com/442uyk9a>

<sup>54</sup> <https://greenglobe25.in/urban-cooling-solutions-in-india/>

self-reinforcing.

15.72. Urban design and service delivery must be used as behavioural instruments: Urban form and service operations should be treated as behavioural instruments. Legible street design with pedestrian priority, physically segregated lanes, defined vending and parking zones, and standardised signage reduces ambiguity and lowers compliance costs. Integrating civic outcomes into project design standards is more effective than addressing behaviour downstream. Operations and maintenance funding should be embedded in capital contracts, with service-level benchmarks and publicly reported periodic audits.

15.73. Incentives aligned with correct behaviour: A credible civic compact depends on visible value delivered by local governments. Property taxes, user charges, and fines should be transparently linked to improvements in neighbourhood services such as cleanliness, lighting, footpaths, drainage, and public safety. When citizens see tangible returns, their willingness to comply rises. Treating streets, footpaths, lakes, parks, and utilities as assets to be governed requires clear ownership of outcomes, defined rules of use, and shared accountability, backed by professional operations and maintenance budgets.

15.74. Using behavioural nudges to encourage social contract around civic sense: Behavioural tools work best when embedded in credible systems. Footpath markings, coloured lanes, queue lines, bin placement at points of waste generation, pedestrian countdown signals, and standardised parking bays make the right action intuitive. Public display boards showing service levels and compliance indicators shift expectations by making performance visible. Default options such as automatic waste segregation reduce reliance on individual choice. Behavioural cues reinforce cooperation when they are backed by consistent enforcement and reliable services.

15.75. System-based civic-sense awareness rather than episodic messaging: Communication should reinforce predictable systems rather than substitute for them. Simple, local, and repetitive messaging focused on a small set of high-impact behaviours works best when delivered at the point of action. Over time, environments that repeatedly teach, remind, and reinforce the same rules build habits. Civic charters and service guarantees can formalise this compact, signalling what citizens can expect from local governments and what they are expected to provide in return.

15.76. Efforts to strengthen civic order must recognise the distributional dimensions of urban rules. Street vending, informal transport, home-based enterprises and low-income rental housing are integral to the urban economy, and poorly designed or abruptly enforced regulations can impose disproportionate burdens on vulnerable

groups. Rule certainty, therefore, requires not only consistency but also fairness, consultation, and transitional support, so that compliance is experienced as legitimate rather than punitive. When rules are perceived as enabling livelihoods as well as order, cooperation becomes more resilient and self-sustaining.

#### Box XV.5: The concept of contextual compliance

Behaviour that appears unruly or indifferent to the commons in one context becomes orderly, considerate and norm-abiding in another — often within the same city, the same class of users, even the same individuals. Orderly conduct in the Metro rail service in Indian cities and the queues that greet the Mumbai BEST service are examples. Rather than disproving the perception, these examples help explain it: they show that behaviour toward the commons is highly context-dependent, and that good outcomes emerge when design, incentives and norms align. They transform an “open” commons into a structured, legible and predictable shared system. Several features tend to coincide in such cases.

First, the system is clearly designed to reduce ambiguity about what constitutes the right behaviour. Entry and exit lines, barriers, turnstiles, marked queues, platform doors or painted bays convert an undifferentiated public space into something closer to a rule-guided environment. When the environment signals order, people usually follow it; when space is ambiguous, they improvise, and improvisation in crowded settings often looks like chaos.

Second, there is a credible expectation of enforcement, even if it is light-touch. In the Metro, the presence of staff, fines and surveillance creates a background “shadow of authority”. But crucially, enforcement is consistent and impersonal, unlike in many other public settings, where it is uneven or negotiable. Where rules feel fair and predictable, compliance becomes easier to internalise.

Third, there is high reliability of service. If trains come at regular intervals and everyone knows that waiting a minute or two brings the same outcome, there is little payoff to pushing, grabbing or jumping the line. By contrast, in systems where scarcity, delay or uncertainty dominate — irregular buses, unpredictable traffic, intermittent utilities — people rationally switch to opportunistic behaviour because they cannot trust the system to treat patience fairly.

Fourth, repeated interaction among strangers in a stable system allows norms of mutual accommodation to develop. Once people see that others queue, give space, or avoid blocking doors, conformity starts to move toward order rather than disorder. The Metro’s “inside behaviour” becomes a social script; deviation attracts disapproval not only from authorities but from fellow passengers.

Fifth, there is often a degree of status and identity attached to the space. The Metro has come to symbolise modernity, efficiency, and civic pride; users perceive it as a valued asset rather than a neglected public utility. Where the commons appears broken, poorly maintained, or captured by vested interests, people feel less of a moral obligation to care for it — neglect breeds neglect.

There are similar pockets elsewhere: orderly boarding in parts of Chennai and Bengaluru’s metro systems, relatively disciplined pedestrian behaviour in some gated or well-managed public campuses, or compliance with rules in airports and passport queues. These are not simply “middle-class islands”; they are environments where institutional design and social expectations reinforce each other.

Commons works when institutions make cooperation rational, visible and dignified — through clarity of rules, reliability of provision, credible but fair enforcement, physical design that nudges behaviour, and a sense that the space belongs to everyone and is worth preserving. Where these elements are weak or absent, behaviour adapts in the opposite direction, often producing the very disorder that later gets moralised as cultural deficiency.

In sum, when governance, design and trust align, collective behaviour improves quickly — not because people change, but because the system does.

## NON-TANGIBLE ASPECTS OF FUTURE CITIES

15.77. However, even as the three wise men of Magi in the urban context, i.e, governance, financial devolution and urban infrastructure are strengthened, it becomes imperative to think of urban design from a future perspective. What should we do differently so that our cities look and behave differently from what we have always done? It is in this context that we can adopt certain principles:

- a. Time as the central urban resource: The most liveable global cities systematically minimise time lost to commuting, services, and uncertainty. Neighbourhood planning in new urban expansions and redevelopment zones should align housing, schools, anganwadis, health centres, and workplaces within short travel radii.
- b. Streets as social infrastructure, not just traffic corridors: Street design can be guided by Guillermo Penalosa’s “8-80” philosophy that good streets must work equally well for an eight-year-old and an eighty-year-old in order to prioritise safety, comfort and accessibility. In cities like Barcelona, the “superblock” model reclaims streets for walking, play, cafés, and culture by restricting through-traffic. Melbourne deliberately designed laneways to encourage cafés, art, and informal commerce, turning leftover spaces into cultural assets. Liveability will require a shift from road-widening to street-making, where public space is designed for lingering, interaction, and safety. 10–15 per cent of city streets need to be designated as pedestrian-first or low-traffic streets, especially in dense commercial and residential areas. Road-widening norms should include street design codes that mandate features such as shade, seating, vending space, and safe crossings. In certain cities, “weekend streets” can be piloted before scaling citywide.
- c. Encouraging creative density, not just economic density: Globally engaging cities

actively nurture art, music, design, food, and street culture as part of urban policy. Indian cities are culturally rich but institutionally hostile to creativity: restrictive licensing, noise rules without zoning nuance, lack of affordable inner-city spaces, and moral policing push culture into the margins. Making cities engaging in India means protecting spaces for expression, not over-regulating them out of existence. Low-rent creative zones in inner cities (e.g., craft clusters in Jaipur) should to be created using public or underutilised land and with single-window approvals for studios, theatres, institutional spaces (such as the Okhla Institutional Area in Delhi), rehearsal spaces, and galleries.

- d. Integration of informality through in-situ upgrading of informal settlements (tried in places such as Ahmedabad) with secure tenure, infrastructure, and incremental formalisation, instead of eviction plans. Streets need to be planned and designed for vendors with formalised vending spaces. The Street Vendors Act 2014, supported by schemes such as PM SVANidhi, has formalised street vending zones in certain states, including Madhya Pradesh, Odisha, and Assam.
- e. Governance that enables participation, not just compliance: Deliberate movement from the current model of distant and procedural urban governance to participatory models where citizens are invited into decision-making through neighbourhood councils, participatory budgeting, cultural grants, and transparent planning processes. This creates emotional ownership of the city (e.g citizenry participation in the Smart City Proposals). Planning documents, zoning changes, and infrastructure proposals should be publicly accessible and open to public comment by default.
- f. Finally, there is a psychological dimension: cities that inspire imagination. Cities like New York City and Amsterdam offer constant cues that ambition, diversity, and reinvention are the norm. Indian cities are aspirational but exhausting; they demand resilience rather than reward curiosity. To become engaging, Indian cities must move from survival-oriented urbanism to possibility-oriented urbanism, where public spaces, culture, mobility, and governance expand what people feel they can do with their lives.

15.78. As India competes globally for skilled workers, entrepreneurs, and ideas, cities that exhaust people will lose them, regardless of wage differentials. Cities that offer dignity, expression, and predictability will retain and attract them.

15.79. As long as citizens feel ownership of cities, they will assume responsibility for it, like their own houses – a phenomenon called the endowment effect. However, since the system fails and is unrewarding for common citizens, their ownership is limited

and often driven by individual values rather than collective sense. Improving daily service delivery, such as road maintenance and traffic management, can help reduce the cognitive load on citizens and foster a stronger sense of ownership.

## Conclusion

15.80. India stands at a pivotal moment in its urbanisation journey. The evidence presented in this chapter shows that the country is far more urban in economic, functional, and spatial terms than conventional definitions suggest. Yet our cities have not been equipped with the institutional, fiscal, and planning foundations commensurate with their role in national prosperity. Urbanisation has concentrated productivity, innovation and labour markets in our cities. But it has also concentrated congestion, informality, and complexity of governance.

15.81. Tackling these issues demands an integrated approach. On the supply side, unlocking urban land through clearer titles, improved density norms, and transit-oriented development can expand affordable housing and reduce peripheral sprawl. On the mobility front, prioritising people over vehicles through improving public transport and demand management can raise productivity while improving liveability. Urban sanitation, waste management, and water systems must evolve from coverage-led expansion to circular and resource-efficient systems.

15.82. These physical investments will deliver their full dividend only if accompanied by stronger metropolitan governance, predictable enforcement, and a credible civic compact that aligns incentives between citizens and the state. Cities will also need to be empowered with better finances and performance-oriented accountability. Ultimately, the promise of building India's urban future lies in making our cities economically dynamic, socially inclusive, environmentally sustainable and institutionally capable. They must work for the everyday lives of their citizens. When cities are planned, financed, and governed around this purpose, urbanisation can become a source of shared prosperity and a better quality of life for all citizens.

\*\*\*

## PART-I

# FROM IMPORT SUBSTITUTION TO STRATEGIC RESILIENCE AND STRATEGIC INDISPENSABILITY

*India enters the second half of the 2020s with stronger macroeconomic fundamentals than most major economies. Growth has been resilient, financial stability has been preserved, and policy autonomy has been retained despite repeated global shocks. These achievements matter. At the same time, the nature of India's development challenge is now changing. In a world characterised by geopolitical fragmentation, strategic trade, volatile capital flows, and rapid technological disruption, the central constraint is no longer macroeconomic management alone. It is the depth and quality of state capacity.*

*The chapter is structured in two parts. **Part I** situates India's development prospects within a changing global environment and argues that future economic strength will be determined not only by how fast India grows, but also by whether growth builds durable, productive capabilities, reduces external vulnerability, and embeds India more deeply into global economic systems. The chapter frames this transition as a movement from strategic resilience - the ability to absorb shocks and preserve stability towards strategic indispensability - the ability to become a source of reliability, capability, and value for others. Manufacturing, exports, disciplined indigenisation, and participation in global value chains are treated not only as economic objectives but as institutional stress tests that reveal whether the State can support learning, coordination, and execution at scale.*

***Part II** turns the lens from external challenge to internal change and argues that India's overarching priority is an institutional incentive structure that encourages action, experimentation, and learning under uncertainty. State capacity is examined not as a single reform agenda, but as a composite outcome shaped by how decisions are taken, how risk and failure are processed, how administration is organised around outcomes, how regulation is designed and delivered, and how incentives shape the behaviour of officials, firms, and citizens. Bureaucratic risk aversion, fragmented accountability, and proceduralism weaken the State's ability to act decisively and adaptively. At the same time, the chapter emphasises that capacity is co-produced: firms and citizens shape whether the State is pushed toward capability or pulled into discretion and enforcement.*

*The chapter also examines the ongoing compliance-reduction and deregulation initiative as a practical illustration of state capacity in action. Deregulation is treated not as regulatory withdrawal, but as institutional reorientation, shifting administrative effort from low-value policing toward coordination, facilitation, and problem-solving. In doing so, it demonstrates how disciplined friction removal can strengthen the State.*

*Taken together, the two parts advance a unified argument: India's ability to convert current macroeconomic strength into long-term strategic leverage will depend on whether the state can act under uncertainty, learn from implementation, coordinate across systems, and sustain discipline over time. State capacity, in this sense, is the economic infrastructure on which strategic resilience is built, and the pathway through which strategic indispensability becomes possible.*

सुखस्य मूलं धर्मः ।  
धर्मस्य मूलं अर्थः ।  
अर्थस्य मूलं राज्यः ॥

*The foundation of well-being is dharma.*

*The foundation of dharma is economic strength.*

*And the foundation of economic strength is the state.*

*–Chanakya Sutras*

## **We have done well**

16.1. Following the COVID-19 pandemic, the Indian economy has performed exceptionally well. India's growth rates are the envy of the world. The growth rate looks set to continue in the coming financial year. India's potential growth may have shifted higher towards 7.0%. The banking system is in good health. Credit intermediation remains healthy. The private sector is doing well and is investing, but can do more. Capital formation as a percentage of GDP is above 30%. The current account deficit is comfortably low. Foreign exchange reserves are ample. External remittances are strong. The agricultural sector is doing well. Monsoons have been good, and a good Rabi crop is expected. Rural sentiment is buoyant, with positive real wage growth in rural areas and rising rural consumption. Urban consumption, in comparison, is relatively more cautious, although the evidence is anecdotal. Contrasting evidence that paints a different and more optimistic picture is also available, especially since fiscal transfers to households by states have become sizable.

16.2. The government, on its part, has continued with public investment in infrastructure and incentivised states to do the same, offering 50-year interest-free loans. Furthermore, the government has undertaken significant structural reforms. Four labour codes, which provide flexibility to employers and fair treatment to workers, were notified in November 2025. The government has suspended many Quality Control Orders that, on balance, proved counterproductive for the economy, as they extended protection to large companies at the expense of downstream producers without corresponding obligations on the part of those protected.

16.3. In February 2025, the government offered significant relief to households by raising the minimum tax threshold to 12 lakhs for individuals. A family of two income earners would not have had to pay tax on an annual income of up to around Rs. 26.7 lakhs. Together with extremely low food price inflation over the past year, this has left considerable disposable income in the hands of households. In September, the government implemented a far-reaching reform of the Goods and Services Tax, reducing the number of slabs to two and shifting many items to the lower slab. That further boosted household purchasing power and lowered inflation. The government simplified the income-tax provisions and the language. It opened up the insurance sector and nuclear power generation to foreign investors and the private sector, respectively, as announced in the February 2025 budget.

16.4. Apart from these reform initiatives, the government has been systematically strengthening national resilience by investing in achieving self-sufficiency in critical minerals and semiconductors, as well as supporting the shipbuilding industry through sustained and persistent efforts. These are covered in greater detail in Chapters 8, 9 and 10, respectively.

16.5. More importantly, following the surprise of the reciprocal tariffs and penal tariffs imposed by the U.S. government on India in April and August, respectively, the Indian government intensified negotiations with other countries to open more markets for Indian exporters. The government also passed a relief package for exporters and announced a five-year export promotion package to support expansion into new geographies.

16.6. As a result of the government's systematic and laser-focused efforts, the economy is well-positioned to continue growing. That prospects look good amid pervasive global uncertainty is all the more creditable.

### **Not so sure about the world**

16.7. Global uncertainties are not only pervasive but also deeply structural. For better or worse, the global order that had prevailed for five and a half decades since the War

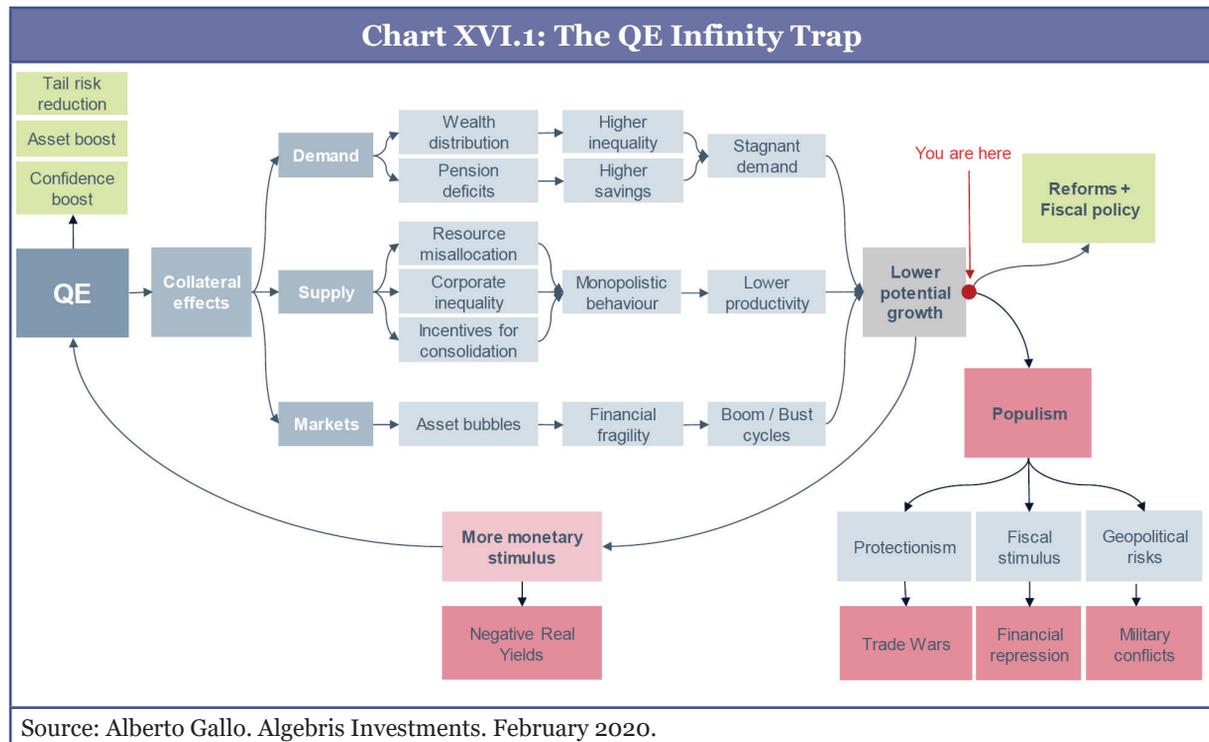
ended began to unravel in the new millennium. The first warning came with the end of the TMT (Telecommunication, Media and Technology) and Internet bubble in the early 2000s. China entered the World Trade Organisation in 2001 and, over the next two decades, proceeded to become a global manufacturing and export powerhouse, upsetting manufacturing and investment across developed and developing nations. Then came the big one – the global financial crisis of 2008. It almost caused a collapse of the financial sector in America and significantly dented the world's confidence in the U.S. dollar and the American model of post-industrial financialisation-led growth, pursued since the 1980s.

16.8. The response of policymakers in the developed world was to use short-run monetary policy tools as the stabiliser of aggregate demand for a long period. Policy rates were lowered to zero, and long-term rates were kept lower through the active purchase of government bonds by central banks. These actions further financialised their economies and made manufacturing-centric communities vulnerable to social and economic disruption.

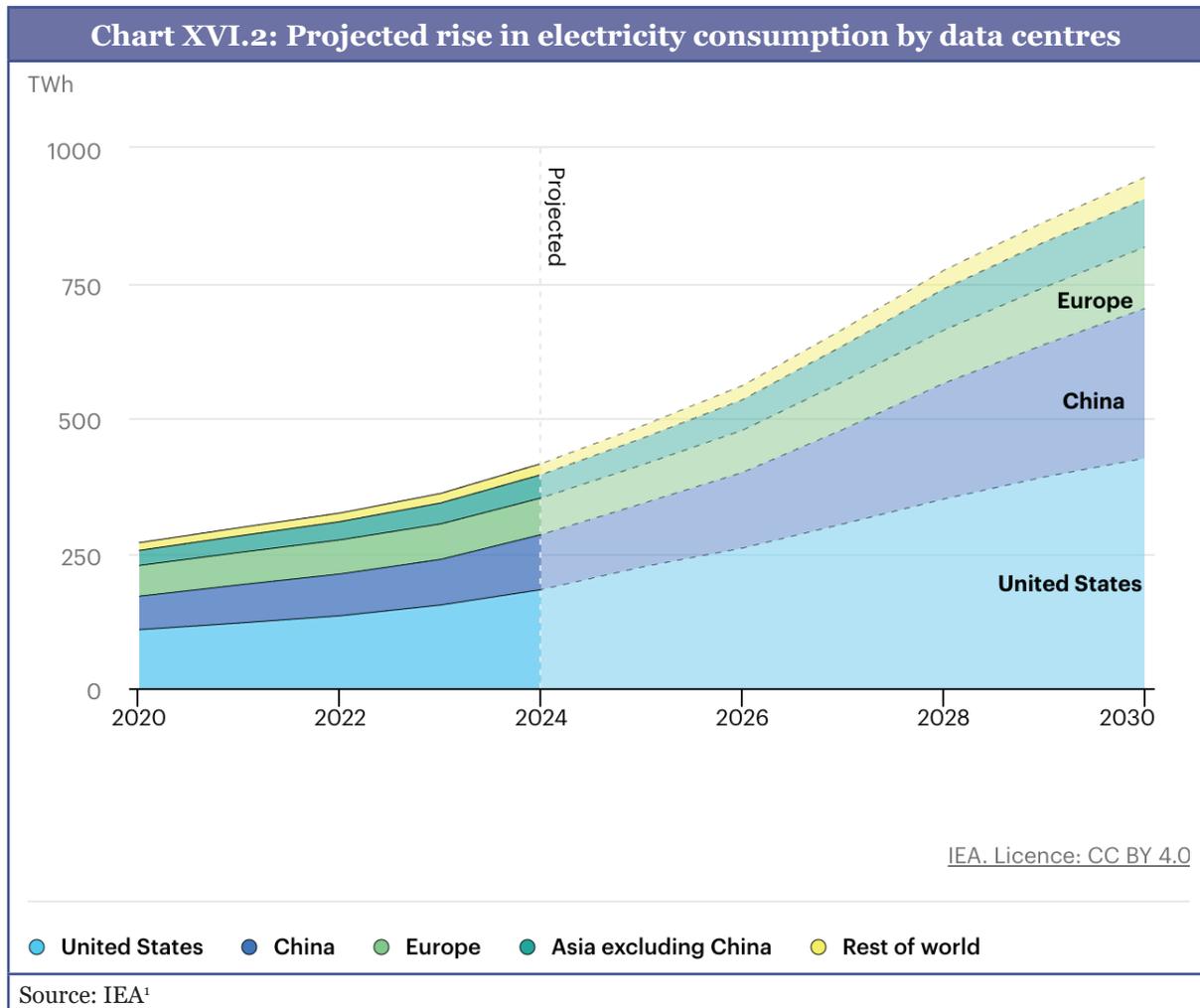
16.9. The onset of COVID-19 in 2020 and the disruption it caused further aggravated economic and social problems across the world. Globally, public sector debt has increased significantly due to policy actions taken to address the pandemic. The rise of China as a manufacturing export powerhouse, rising debt, growing middle-class disaffection, and declining growth have brought about political changes across the Western world, upending the international economic order that has prevailed since the 1980s.

16.10. Presciently, in February 2020, shortly after the COVID-19 pandemic broke out, fund manager Alberto Gallo warned that the extraordinary monetary easing that followed the 2008 Global Financial Crisis – and the even more aggressive response to the pandemic – risked locking advanced economies into a prolonged phase of ultra-loose monetary conditions. After a decade of quantitative easing and steadily declining nominal and real interest rates, monetary policy, he argued, was losing traction in stimulating productive investment, with liquidity instead flowing into interest-rate-sensitive and safe-haven assets, inflating asset prices and compressing real yields – a dynamic he termed the “QE Infinity Trap”, in which economies become dependent on sustained accommodation merely to preserve activity. Several elements of this prognosis are now visible: financial repression and negative real yields have unfolded in much of the developed world, while geopolitical tensions, trade frictions and conflict have contributed to a more uncertain and fragile global environment. With that, the world has entered a period of uncertainty, unpredictability and danger. The new administration in the United States is also re-evaluating its approach to alliances and relationships and is busy reconfiguring them. Trade has become a matter of bilateral

agreements rather than multilateral arrangements. Countries are pursuing beggar-thy-neighbour trade policies, and export licensing is now more the norm than the exception.



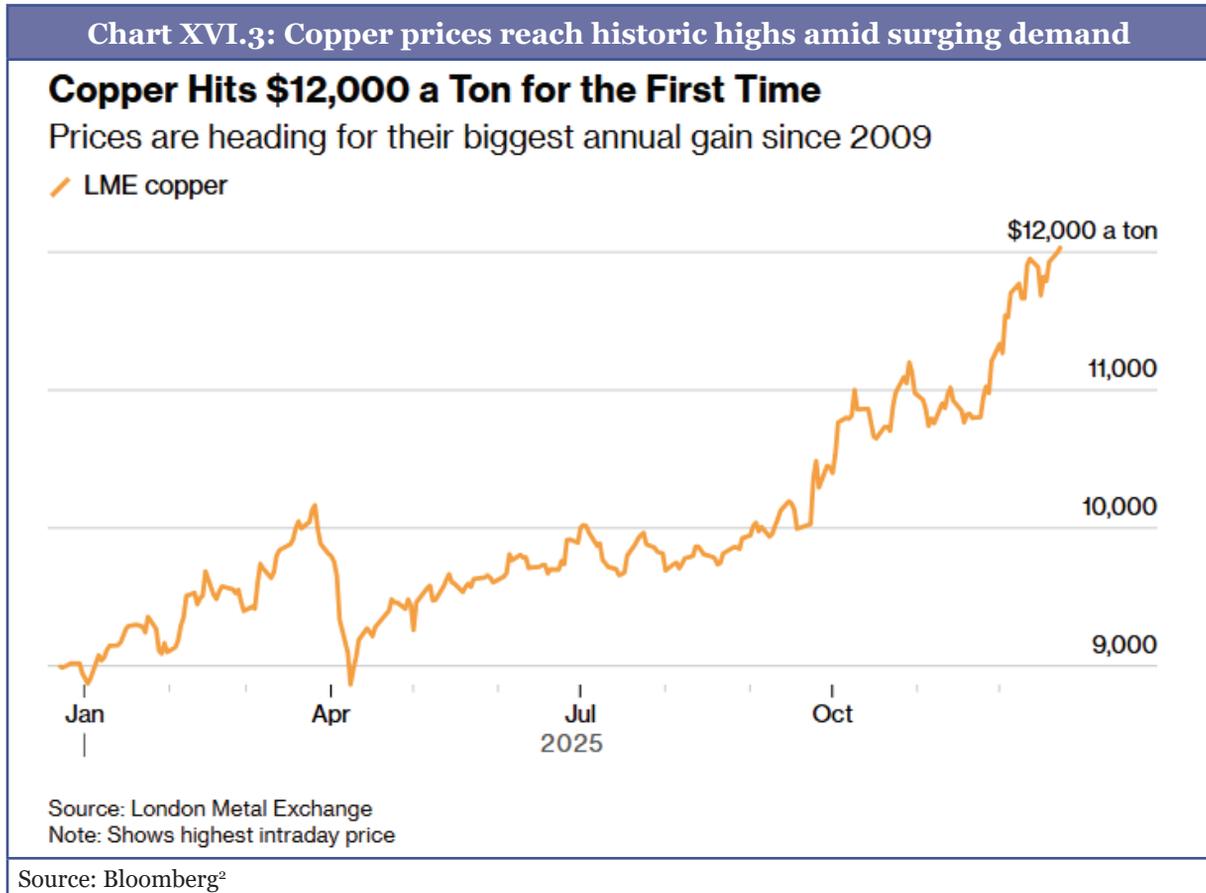
16.11. In the meantime, more than two decades after the end of the first technology bubble, America and some parts of the world are betting heavily on a boom in Artificial Intelligence (AI), reshaping how we work, how we secure ourselves and how we learn and teach. Where techno-optimism leads, financial engineering follows. In this instance, history may be repeating itself rather than just rhyming. For the time being, the development of AI has proceeded along resource-intensive lines. This intensification of energy demand is reflected in the sharp projected rise in electricity consumption by data centres across major regions (Chart XVI.2). Grids have become unstable, power supply is disrupted, and energy costs have risen, compounded by the push towards intermittent power sources like solar and wind. Frugal AI may be possible, but it is not yet on the horizon, nor is it yet on a commercial or global scale. The US federal government has prevented states from regulating AI.



### Narrower and narrowing alliances

16.12. The surge in power demand has led to a corresponding increase in demand for copper. Copper prices have surged nearly a fifth in 2025 (Chart XVI.3), even as yields have fallen. Not just critical minerals and rare earths, but even basic metals will face supply constraints as demand surges and supply tightens due to both natural and nationalistic reasons.

<sup>1</sup> International Energy Agency (IEA), Data centre electricity consumption by region, base case (2020–2030). <https://tinyurl.com/4fc63kk5>



16.13. Stating that the 20th century ran on oil and steel and that the 21st would run on ‘compute’ (short-hand for computing power or Graphic Processing Units (GPU)) and the minerals that feed it, America announced a Pax Silica Declaration<sup>3</sup> with a few like-minded countries, aimed at building the AI ecosystem of tomorrow, from energy and critical minerals to high-end manufacturing and models.

16.14. In the meantime, the United States passed the GENIUS Act (Guiding and Establishing National Innovation for U.S. Stablecoins Act) in July 2025, which would take effect from January 2027 or 120 days after the implementation regulations are issued, whichever is earlier.<sup>4</sup> Regulated private sector institutions can issue US dollar-backed stablecoins. Depending on its success, it carries the potential to disrupt capital flows to emerging and developing economies.

16.15. India has managed its external accounts prudently in the last decade. Foreign exchange reserves have risen, external debt remains manageable, and crisis episodes have been navigated without systemic collapse. These achievements reflect sound

<sup>2</sup> Mark Burton and James Attwood. Bloomberg. 23 December 2025. <https://tinyurl.com/375y6tv4>

<sup>3</sup> U.S. Department of State. Pax Silica Summit. December 11, 2025. <https://www.state.gov/releases/2025/12/pax-silica-initiative/>

<sup>4</sup> United States House Committee on Financial Services. July 2025. Guiding and Establishing National Innovation for U.S. Stablecoins Act (GENIUS Act): Section-by-Section Summary. <https://tinyurl.com/2x9az5bm>

macroeconomic management. Yet the source of stability matters. Much of India's external financing has come through portfolio flows, debt inflows, and episodic surges of foreign investment. These flows are valuable, but they are conditional and reversible. They respond not only to domestic fundamentals, but to global liquidity cycles, risk sentiment, and geopolitical developments beyond India's control. Currencies backed primarily by capital inflows behave differently under stress than currencies backed by persistent export surpluses. In moments of global risk aversion, capital retrenches. Exchange rates adjust, sometimes abruptly. Central banks can help smooth volatility, but they cannot permanently offset structural imbalances through reserve accumulation or interest rate adjustments. This is the hard constraint confronting India's macroeconomic aspirations, and India has already felt its impact this year.

16.16. High market valuations and questions over the long-term trajectory of Indo-American relations, stemming from America's imposition of high tariffs on India and its establishment of warm relations with Pakistan, prompted portfolio investors to take profits and wait on the sidelines. While foreign direct investment inflows have improved, they have not been enough to offset the large portfolio outflows. Further, Indian companies have also been required to invest in other countries due to rising trade restrictions. One has to produce locally to be able to sell locally. With India running an overall trade deficit because the surplus in the services trade does not offset the deficit in the goods trade, and with remittances and net invisibles also insufficient, India relies on global capital flows to finance its imports. When that fails to materialise to the extent needed, the currency is vulnerable to depreciation.

### **Deepening uncertainties lie ahead**

16.17. As 2025 drew to a close, China made a significant announcement regarding Hainan Island. The Hainan Free Trade Port (FTP) is China's bold experiment to open its economy more extensively than anywhere else on the mainland. Instead of being just a city or a small zone, the whole island province of Hainan has been turned into a special trade and business area with very relaxed rules on trade, customs, taxes, investment, and visas.

16.18. In simple terms, tariffs on most imports are removed, allowing goods from abroad to enter the island without customs duties. The island operates a special customs system separate from mainland China. Goods made in Hainan that add real value (e.g., with at least 30% local processing) can be sold throughout the rest of China without additional tariffs if they meet rules designed to encourage genuine production, rather than just re-export. Within the island, goods, people, capital and services flow freely with minimal friction. This officially began on December 18, 2025, when Hainan's full-island customs operations commenced, marking it as a functioning free trade port.

16.19. For India, Hainan's Free Trade Port is best understood not as a single disruptive shock but as a gradual structural development that subtly changes the economics of trade, logistics and investment in China's near neighbourhood. In practical terms, it creates a large, low-tariff, services-heavy economic space in the northern reaches of the Indian Ocean and the South China Sea, which could, over time, influence patterns of supply-chain routing, tourism flows, and corporate investment decisions in Asia.

16.20. The significance of this development, however, lies not only in the competition it creates for investment, but in the way it unfolds within a global setting that is becoming more unsettled, where decisions about production, capital and supply chains are increasingly entangled with a broader sense of fragility in the world economy.

16.21. As we write this chapter<sup>5</sup>, despite the initial impression that the world economy has weathered the 2025 shocks better than feared, the situation remains fragile. The window for 'Business As Usual' (BAU) or 'muddling through' may be closing with respect to the economy, politics and financial markets. Chances of a moderate to significant disruption or a major rupture in world affairs exceed the chances of a 'BAU' scenario. As a country dependent on global capital flows, India has to plan for liquidity and external capital buffers in the coming year. Capital flight, including with the advent of U.S. stablecoins, is another risk to watch out for. India will remain better placed than most in its ability to maintain a decent growth rate, but its resilience will be tested as strategic vulnerabilities persist due to external dependence for capital, energy and other critical inputs, such as fertilisers.

16.22. Looking further ahead, India will have to be prepared for a prolonged period of geopolitical uncertainties and conflicts, as well as the consequent disruptions in developed societies. It is quite possible that the period between now and 2045 might resemble the interwar years of the twentieth century. Of course, numerous innovations occurred during the 1930s, amidst the Great Depression and the onset of war.<sup>6</sup> The war itself contributed to the growth of industrial capacity that later served the global economy well. But to survive such a turbulent period and to turn necessities into innovations requires not a defensive but a proactive or offensive policy framework. Indeed, the contours of a more uncertain and strategically contested world are already visible in the international economic environment confronting India today.

16.23. The global economic environment confronting India today is materially different from that of the previous phase of globalisation. Assumptions that shaped much of the post-Cold War period, such as open trade, predictable rules, stable capital flows, and relatively apolitical interdependence, hold less firmly today. Trade, technology, finance,

<sup>5</sup> We were writing this on the 3rd January 2026 when the United States announced a successful regime change in Venezuela

<sup>6</sup> See Morgan Housel: <https://collabfund.com/blog/careful-what-you-wish-for/>, April 2017.

and supply chains are increasingly shaped by strategic considerations. In this setting, outcomes depend not only on macroeconomic stability or factor accumulation, but on institutional and strategic capacity.

16.24. Institutional and strategic capabilities take time to build. They require patient institution-building, firms that compete rather than rely on shelter, and citizens who internalise rules rather than treat them as negotiable. Capability-building also involves trade-offs between speed and patience, protection and competition, and autonomy and integration that cannot be avoided but only managed.

16.25. This reflects a deeper change in how major manufacturing powers now view trade itself<sup>7</sup>. China, in particular, increasingly treats trade not as a reciprocal exchange between interdependent economies, but as a transitional phase in a longer strategy of production dominance, seeking to sell to the world while steadily reducing its own dependence on external suppliers. In such a setting, openness becomes asymmetric, where some countries remain exposed to external markets and inputs, while others retain the ability to restrict access with limited self-inflicted cost.

16.26. In a world where economic relationships are increasingly strategic and contested, the ability to learn selectively becomes a core element of statecraft. The epic *Ramayana* provides a valuable metaphor for strategic learning in complex and contested environments. In the *Yuddha Kāṇḍa*, the moment of *Ravana's* defeat becomes a lesson in discernment, as Lord *Rama* reflects that insight may be drawn even from adversaries, without inheriting their values or methods. The teaching is subtle yet powerful: learning is compatible with autonomy. In today's fragmented global economy, the capacity to learn without dependence becomes an essential strategic skill.

### ***Swadeshi* is inevitable and necessary**

16.27. The strategic context has shifted in ways that materially alter the calculus of openness. Export controls, technology denial regimes, carbon border mechanisms, and industrial policy in the West and East alike signal the end of naïve globalisation. We operate in an environment where access to inputs, technologies, and markets cannot be assumed to be frictionless or permanent. In such circumstances, *Swadeshi* becomes a defensive as well as offensive policy lever: a means to ensure continuity of production in the face of external shocks, and a pathway to build enduring national capabilities that reinforce economic sovereignty. The policy question is no longer whether the state should encourage *Swadeshi*, but how it should do so without undermining efficiency, innovation, or global integration.

---

<sup>7</sup> Robin Harding. Financial Times. 26 November 2025. China is making trade impossible. <https://tinyurl.com/ykhfyhbn>

16.28. Not all import substitution is desirable, and not all forms of protection support long-term competitiveness. The most persistent objection to *Swadeshi*-oriented policies is not ideological but empirical. India's own history, like that of many developing countries, offers ample examples where protection bred complacency, entrenched inefficiency, and insulated firms from global competition. *Swadeshi* is a disciplined strategy rather than a blanket doctrine.

16.29. Import substitution is justified when domestic production is already feasible at reasonable cost but is impeded by non-economic factors such as coordination failures or legacy regulatory burdens, when temporary and explicitly time-bound protection can facilitate learning, scale-building, and productivity gains, when the protected industry is subject to export discipline and measurable performance benchmarks, and when the good concerned is strategically critical even if cost disadvantages persist. These conditions differentiate intelligent import substitution (conditional protection) from indiscriminate sheltering of domestic incumbents.

16.30. The converse also holds: permanent protection is inappropriate in sectors where India is already cost-competitive, where exports are being undertaken at scale, where products serve as general-purpose intermediates across supply chains, or where inputs are critical for labour-intensive industries. In such cases, protection risks raising economy-wide costs, dampening competitiveness, and weakening export potential. Similarly, we must caution against protection that shields poor-quality producers, entrenches incumbency through inverted duty structures, or severs the link between support and innovation, learning, and global integration. The lesson is that protection without productivity-enhancing investment, capability upgrading, and export orientation creates fragility rather than strength.

16.31. A disciplined approach to indigenisation requires clarity on when intervention builds long-run capability and when it merely preserves inefficiency. A simple decision framework for indigenisation and protection in a fragmented global economy is presented below. The objective is not to justify intervention in general, but to discipline it. The framework proceeds by identifying where intervention may be warranted, clarifying where it should be avoided, and embedding discipline through sequencing, conditionality, and export exposure.

16.32. In practice, the application of this framework yields differentiated priorities. Some inputs are systemically critical and warrant early attention due to concentrated global supply or strategic exposure. Others are economically viable candidates for domestic capability building, where scale, learning, and export orientation can deliver competitiveness over time. A third category comprises goods for which import dependence does not translate into vulnerability, and where domestic substitution may raise costs without enhancing resilience. The tiered framework below formalises this differentiation (Chart XVI.4).

### **Tier I: Critical vulnerabilities with high strategic urgency**

16.33. This tier includes goods, components, and technologies where denial of access would impose immediate and asymmetric national costs, and where global supply is highly concentrated. Typical examples include defence-critical systems, core infrastructure inputs, energy security components, public health essentials, and foundational industrial technologies.

16.34. For Tier I items, the objective is assured availability under stress, not short-term efficiency. Domestic production may be justified, even if it is initially costly. However, support must remain disciplined. The goal is to establish minimum assured domestic capacity within a defined timeframe, not permanent protection.

### **Tier II: Economically feasible capabilities with strategic payoffs**

16.35. This tier comprises goods where domestic production is economically feasible at reasonable cost, but imports persist due to coordination failures, historical path dependence, early scale disadvantages, or entrenched procurement and contracting practices rather than genuine comparative disadvantage.

16.36. Indigenisation in this tier is primarily justified on economic grounds, with strategic benefits serving as a complement. The objective is not protection for its own sake, but rather accelerated capability formation through scale, learning by doing, and integration into global value chains. Temporary and targeted support can help firms overcome early barriers, but must be explicitly time-bound, performance-linked, and conditional on productivity improvement, cost convergence, and export readiness. In practice, this tier could include manufacturing activities characterised by modular production, scope for scale economies, and exposure to competitive export markets.

16.37. Without export exposure and credible exit, intervention in this tier may risk entrenching inefficiency rather than building capability.

### **Tier III: Low strategic urgency or high-cost substitution**

16.38. This tier includes goods for which import dependence does not create systemic vulnerability, where global supply is diversified, or where domestic substitution would impose high economy-wide costs relative to the strategic benefits.

16.39. For these items, indigenisation may be unwarranted. Risk may be better managed through diversified sourcing, inventory buffers, or contractual safeguards rather than domestic production. Attempting to indigenise such inputs risks raising downstream costs, weakening export competitiveness, and converting resilience policy into implicit taxation of the manufacturing ecosystem. In such cases, restraint itself is a form of strategic discipline.

16.40. These tiers are not static. Items may move across tiers as technologies mature, costs decline, or geopolitical conditions change. What matters is that indigenisation proceeds sequentially rather than simultaneously, with policy effort concentrated where strategic returns are highest. Where feasible, indigenisation should culminate in export capability, which is the distinguishing feature of intelligent import substitution.

<b>Chart XVI.4 From Import Substitution to Strategic Resilience: A Tiered Framework for Strategic Indigenisation</b>		
<b>Indigenisation – High Urgency Sectors</b>		
<b>HIGH URGENCY</b> <i>Macro/Security exposure is significant</i>	<p><b>HIGH FEASIBILITY</b> <i>Near-term capability build is realistic</i></p> <p><b>TIER 1 (NON-NEGOTIABLE)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Rapid domestic scale-up</li> <li>• <b>Policy stance:</b> Demand assurance, procurement alignment, standards, time-bound support</li> <li>• <b>Products:</b> Oils &amp; pulses, Fertiliser inputs, APIs, Power electronics, Industrial chemicals, Telecom equipment</li> </ul>	<p><b>LOW-MEDIUM FEASIBILITY</b> <i>Requires phased, long-horizon effort</i></p> <p><b>TIER 1 (STRATEGIC CORE)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Vulnerability reduction, not full substitution</li> <li>• <b>Policy stance:</b> Diversification, partnerships, selective reshoring, learning curves</li> <li>• <b>Products:</b> Magnets, Battery cells &amp; cathodes, Solar wafers &amp; cells</li> </ul>
<b>Indigenisation – Developmental / Capability-Build Sectors</b>		
<b>LOW-MEDIUM URGENCY</b> <i>Exposure manageable; development goals dominate</i>	<p><b>HIGH FEASIBILITY</b> <i>Near-term capability build is realistic</i></p> <p><b>TIER 2 (SELECTIVE DEEPENING)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Competitiveness upgrading</li> <li>• <b>Policy stance:</b> Gradual localisation, clusters, exports, firm learning</li> <li>• <b>Products:</b> Cranes, Industrial machinery, EV drivetrains, Medical devices (non-critical)</li> </ul>	<p><b>LOW-MEDIUM FEASIBILITY</b> <i>Requires phased, long-horizon effort</i></p> <p><b>TIER 2/3 (LONG-HORIZON CAPABILITY)</b></p> <ul style="list-style-type: none"> <li>• <b>Objective:</b> Ecosystem and talent formation</li> <li>• <b>Policy :</b> Co-engineering, test-beds, procurement-linked learning, no near-term localisation mandate</li> <li>• <b>Products:</b> TBMS, Rail signalling, Defence electronics, Electrolysers</li> </ul>

## **A new National Input Cost Reduction Strategy: competitiveness as infrastructure**

16.41. For export discipline to work in India's favour, competitiveness must be achievable and affordable. Resilience strategies can fail if they raise costs across the economy. A repeated lesson from successful industrialisers is that protecting final goods while leaving input costs high makes it harder to scale production and compete internationally. Affordable and reliable inputs are foundational to competitiveness. For India, if indigenisation is to strengthen resilience without eroding exports, it must be paired with systematic input-cost reduction. This is the rationale for a National Input Cost Reduction Strategy.

16.42. Input costs of raw materials, intermediates, energy, logistics, and compliance shape competitiveness across sectors. Unlike final-goods protection, which benefits a narrow set of producers, elevated input costs impose diffuse and persistent penalties on downstream manufacturing, exports, and employment. Thin margins in export-oriented manufacturing, high sensitivity among MSMEs, and weaker incentives to invest in upgrading make this constraint binding. In this sense, input costs function like infrastructure, as they may raise transaction costs across the economy.

16.43. Tariff inversion illustrates the problem. Higher duties on intermediates than on finished goods penalise downstream producers and encourage assembly-oriented imports rather than deeper domestic value addition. This erodes competitiveness, discourages exports, and increases reliance on protection for final goods. Correcting such distortions is not a marginal trade adjustment, but a structural reform with economy-wide implications.

16.44. The core logic of an input-cost strategy is rule-based rather than sector-specific. Inputs widely used across sectors should not be treated as revenue sources or protection instruments once domestic capacity exists. Protecting such inputs may benefit a small number of producers, but it raises costs for many downstream users, weakening competitiveness and job creation. Lowering input costs strengthens multiple value chains simultaneously.

16.45. A structured, rule-based distortion audit can guide reform, avoiding ad hoc adjustments, by asking whether an input is widely used, whether domestic capacity exists, whether protection materially raises downstream costs, and whether continued support serves a strategic purpose or merely entrenched interests. Inputs imposing high economy-wide costs without clear justification become candidates for rationalisation.

16.46. Indigenisation and input-cost reduction can coexist when their scope is clear. Targeted support for critical components can coexist with competitive pressure on

general-purpose inputs once the capability exists. This prevents indigenisation from becoming across-the-board protection.

16.47. Such reforms are, of course, difficult because benefits are dispersed, while resistance is concentrated. Sustaining reform requires a clear articulation of economy-wide gains and rule-based processes that limit discretion and capture. Lower input costs enhance export competitiveness, facilitate global value chain integration, increase employment, and stimulate incentives to invest in upgrading. Treated strategically, they allow manufacturing and exports to reinforce each other, strengthening both resilience and external stability.

16.48. Reducing input costs is a necessary foundation for competitiveness, but it is not sufficient for capability building. Lower costs remove system-wide handicaps, but they do not by themselves create discipline, learning, or scale. Once the economy becomes cost-competitive, the binding constraint shifts from prices to performance, in the form of reliability, process control, quality, and coordination across institutions. It is at this stage that advanced manufacturing becomes decisive. Advanced manufacturing exposes weaknesses that sheltered activities can absorb for long periods. It tests infrastructure, logistics, regulation, skills, and enforcement simultaneously, and it does so under external benchmarks that cannot be negotiated away. In this sense, input-cost reduction prepares the ground, but advanced manufacturing is where capability is actually built and revealed.

### **Advanced manufacturing as a disciplining system: why manufacturing shapes institutions**

16.49. Advanced manufacturing matters not only because it expands output and exports, but because it exposes weaknesses that sheltered activities can carry for a long time. When production is process-driven, scale-intensive, and benchmarked against global standards, small frictions compound into failures in cost, quality, and reliability. That is why advanced manufacturing becomes a stress test for the state and for firms. It forces predictable rules, reliable infrastructure, faster logistics, enforceable contracts, and institutional follow-through. Cost control, operational reliability, and continuous improvement become conditions for survival, not optional aspirations. Adjustment can be uncomfortable, but it is also transformative.

16.50. Unlike activities that can operate in enclaves, manufacturing is embedded in supply chains and factor markets. It depends on ports, power quality, transport reliability, standards and certification, dispute resolution, and predictable administration. When these are weak, the penalty is immediate and externally visible. In that sense, manufacturing does not merely benefit from state capacity; it also actively calls it forth by making governance failures costly to conceal.

16.51. In sheltered activities and protected sectors, firms can survive by substituting access for efficiency. Regulatory discretion, administrative mediation, or protection can sustain profitability even when productivity lags. However, in advanced manufacturing, survival depends entirely on execution, not negotiation, and that pressure reshapes firms, institutions, and incentives.

### **Learning, scale, and the discipline of competition**

16.52. Manufacturing capability is accumulated, not declared. Early stages are often inefficient, and learning occurs through repeated process improvement, supplier development, and incremental upgrading. But learning becomes a capability only when paired with discipline. Support that is unconditional and permanent becomes shelter. Support that is time-bound and performance-linked can enable learning while still fostering competitiveness, especially through export exposure.

16.53. India's experience also highlights a contrast with services-led growth. Services exporters can often operate through specialised infrastructure, regulatory carve-outs, or organisational separation from domestic supply chains. As a result, services can thrive even when broader transaction costs remain high. Manufacturing, by contrast, engages multiple factor markets and public systems simultaneously. Weaknesses in logistics, standards enforcement, or coordination are quickly and visibly apparent.

### **Why East Asia Matters (and Why It Is Often Misread)**

16.54. Any discussion of *Swadeshi*, import substitution, or industrial policy inevitably turns to East Asia. Japan, South Korea, Taiwan, Singapore, China, and, more recently, Vietnam are routinely cited as success stories. Yet the lessons drawn from these experiences are often superficial or selective. Some observers focus narrowly on protection, while others emphasise export orientation or macroeconomic stability. Both miss the deeper institutional logic that made these strategies work. The central lesson from East Asia is not that the state intervened, but how it intervened—and, equally importantly, how it exited. These economies did not succeed because they avoided mistakes; rather, they succeeded because their systems were designed to learn from mistakes and to reallocate resources when bets failed. This required a level of bureaucratic autonomy, political backing, and performance discipline that many countries found difficult to sustain.

16.55. For India, the relevance of East Asia lies in understanding the architecture of state capacity that underpinned its industrialisation. Without that architecture, similar-looking policies can produce radically different outcomes.

### Box XVI.1: East Asia – Architecture of State Capacity

#### **Japan: Bureaucratic Authority Anchored in Outcomes**

Japan's post-war industrialisation is often associated with its powerful economic bureaucracy, particularly the Ministry of International Trade and Industry (MITI). What is less frequently appreciated is the incentive structure under which Japanese bureaucrats operated.

Officials enjoyed long tenures within ministries, deep sectoral specialisation, and significant discretion in policy design. Crucially, their careers were not derailed by individual project failures, provided those projects were aligned with national objectives and implemented in good faith. This reduced the fear of experimentation and encouraged calculated risk-taking.

At the same time, support to firms was never unconditional. Subsidies, credit access, and protection were tied to performance metrics, including export growth, technological upgrading, and scale. When firms failed to meet expectations, support was withdrawn, even if this entailed short-term disruption.

The Japanese model combined bureaucratic empowerment with accountability for outcomes, not processes. It also relied on dense information flows between the state and industry, allowing policymakers to update strategies based on real-world feedback rather than static plans.

#### **South Korea: Failure Tolerance with Ruthless Exit**

South Korea's experience offers perhaps the starkest illustration of disciplined industrial policy. The Korean state actively promoted national champions, provided directed credit, and protected domestic markets in the early stages. Yet this support came with explicit expectations and severe consequences for non-performance.

Bureaucrats frequently rotated between government and industry, ensuring a practical understanding of production constraints and global competition. Failure, when aligned with national goals, did not end careers. What was not tolerated was persistent underperformance.

The state withdrew support when firms failed to meet export targets or achieve technological upgrading. Several chaebol collapsed or were restructured under pressure from the state. The political economy of this system was harsh, but it prevented the accumulation of "zombie" firms living off protection.

For India, the Korean lesson is that discipline must be visible, predictable, and enforced, even when it is politically inconvenient.

#### **Singapore: Speed, Regulatory Flexibility, and Credibility**

Singapore represents a contrasting but complementary model. Lacking a large domestic market, it focused on becoming indispensable within global value chains through reliability, speed, and regulatory credibility.

Regulatory agencies were empowered to waive or adapt rules temporarily to facilitate investment and innovation. Speed of execution was valued over formal perfection.

Importantly, this flexibility was accompanied by strict enforcement once standards were set, preserving trust and predictability.

Singapore's experience highlights a dimension often neglected in Indian debates: regulatory friction is itself a competitiveness variable. Even well-designed industrial policies can fail if approvals, clearances, and dispute resolution are slow or uncertain.

### **Vietnam: Relentless Cost Reduction and Institutional Learning**

Vietnam's recent manufacturing success underscores the importance of continuous cost reduction and institutional adaptation. Rather than relying heavily on protection, Vietnam focused on reducing regulatory and transaction costs, reportedly by as much as 20 per cent in certain periods.

This approach made Vietnam an attractive destination for global supply chains seeking diversification. While its domestic technological base remains limited, its integration into global manufacturing networks has accelerated learning and capability formation.

The lesson here is not that protection is unnecessary, but that competitiveness is multi-dimensional. Cost structures, regulatory efficiency, and labour productivity matter as much as tariff policy.

## **The Common Thread: The Entrepreneurial State**

16.56. Despite their differences, East Asian experiences share a common institutional logic, i.e., the presence of an entrepreneurial state. This does not mean a state that replaces markets, but one that is willing to experiment, take calculated risks, absorb failures, and dynamically reallocate support. This approach becomes especially critical in an environment where policy is made under uncertainty, outcomes cannot be known in advance, and mistakes cannot always be reversed without cost.

16.57. Three features stand out:

- i. Outcome-oriented bureaucracy: Officials are evaluated on results, not rule-following.
- ii. Failure tolerance with learning: Errors are acceptable; stagnation is not.
- iii. Credible withdrawal of support: Exit is as important as entry.

16.58. These features are conspicuously absent in systems where industrial policy has failed. Where bureaucracy is punished for honest failure, risk aversion dominates. Where support cannot be withdrawn, inefficiency is entrenched. In such systems, institutions respond to uncertainty not by learning and adapting, but by avoiding action altogether, weakening state capacity over time.

16.59. The East Asian experience does not offer a ready-made template for India. But it does offer a clear message that industrial policy has a far better chance of success with institutional reform.

## **From *Swadeshi* to Strategic Resilience to Strategic Indispensability**

16.60. India's policy challenge does not stop with institutional reform for achieving import substitution or *Swadeshi*, or domestic industrial policy, and doing it intelligently

in terms of making the industry meet world standards. India also needs to build domestic capacity in areas that would make it strategically resilient. Strategic resilience is about building buffers and strengths to withstand external shocks. It means investment in national strength. Intelligent Import Substitution is the first step in investing in national strength. ‘Investment in national strength’ takes us to the next stage of ‘strategic resilience’ and then to the final stage of ‘strategic indispensability.’ Table XVI.1 formalises this distinction by placing import substitution, strategic resilience, and strategic indispensability side by side in terms of their core purpose.

**Table XVI.1: Proposed Conceptual Definitions**

Concept	Definition	Core Objective
<b>Import Substitution</b>	An economic strategy that promotes domestic production of goods that were previously imported.	To reduce import dependence by producing domestically what was earlier imported.
<b>Strategic Resilience</b>	A broader capability of an economy or system to withstand external shocks, including geopolitical, economic, technological, or environmental, and continue functioning.	To ensure continuity, adaptability, and security of critical supply chains and capacities under stress.
<b>Strategic Indispensability</b>	Integration of the economy with global systems in a way that makes an economy fundamentally important to the global system and gets others interested and invested in its continued functioning.	To take on global leadership and enable leverage in geopolitical negotiations and conflicts

16.61. Table XVI.2 highlights how this transition alters the economic focus, time horizon, and geographic logic of policy. Table XVI.3 complements this by summarising how underlying assumptions, policy instruments, and risk orientation evolve across these stages.

**Table XVI.2. From Import Substitution to Strategic Indispensability: A Comparative Perspective**

Dimension	Import Substitution	Strategic Resilience	Strategic Indispensability
<b>Economic Focus</b>	Mainly sectoral (manufacturing, consumer goods, intermediate goods).	Systemic (spans energy, food, data, health, defence, infrastructure, and technology).	Global-embedding national industries and technologies as indispensable nodes in global networks.

Dimension	Import Substitution	Strategic Resilience	Strategic Indispensability
<b>Time Horizon</b>	Short-to-medium term industrial policy tool.	Medium-to-long term national capability framework.	Long-term structural positioning in global value chains and institutions.
<b>Geographic Logic</b>	<b>Produce at home:</b> focus on domestic value addition.	<b>Diversify and secure:</b> mix of domestic, allied, and friendly sources.	<b>Shape and anchor:</b> build and control critical global interdependencies.

**Table XVI.3. Policy Logic and Risk Orientation across Import Substitution, Strategic Resilience and Strategic Indispensability**

	Import Substitution	Strategic Resilience	Strategic Indispensability
<b>Underlying Assumption</b>	Domestic capacity can replace imports effectively.	Global interdependence will persist; risk management through redundancy and diversification is essential.	Global interdependence can be shaped; national power lies in being a node that others cannot bypass.
<b>Policy Tools</b>	Tariffs, local content mandates, subsidies, protective measures.	Supply chain mapping, redundancy planning, friend-shoring, stockpiling, dual sourcing, R&D security.	Building horizontal and ecosystem efficiencies to enhance competitiveness, aim for global dominance
<b>Risk Focus</b>	Trade deficit, industrial underdevelopment.	Systemic vulnerabilities, including energy shocks, pandemics, cyberattacks, and geopolitical coercion.	Global influence or relevance, over-exposure to external rule-making or technology ecosystems

16.62. India's challenge is that the three stages of Aatmanirbharta that will bring us closer to the goal of *Viksit Bharat* are telescoped into each other due to the rapidity of the flux the world is experiencing. A famous quote, "*There are decades where nothing happens; and there are weeks where decades happen,*" is attributed to Vladimir Ilyich Lenin. We are in a period where decades seem to happen in weeks. Interestingly, Russia is playing an instrumental role in the current episode.

16.63. Therefore, India must pursue its near, medium and long-term policy priorities of import substitution, strategic resilience, and strategic indispensability simultaneously. There is no time to waste. It is like running a marathon and a sprint at the same time, or having to run a marathon like a sprint!

16.64. *Aatmanirbhar Bharat* is often discussed as a defensive response to supply chain disruptions, geopolitical tensions, or economic coercion. While resilience is a necessary objective, it is not a sufficient one in itself. A nation that merely absorbs shocks remains reactive. A nation that shapes outcomes becomes influential. This is a higher bar than self-sufficiency and a more demanding aspiration than resilience.

This distinction between resilience and influence is also reflected in external comparative assessments of economic power in Asia, discussed in Box XVI.2.

#### Box XVI.2: From Resilience to Influence - India's Power Gap in Asia

Recent external assessments reinforce the distinction between resilience and influence. The Lowy Institute's Asia Power Index (2025)<sup>8</sup> provides a useful lens in this regard.

The Index distinguishes between resources (what countries possess) and influence (how effectively those resources are translated into regional outcomes). It also introduces the concept of a Power Gap, which measures the divergence between a country's expected influence based on its resources and its realised influence.

India's profile in the Index is instructive. India has now reached major power status in Asia, and its overall power continues to grow steadily. For the first time since the Index was launched in 2018, India's ranking on economic relationships has improved. Notably, India has overtaken China as the leading destination for inward investment in Asia, after the United States, measured on a ten-year cumulative basis. This reflects both the geopolitical diversification of supply chains and India's growing attractiveness as an investment destination.

At the same time, the Index highlights persistent gaps. India ranks 3rd in overall power, but 10th in economic relationships, and records a negative Power Gap (-4.0), indicating that India is not yet translating its resources into external economic influence.

The picture that emerges is mixed but revealing. India has demonstrated strong resilience and absorptive capacity in the face of global shocks. The next phase of its development challenge is different: to move from being primarily a recipient of stability to becoming a source of stability and opportunity for others.

This transition from resilience to interdependence is central to India's journey towards *Viksit Bharat*. It underscores that competitiveness, export capability, and deep integration into regional and global production networks are essential instruments of influence in a fragmented world.

16.65. The highest form of economic power is influence exercised without coercion, when others align with our interests because it is in their interest to do so. Strategic indispensability delivers precisely this form of power. With strategic indispensability comes global influence. When global firms rely on Indian production, when supply

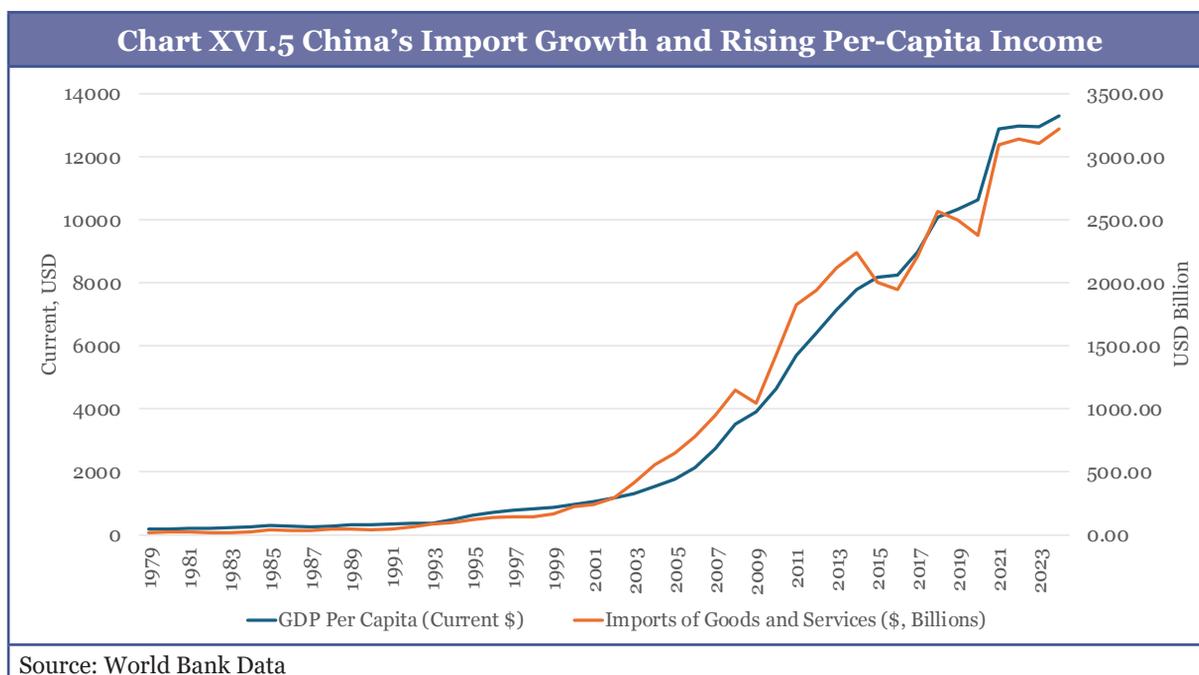
<sup>8</sup> Lowy Institute. Asia Power Index. 2025 Edition. <https://power.lowyinstitute.org/power-gap/>

chains cannot be easily reconfigured without India, and when Indian exports are trusted by default, the country’s voice carries weight beyond its borders. This is the promise of *Aatmanirbhar Bharat* grounded in strategy.

16.66. In simple terms, when the world moves from ‘thinking about buying Indian’ to ‘buying Indian without thinking’, India will have attained strategic indispensability. The Prime Minister threw down the gauntlet to the industry in his address to the nation on Independence Day, when he said that *Swadeshi* meant producing goods of the highest quality at the lowest possible price, so that people would be automatically drawn to buying Indian.

### Manufacturing, Export capability, and currency strength

16.67. *Swadeshi* must not be judged solely by import reduction, but by the creation of export capability. Creating capability is both urgent and important in a world where capital flows are increasingly shaped by shifting geopolitical alignments and national interests rather than neutral market forces. As India's economy grows, its imports are expected to rise. This is evidenced in the history of economic development over the last two centuries, and is therefore not a policy failure. In reality, import growth is inevitable and even desirable as incomes rise and economies diversify. Chart XVI.5 illustrates this pattern by showing that China’s imports rose as its per-capita income increased, even as China became a top global producer of goods ranging from steel and cement to fertilisers, cars, and drones.



16.68. In India’s case, such inevitable import growth also brings currency vulnerability into sharper focus. As a rising economic power, it is reasonable for India to aspire to

a strong and stable currency. Currency strength is often associated with advanced economies. However, the notion of a “hard currency” is frequently misunderstood as being driven only by monetary orthodoxy or central bank credibility. While these are necessary conditions, they are not sufficient.

16.69. The exchange rate is best understood as a signal rather than a policy objective. It reflects a combination of trade balances, capital flows, risk perceptions, and geopolitics. Hard-currency behaviour emerges when markets believe that a country can earn foreign exchange reliably through trade, that external liabilities are matched by productive external assets, that the economy can withstand shocks without emergency financing, and that currency depreciation is not the primary adjustment mechanism.

16.70. Historically, currencies that exhibit such behaviour, including those of Germany, Japan, Switzerland, and later East Asian industrialisers, have rested on their export capabilities rather than dependence on capital inflows. Monetary discipline reinforced this foundation; it did not create it. Capital inflows can support growth, but they are reversible. Export earnings, by contrast, are earned repeatedly through competitiveness rather than confidence alone. India’s currency, by contrast, remains structurally soft. This is not a failure of policy, but a reflection of underlying trade dynamics. As long as economic growth mechanically widens the trade deficit, the exchange rate must continue to act as a buffer against external pressure.

16.71. Currency depreciation will therefore remain the primary adjustment mechanism unless export capabilities are developed rapidly. The export capability envisaged here primarily refers to manufacturing exports, not service exports, in which India has achieved remarkable success. India’s performance in IT, business services, and professional services has been extraordinary. These exports have generated foreign exchange, supported growth, and deepened global integration. However, services exports face intrinsic limitations. They are less employment-intensive at scale, generate fewer backward linkages, rely heavily on open digital regimes, and do not anchor physical supply chains. They are necessary, but insufficient to counterbalance the import intensity of industrialisation. Manufacturing exports, by contrast, create supplier ecosystems, absorb large workforces, and generate durable trade surpluses when scaled. They remain the only proven route through which late-industrialising economies have achieved lasting external strength.

### **Route to Strategic Indispensability runs through Global Value Chains**

16.72. Manufacturing export capability does not emerge overnight. Its foundations are scale, reliability, and integration built over time through disciplined capability building. Integration refers to embedding Indian firms into global value chains as well as embedding global production systems within India.

16.73. Global trade is increasingly concentrated around a relatively small set of multinational production networks. This reinforces the importance of attracting such firms to India, not merely as sources of capital, but as anchors of export capability and currency strength.

16.74. Foreign Direct Investment is not a homogeneous category. The identity of investors matters as much as the volume of investment. A small number of global brands, particularly in electronics, machinery, apparel, automotive, and consumer goods, account for a disproportionate share of world trade.

16.75. Evidence from global trade data suggests that nearly half of the developed world's imports from China originate from the supply chains of roughly fifty multinational brands. These firms do not merely assemble products. They orchestrate ecosystems comprising supplier networks, logistics platforms, quality systems, and continuous design feedback loops that shape entire industries.

16.76. For India, attracting such firms is not about prestige. It is about accelerating ecosystem formation. When a global brand commits at scale, suppliers follow, skills deepen, standards rise, and exports become endogenous rather than policy-driven. This represents the fastest route from *Swadeshi* as capability-building to *Swadeshi* as strategic indispensability.

## The Role of the State

16.77. The state's role in this vision is demanding. It must be firm in enforcing discipline, flexible in adapting rules, and fair in allocating support. Firmness ensures that protection does not become entitlement. Flexibility allows policy to respond to feedback rather than assumptions. Fairness preserves legitimacy and prevents capture. Balancing these attributes is difficult, but not optional. States that fail on any one dimension either stifle initiative, entrench inefficiency, or provoke backlash.

16.78. India's diversity and federal structure are often cited as constraints on its development. In reality, they can be sources of strength. Different states possess different endowments, geographic, demographic, and institutional, and can specialise accordingly. A national *Swadeshi* strategy should enable competition among states, reward outcomes, and disseminate best practices. The government's task is to set direction, remove frictions, and provide credibility.

16.79. The journey from resilience to indispensability can be but need not be long. It requires patience, discipline, and institutional courage. But it is neither unprecedented nor unattainable. India has the scale, the talent, and the democratic legitimacy to attempt it. What remains is alignment between intent and execution, between policy

and institutions, between short-term pressures and long-term goals. If that alignment is achieved, *Aatmanirbhar Bharat* will be remembered as a doctrine of confident integration in a fractured world. To achieve the right alignment, we must reimagine the state. That is what we turn to in Part II of the Chapter.

\*\*\*

*This page has been left blank*

## **PART-II**

# **BUILDING STRATEGIC RESILIENCE AND STRATEGIC INDISPENSABILITY: THE ROLE OF THE STATE, THE PRIVATE SECTOR AND THE CITIZENS**



कर्मण्येवाधिकारस्ते मा फलेषु कदाचन ।  
मा कर्मफलहेतुर्भूर्मा ते सङ्गोऽस्त्वकर्मणि ॥

*You have a right to action alone, not to the fruits of your labour.*

*Do not let the fruits of action be your motive, nor allow yourself to fall into inaction.*

*–Bhagavad Gita, Chapter 2, Verse 47*

### **Why is State Capacity the binding constraint today?**

16.80. India's economic development over the past three decades has unfolded within an institutional setting that is distinctive in both comparative and historical terms. It is a rare example of a large, diverse, low-middle-income country that has combined sustained growth with democratic continuity, periodic macroeconomic consolidation, and incremental yet cumulative policy reform. This achievement has rested not only on markets and entrepreneurship, but also on a State that has gradually learned to reconcile stability with change in a society marked by plural preferences and high expectations of public provision. Any discussion of state capacity must therefore begin from this vantage point, not of institutional failure, but of demonstrated resilience and adaptive competence.

16.81. As discussed in the first part of this chapter, India is now entering a phase of development qualitatively different from that experienced since the early 1990s. Structural economic transformation at home is unfolding against a backdrop of persistent and profound geopolitical reconfiguration. The global economy is shifting towards a more segmented form of globalisation, in which trade is increasingly organised around blocs, capital flows are shaped by strategic and security considerations, access to technology is selectively restricted, and geopolitical risk premiums are embedded in economic decisions.

16.82. In this setting, the demands placed on the State have not diminished; they have changed in character. Stability, prudence, and democratic legitimacy remain indispensable, but they are no longer sufficient on their own. They must now be

complemented by a greater capacity to coordinate across institutional boundaries, to act with confidence under conditions of uncertainty, and to change course when learning exposes the limits of prior assumptions. The central question is therefore no longer whether India has the right policies or the right institutions, but whether it possesses sufficient state capacity - institutional, administrative, social, and cognitive to operate effectively in a world that is less forgiving of disorder, indiscipline, and short-termism.

16.83. State capacity, in this chapter, is understood in the sense articulated by Somanathan and Natarajan (2022)<sup>1</sup>, as the ability of the government to “get the right things done.” It refers not merely to the availability of resources or formal authority, but to the institutional capability of the State to effectively design policies, implement them, and deliver on commitments made to citizens. State capacity, in this conception, spans both policymaking and execution, and rests on administrative judgement, technical competence, and organisational arrangements that allow the State to act under constraints and uncertainty. Weak development outcomes, in this view, arise less from a lack of ideas or intent than from deficiencies in the State’s ability to translate decisions into sustained and reliable action.

16.84. In what follows, this part of the chapter advances a simple but central argument. India’s most consequential constraint today is no longer the absence of policy intent, ideas, or resources, but the incentive structures within institutions that shape how decisions are taken under uncertainty. This core constraint manifests across multiple domains: bureaucratic risk aversion, organisational design, regulatory practice, private-sector behaviour, and citizen expectations. The sections that follow examine these manifestations in turn, not as independent weaknesses, but as interlinked expressions of the same underlying incentive problem. The chapter then examines ongoing efforts at deregulation and compliance reduction as a practical test of whether institutional alignment can be restored in practice.

### **Why entrepreneurial governance is hard**

16.85. The first part of this chapter argued that a world of deep uncertainty requires a shift towards an entrepreneurial state, not to replace markets, but to act under uncertainty, structure risk, and learn systematically. Accepting this diagnosis, however, raises a more difficult question: if such a state is conceptually necessary, why has it proven so difficult to realise in practice? The answer lies not in intent or ambition, but in the institutional mechanisms through which risk, failure, and accountability are processed.

---

<sup>1</sup> Somanathan, T. V., & Natarajan, G. (2022). *State capability in India*. Oxford University Press.

16.86. For starters, India's difficulty lies in the fact that its institutional environment has evolved in ways that place an asymmetric burden on visible action relative to procedural continuity, especially under conditions of uncertainty. Temporary measures have often become permanent through what might be called irreversibility creep, raising the stakes of any experiment. Good-faith decisions are subjected to retrospective scrutiny through audits, vigilance processes, and judicial review, often without adequate recognition of the uncertainty under which they were taken. Entrepreneurial initiatives are evaluated using metrics suited to routine administration, such as compliance, revenue collection, and procedural correctness, rather than learning, capacity creation, or long-term impact.

16.87. No country that has successfully navigated structural transformation attempted to make its entire bureaucracy entrepreneurial. Equally, it may not be possible for the bureaucracy to be entrepreneurial all the time, because stability and predictability too are necessary traits of good administration. Instead, successful states created bounded institutional spaces - zones where experimentation was permitted, accountability rules were differentiated, and learning was explicit. Japan's sectoral desks, Korea's planning agencies, and Singapore's regulatory institutions all functioned as such safe spaces.

16.88. For India, entrepreneurial safe spaces could take several forms: mission-based cells focused on manufacturing, energy, logistics, or urbanisation; regulatory sandboxes extending beyond fintech into labour, environmental, and trade regulation; explicit legal protection for good-faith decisions; and independent ex-post review mechanisms that prioritise learning over blame. Such spaces are not exempt from accountability, but are legally bounded domains in which accountability recognises ex-ante and real-time uncertainty rather than retrospective certainty. What matters is not the specific institutional form, but the underlying principle: experimentation must be bounded, reversible, and accountable in a manner appropriate to uncertainty.

16.89. Democracy adds a layer of complexity. In democratic systems, politicians are often closer to lived realities and public sentiment, while bureaucracies provide continuity, memory, and procedural integrity. The risk, of course, is that politicians drift into populism while bureaucracies drift into insularity. An entrepreneurial state requires a more subtle division of labour. Political leadership must set direction and articulate priorities. Bureaucracies must discover pathways, solve problems, and adapt instruments. Institutions must absorb error without collapsing into either paralysis or permissiveness. Whether a bureaucracy is becoming entrepreneurial can only be assessed through its learning capacity.

16.90. Moving from diagnosis to action requires reform on several fronts. Legal and institutional frameworks must codify protection for good-faith decision-making and clearly separate error from corruption. Incentive systems must reward problem-solving

and capacity-building rather than mere procedural compliance, and rotation policies must allow for continuity when learning is cumulative. Accountability mechanisms must shift away from hindsight-driven punishment towards context-aware review, while visibly penalising inertia where damage is clear. Above all, political leadership must send consistent signals that reversible failure is acceptable, experimentation is necessary, and course correction is a mark of competence rather than weakness.

16.91. A useful contrast is provided by the experience of the Republic of Korea,<sup>2</sup> which illustrates how entrepreneurial state capacity was built not through bureaucratic boldness alone, but through carefully designed institutional sequencing. Korea's early export-led industrialisation forced firms to comply with demanding foreign standards, initially as adopters rather than setters. This created an external discipline that reduced discretion while simultaneously compelling learning. Over time, the Korean state invested systematically in national standards bodies, metrology, and conformity assessment, treating them not as peripheral technical functions but as core instruments of industrial strategy. Crucially, these institutions operated as bounded spaces in which technical judgment, experimentation, and feedback from firms were encouraged, while accountability remained aligned to ex ante objectives rather than ex post outcomes.

16.92. The broader lesson is not one of institutional replication, but of design logic. Accountability mechanisms focused on whether decisions were reasonable given the information available at the time, rather than on whether all outcomes succeeded. This architecture allowed the state to act under uncertainty without paralysing fear of error, and to evolve from a rule-taker to a rule-shaper in global markets. For India, the relevance lies in the principle that entrepreneurial governance emerges when experimentation is disciplined, incentives are aligned to learning, and institutional design explicitly distinguishes good-faith error from malfeasance.

16.93. The opportunity before India is considerable. Few countries possess India's scale, diversity, institutional depth, and democratic legitimacy. If these assets are combined with a bureaucracy that is capable of acting entrepreneurially (disciplined, reversible, and learning-oriented), the state can move beyond being a regulator of economic activity to a catalyst for structural transformation. In a world defined by uncertainty, it is not the most controlling states that will succeed, but those that learn fastest, adapt most intelligently, and retain the confidence to correct course. India has the institutional foundations to do so. The task now is to align mindset, incentives, and accountability with that possibility.

---

<sup>2</sup> Lee, H., & Kim, M. J. (2025). From Standards Adopter to Standards Author: The Case of the Republic of Korea. Background paper for World Development Report. <https://tinyurl.com/42aredst>

### Box XVI.3: Bureaucratic Integration, the Entrepreneurial State, and Mobilising Culture for Scale in India

In India's social and business life, trust tends to be strongest within families, castes, communities, and familiar networks, and much weaker outside them. Inside these circles, people rely on reputation, social pressure, and mutual support to manage risk and enforce good behaviour. Beyond them, transactions become more uncertain, more costly, and harder to scale. As a result, individuals and firms often stick to familiar networks, not out of preference alone but because dealing across social boundaries carries greater risk and higher penalties when things go wrong. In this way, culture limits how far economic activity can easily expand at any given moment.

Over time, state-led efforts at bureaucratic integration have eased this constraint by replacing personal connections with predictable rules and procedures. When authority is impersonal and reliable, people can transact with strangers without having to rely on trust built through kinship or community. After Independence, national examinations and public-sector career ladders produced cross-regional élites with portable credentials; land reforms in parts of the country weakened entrenched hierarchies; and the creation of national financial and regulatory institutions enabled firms to engage the state as formal entities rather than through local intermediaries. More recently, platforms such as Aadhaar, the Unified Payments Interface, GST, and digitised land and property records have reduced dependence on relational credit and informal verification, allowing small entrepreneurs and migrants to transact beyond their immediate circles. In logistics and exports, the standardisation of customs and port procedures has begun to weaken historically entrenched commission networks. Culture continues to matter, but its ability to limit cooperation beyond close networks is weakened.

The entrepreneurial state complements this institutional integration by coordinating expectations and bearing risk in sectors where fragmented private actors would otherwise hesitate to act. In automotive components in Tamil Nadu, pharmaceuticals in Gujarat and Hyderabad, and more recently electronics manufacturing clusters in Noida and Sriperumbudur, public policy has not only regulated but convened and aggregated: facilitating cluster formation, underwriting early investment, shaping procurement and export pathways, and making global standards attainable for small and mid-sized firms. In renewables, space, defence manufacturing, and select digital infrastructure, public institutions have signalled technological direction in advance of market consensus.

These initiatives have worked not by negating cultural repertoires but by selectively mobilising them. Industrial upgrading and strategic manufacturing have been framed as projects of national dignity, technological self-respect and upward mobility. This narrative function is particularly important in a low-trust environment, as it legitimises collaboration with unfamiliar partners, compliance with common standards, and the transition from informal networks to formal systems, without requiring individuals to disavow their local loyalties. Culture thus becomes partially endogenous to policy.

The Indian experience also underscores the limits of this endogeneity. Hierarchy, insider advantage and patronage frequently re-embed themselves within new institutional shells. Yet, where bureaucratic integration has reduced uncertainty and the entrepreneurial state

has provided visible ladders of mobility — as in segments of the automobile, pharmaceutical, and electronics industries — kinship-based constraints have become less binding, and coordination has scaled without cultural rupture.

Seen this way, state capacity is not about overriding culture but about making it less binding. The task is to lower the penalty for stepping outside one's circle through fair and predictable institutions, and to raise the reward for doing so through credible pathways to technological and economic upgrading. When that occurs, elements of the same cultural repertoire, such as aspiration, thrift, perseverance, status ambition, and pride, can be mobilised as assets for development and scale rather than as barriers to them.

16.94. As the State takes on a more active coordinating role of integrating markets, convening actors, and shaping expectations, the nature of institutional risk also changes. Actions taken to reduce uncertainty and facilitate activity can gradually harden into expectations and routines, raising the cost of adjustment over time. For an entrepreneurial state, the ability to withdraw or recalibrate becomes as important as the ability to act. Box XVI.4 examines this issue through the lens of hysteresis and policy reversibility, and its implications for the exercise of state capacity under uncertainty.

#### **Box XVI.4: Hysteresis, Policy Reversibility, and the Entrepreneurial State**

In public policy, hysteresis occurs when temporary measures become permanent, when incentives solidify into entitlements, and when regulatory or administrative interventions alter expectations and political alignments in ways that render reversal costly or infeasible. Subsidies, protection, exemptions, and discretionary approvals are particularly prone to this dynamic. Once economic and political actors reorganise around such interventions, reversing them can trigger litigation, political backlash, and administrative disruption. Anticipating this, officials rationally avoid experimentation altogether, leading to institutional risk aversion and policy inertia.

An entrepreneurial state cannot function under such conditions. Entrepreneurship in governance does not mean boldness without restraint; it means acting under uncertainty while preserving reversibility. Avoiding hysteresis therefore requires deliberate design of state capacity along three dimensions: staffing, processes, and mindsets.

First, staffing structures must privilege judgement over risk avoidance. Entrepreneurial functions such as mission cells, regulatory sandboxes, and policy pilots require small, stable teams with analytical depth, legal support, and continuity of tenure, insulated from routine compliance and ex post policing. Thin but capable decision layers reduce the tendency to lock in permanent solutions merely for defensibility.

Second, reversibility must be built into administrative processes by default. Schemes should be designed with explicit exit options rather than assumed permanence. Sunset clauses, staged scaling, conditional rollouts, and mandatory post-implementation reviews should be routine for subsidies, exemptions, and experimental regulations. Equally important is the separation of learning-oriented ex-post review from blame-oriented scrutiny. Where

oversight mechanisms assess decisions against information available at the time (rather than outcomes revealed later), officials retain the confidence to act.

Third, administrative mindsets must shift from 'correctness' and adherence to precedence, to judgment. In high-uncertainty environments, credibility lies not in never reversing course, but in revising decisions transparently as evidence evolves. This requires a clear institutional distinction between good-faith error, design failure, implementation failure, and malfeasance. Without such differentiation, fear substitutes for judgement, and institutions learn to delay rather than decide.

Hysteresis risk is not uniform across policy domains. It is highest where benefits are concentrated and costs are diffuse – subsidies, protection regimes, financial forbearance, land and environmental permissions, and large infrastructure contracts. In such areas, entrepreneurial action must be especially bounded, legally disciplined, and accompanied by credible exit mechanisms. Political leadership plays a critical role here by absorbing some of the short-term costs of reversal to protect long-term administrative learning.

A state that cannot reverse cannot learn; a state that cannot learn cannot adapt. Preventing hysteresis is therefore not a technical refinement, but a foundational requirement of an entrepreneurial state.

## **Learning without forgiveness: Why States that punish failure lose the future**

16.95. Policies that operate in uncharted terrain, whether in industrial strategy, financial regulation, technology governance, or social policy, cannot be optimised ex ante. They must be tested, revised, and sometimes abandoned. Yet Indian institutions treat visible correction as evidence of incompetence rather than maturity.

16.96. Institutional forgiveness does not mean leniency, nor does it imply the abdication of accountability. It is not a tolerance of corruption or negligence. On the contrary, forgiveness becomes meaningful only when it is paired with a clear distinction between good-faith error and malfeasance. High-capacity states draw this distinction sharply. Low-capacity states blur it, often deliberately, until fear substitutes for judgment.

16.97. Historically, the states that escaped this trap did so by building institutional memory rather than institutional blame. In post-war Japan, policy failures in industrial targeting were common, sometimes costly. What mattered was not the failure itself, but whether it generated insight that informed subsequent action. The same official could preside over an unsuccessful sectoral bet and still advance, provided the reasoning was sound and the learning explicit. Career trajectories were shaped by judgement under uncertainty, not by the absence of error.

16.98. Authoritarian systems have achieved learning through a different route: political insulation rather than institutional forgiveness. Local experimentation is encouraged,

failure tolerated, and success rapidly scaled — so long as political red lines are respected. This model produces speed, but at the cost of transparency and often at the risk of hidden fragilities. It is not transferable to a democratic, legalistic polity like India. But it underscores a crucial point: learning is never free; it is merely paid for differently.

16.99. For democracies, the price of learning must be paid through institutional design rather than political discretion. This requires a deliberate architecture of forgiveness. Such an architecture begins with how failure is viewed. Not every adverse outcome is a failure of intent or competence. Some are failures of hypotheses. Others are failures of timing. Still others are failures of coordination. Equally important is the temporal dimension of accountability. Ex ante clarity and ex post proportionality matter more than real-time scrutiny. This may require an explicit re-orientation of the approach of agencies like the Comptroller & Auditor General and of Vigilance systems. It will also need an appropriate balance in laws relating to the prosecution of public servants.

16.100. For India to have the entrepreneurial state it sorely needs, honest officials must be protected from vexatious prosecution. Where a complex regulatory or economic decision is being alleged to be ill-motivated but without clear evidence of quid pro quo, the answer is difficult. The law will need to weigh this without making economic decision-making risk-averse.

16.101. In the decades ahead, India will face decisions for which there are no manuals. In each case, outcomes will depend less on the correctness of initial choices and more on the State's capacity to learn, revise, and act with confidence under uncertainty.

#### Box XVI.5: The RTI Act: Transparency without Blindness

The Right To Information (RTI) Act, 2005, is widely seen as one of India's most powerful democratic reforms. The RTI Act is first and foremost an anti-corruption and accountability instrument, and its contribution to democratic governance is beyond dispute. It empowered citizens to demand answers, lifted the veil of administrative secrecy, and gave ordinary people a tool to challenge corruption. Yet, like any powerful instrument, it carries risks. Unless carefully balanced, RTI risks becoming an end in itself, with disclosure celebrated regardless of its contribution to better governance. That may undermine the very purpose it was meant to serve. It must be reiterated, however, that any re-examination must preserve its central role as an accountability instrument, while refining its operation in narrowly defined areas of internal deliberation.

The idea of citizens' right to know is not uniquely Indian. Sweden pioneered it with the world's first Freedom of Information Law (FOIA) in 1766. The United States enacted its FOIA in 1966, and the United Kingdom followed in 2000. Interestingly, former UK Prime Minister Tony Blair later admitted he regretted introducing it, not because he opposed accountability, but because he felt governance itself suffered: "*You can't run a*

*government without being able to have confidential discussions with people on issues of profound importance.”* The UK House of Commons Justice Committee (2012–13) reached a similar conclusion, urging wider use of exemptions to protect candid internal debate. The global experience suggests that transparency works best when paired with room for candid discussion.

By global standards, India’s RTI Act is relatively expansive. In the United States, internal personnel rules, inter-agency memos, and financial regulation reports are exempt from disclosure. Sweden protects fiscal and monetary policy, supervisory activities, and the economic interests of institutions under its secrecy provisions. The United Kingdom exempts policy formulation where disclosure may harm the public interest, with ministers retaining veto powers even against orders of courts or commissions. The World Bank similarly excludes deliberative information and administrative matters from its disclosure policy.

India, in contrast, leaves far less space for such carve-outs. Draft notes, internal correspondence, and even personal records of officials often enter the public domain, sometimes even where the link to public interest is weak. Unlike the United States, the United Kingdom, or South Africa, which explicitly shield policy deliberations and draft documents, India has no general “deliberative process” exemption. File notings, internal opinions, and draft notes fall squarely within the Act’s definition of information, with only Cabinet papers protected temporarily until a decision is made. Combined with a strong public-interest override that can compel disclosure even of exempt material, this makes India’s RTI regime particularly broad. The challenge now is to preserve this openness while also retaining space for candid and effective decision-making.

### **The Law of Unintended Consequences**

The concern is predictable: if every draft or remark might be disclosed, officials may hold back, resorting instead to cautious language and fewer bold ideas. The candour needed for effective governance is blunted. This is not an argument for secrecy by default. Rather, democracy functions best when officials can deliberate freely and are then held accountable for the decisions they finally endorse, not for every half-formed thought expressed along the way.

Indian courts have already recognised these boundaries. In *Girish Ramchandra Deshpande v. CIC* (2013), the Supreme Court exempted personal records of public servants from disclosure. In *R.K. Jain v. Union of India* (2013), the Court shielded Annual Confidential Reports. More recently, in *Canara Bank v. C.S. Shyam* (2017), it reaffirmed that employee data cannot be disclosed unless an overriding public interest is established. These rulings affirm that privacy and confidentiality complement democracy rather than weaken it.

### **A Case for Re-Examination**

Nearly two decades on, the RTI Act may need re-examination, not to dilute its spirit, but to align it with global best practices, incorporate evolving lessons, and keep it firmly anchored to its original intent. A few possible adjustments may be worth exploring. One could be to exempt brainstorming notes, working papers, and draft comments until they form part of the final record of decision-making. Another option could be to protect service records,

transfers, and confidential staff reports from casual requests that add little value to the public interest. A third might be to explore a narrowly defined ministerial veto, subject to parliamentary oversight, to guard against disclosures that could unduly constrain governance. These are not prescriptions, but suggestions worth debating to ensure that the Act remains effective while also safeguarding the integrity of decision-making.

The RTI Act was never intended as a tool for idle curiosity, nor as a mechanism to micromanage government from the outside. Its purpose is far higher, and the law itself makes that clear. The Act seeks “to promote transparency and accountability in the working of every public authority” and “to contain corruption and to enhance the people’s participation in the democratic process.”

The Act is best understood not as an end in itself, but as a means to strengthen democracy. The wiser path is to keep it anchored to this original aim: enabling citizens to demand accountability for decisions that affect them, while also ensuring that space for candid deliberation and respect for privacy remain protected. That balance between openness and candour is what will keep the RTI Act true to its purpose.

### **Organisational design and the burden of governance – Capacity depends on how responsibilities and ownership are organised.**

16.102. The ability of the State to learn, correct course, and act with confidence under uncertainty ultimately depends on how responsibilities, authority, and ownership are organised within its institutions. As organisations expand in scale and their responsibilities become more complex, the weight placed on inherited functional structures tends to increase faster than their capacity to deliver outcomes. In such environments, challenges arise not merely from resource constraints or managerial effort, but also from the architecture that organises responsibilities, authority, learning, and execution. Traditional function-based structures serve important purposes by concentrating expertise and preserving professional depth, yet they often locate multiple, sometimes competing, roles within the same organisational boundaries. When regulatory, developmental, operational, supervisory, and coordination tasks coexist inside the same units, managerial attention is stretched, and priorities become blurred. At the same time, outcomes increasingly depend on collaboration across semi-autonomous units, delivery systems, geographic footprints, and external partners. This disperses accountability and weakens feedback loops unless organisational design evolves in parallel with mission complexity.

16.103. In both public and private institutional contexts, effectiveness improves when structures are organised around clearly articulated missions and outcomes with explicit objectives and time horizons, rather than being anchored solely to permanent functional mandates. This is fundamentally a design challenge rather than a behavioural one. Capability is not strengthened by exhortation alone; it depends on whether roles that conflict are separated, whether mission-oriented structures are created where

objectives are interdependent, and whether continuity is protected in posts where institutional memory and learning curves make a material difference to performance. Ultimately, capability is tested in execution, and even sound strategies falter when responsibilities are fragmented and when no clearly identifiable locus of ownership exists for the outcomes the organisation seeks to achieve.

16.104. The question of ownership and accountability arises with particular force in cluster-based and mission-oriented structures. Cluster arrangements can improve coherence by grouping related domains around shared strategic purposes, yet they risk becoming merely forums for consultation if responsibility is diffused too widely. More robust designs distinguish between shared contribution and clearly assigned ownership of outcomes. In such architectures, the cluster lead assumes ownership of the outcome. It is responsible for defining priorities, sequencing actions, reconciling trade-offs, and reporting on progress. At the same time, the participating units retain control over their instruments and resources and operate within an outcome-anchored performance frame. Responsibility for actions may be distributed, but accountability for outcomes is located, visible, and reviewable.

16.105. The logic underpinning these arrangements has close parallels in the evolution of large private-sector organisations as they have grown across product lines, geographies, and technologies. Firms that began with strongly functional structures often found that functional excellence did not automatically translate into enterprise-level performance once they diversified or internationalised. As product portfolios widened and regional operations multiplied, coordination costs rose, and conflicts of priority emerged between specialist functions that continued to optimise for their own domains. In response, many organisations shifted toward divisional, business-unit, or matrix designs that retained functional expertise. At the same time, product, market, or regional leadership was added to oversee end-to-end outcomes. In such systems, business-unit or regional heads assumed ownership of results for their domains, while cross-cutting missions such as digital transformation, operational resilience, or sustainability transition were sponsored at the senior executive level and implemented through dedicated, mission-oriented structures that cut across functions and territories.

16.106. These private-sector trajectories highlight design lessons that resonate in public and quasi-public systems. First, as organisations become multi-mandate or multi-domain systems, purely functional structures struggle to manage interdependence because they lack a natural locus for integrating objectives and brokered trade-offs. Second, coordination mechanisms are effective only when coupled with recognisable centres of outcome ownership that possess the authority and informational vantage point required to align contributors toward a shared objective. In both sectors, the challenge is not simply to coordinate activities, but to ensure that coordination is

embedded within an accountability architecture that makes outcome responsibility visible and actionable.

16.107. Public-sector organisations often face an additional layer of complexity because policy, regulatory, and implementation responsibilities coexist with inter-organisational and inter-jurisdictional collaboration. Cluster and mission-oriented approaches can play a role here by providing institutional stability, domain depth, and continuity on the one hand, and direction, prioritisation, and outcome focus on the other. The central coordinating entity functions most effectively when it acts as an enabling and integrative platform that aligns incentives, resolves conflicts across missions, strengthens monitoring and learning, and prevents both excessive centralisation and unproductive diffusion of authority, rather than as a substitute for specialised structures.

16.108. In both public and private contexts, therefore, mature organisational design entails a dynamic balance between functional depth, mission or cluster alignment, and explicit outcome ownership. Functional structures preserve expertise and professional capabilities, while mission-oriented or clustered arrangements align related mandates around shared purposes. Clearly identified outcome owners ensure that results have a clearly accountable centre of gravity. When these elements are aligned, organisational performance becomes less dependent on informal coordination or individual effort and more grounded in institutional capability, learning, and intent. By progressively aligning structures with the goals they are intended to serve, organisations operating in complex environments are better able to adapt to interdependence while preserving clarity of purpose and integrity of execution.

16.109. In India's federal structure, States pursue capacity building and policy objectives through different institutional arrangements, reflecting differences in history, administrative capacity, and development priorities. What is common across States, however, is a growing recognition of the importance of organisational design and clear outcome ownership in delivering results. These initiatives, in their different forms, are all means directed towards the larger end of strengthening state capacity.

16.110. The State Support Mission of NITI Aayog represents one such example of how these principles are being put into practice to strengthen cooperative federalism and state capacity. (Box XVI.6).

**Box XVI.6: Developed States for *Viksit Bharat@2047*: Strengthening Cooperative Federalism through State Support Mission**

The State **Support Mission (SSM)** of NITI Aayog is a flagship initiative of NITI Aayog to operationalise its core mandate of strengthening cooperative federalism and advancing the shared national vision of ***Viksit Bharat@2047***.

Recognising that States/UTs follow diverse pathways for development and the requirement for an agile, forward-looking institutional framework to steer the scale of transformation required, the SSM focuses on institutional strengthening, capacity building, fostering innovation, promoting cross-state learning, dissemination of best practices, and leveraging knowledge institutions to support evidence-based policymaking and strategic development planning.

A central pillar of the Mission is the establishment of State Institutions for Transformation (SITs), envisioned as State-level think tanks that provide continuity in long-term visioning, strategic reforms, evidence-based policymaking, and enhance implementation capacity. States and UTs are encouraged to either establish dedicated SITs or reimagine and strengthen existing Planning Departments/Boards/Commissions to perform these functions.

As of date, 32 States and UTs have established SITs. These include, among others, the Gujarat State Institution for Transformation (GRIT), Maharashtra Institution for Transformation (MITRA), State Institute for Empowering and Transforming Uttarakhand (SETU Aayog) and the Tripura Institution for Transformation (TIFT). Further, 26 States and UTs have also partnered with Knowledge Institutions (LKIs) such as IITs, IIMs, and leading Central and State Universities, by leveraging the technical, analytical, and sectoral expertise of these institutions to support State-led reforms.

The Mission has encouraged States and UTs to articulate **long-term development visions**, and integrate advanced analytics and domain expertise into their sectoral strategies.

The SSM has also supported States and UTs in strengthening **Monitoring and Evaluation (M&E) frameworks**, addressing high-priority information needs and enabling **data-driven governance**. The **NITI for States (NFS) Knowledge Platform** has reduced information asymmetry by offering a single-window repository of best practices, policies, datasets, and knowledge products to inform decision-making.

Overall, the State Support Mission is empowering every State and UT to evolve into a **Developed State**, to contribute to building a **Viksit Bharat**. Seen in this light, the State Support Mission can be viewed as an institutional effort to support state capacity.

## State Capability as a Human System: Culture, Skills, and Execution (Mission Karmayogi)

संगच्छद्वं संवदद्वं सं वो मनांसि जानताम् ।  
देवा भागं यथा पूर्वे सञ्जानाना उपासते ॥

*Move together, speak together, and let your minds be aligned.*

*Just as those before acted in shared understanding to pursue a common purpose.*

–Rig Veda, Mandala 10, Sukta 191, Verse 2

16.111. Institutional arrangements such as mission-oriented coordination platforms and state-level transformation units can create the architecture for collective action, but their effectiveness ultimately depends on how they are inhabited and exercised

in practice. States act through institutions, and institutions, in turn, act through individuals. As policy challenges become more complex, technology-driven, and expectation-intensive, the quality of public outcomes increasingly depends on how civil servants interpret roles, exercise judgment, and engage with citizens. State capability, in this sense, is not only a function of formal structures or procedures, but also of the human systems through which public authority is exercised in practice.

16.112. India's administrative system carries the imprint of its historical origins. Designed initially for command, compliance, and hierarchy, it prioritised order and control. Over time, democratic deepening and developmental expansion extended this administrative architecture into domains it was not originally designed to serve, enabling delivery at scale but also shaping interactions between policymakers and citizens through procedures and rules. As a result, governance has often been experienced as rule-bound and impersonal, reflecting inherited structures more than contemporary intent. Yet in everyday life, citizens increasingly expect the State to be accessible, responsive, and fair.

16.113. At the same time, India is witnessing the strengthening of a participatory ethos through *Jan Bhagidari*, reflecting a shift towards governing with citizens as partners in public outcomes. This orientation aligns with the broader national vision of *Sabka Saath, Sabka Vikas, Sabka Vishwas, Sabka Prayas*, which emphasises partnership, development, trust, and collective effort, and is reinforced by ideas such as *Nagrik Devo Bhava* and *Antyodaya*, which place respect, empathy, and fairness at the centre of public service. Mission *Karmayogi*, implemented through the Capacity Building Commission, plays a critical role in shaping bureaucratic culture towards citizen-centric service by emphasising not only what civil servants do, but how they engage with citizens and how feedback from these interactions informs institutional learning.<sup>3</sup>

16.114. As economies move to higher levels of development, the challenge for public administration is no longer only to expand capacity, but to repurpose the idea of service itself. Modern governance increasingly requires systems that can learn, adapt, and absorb change rather than merely comply with static rules. Large organisations, including governments, evolve more effectively when reform is treated as a process of absorption rather than disruption. Incremental learning, role clarity, and the gradual internalisation of new practices enable durable change, whereas abrupt or purely structural interventions often provoke resistance.<sup>4</sup>

16.115. Depth in analytical and administrative support, along with systems that enable coordination, analysis, and follow-through, significantly increases the likelihood of

3 Dr. R Balasubramaniam. The Statesman. 13 November 2025. Citizen and the State. <https://tinyurl.com/bddp929v>

4 Dr. R Balasubramaniam. The Statesman. 23 October 2025. Repurposing service. <https://tinyurl.com/5xeydbz2>

successful execution. Strengthening state capability, therefore, involves investing in high-quality teams, improving the skills and continuity of supporting staff, and ensuring that specialised analytical and technical functions are adequately resourced alongside general administrative roles.

16.116. As governance challenges become more project-oriented and time-bound, execution also benefits from flexibility in team formation. Enabling senior officials to assemble teams around clearly defined objectives improves focus and accountability, particularly for complex initiatives. Supplementing core administrative capacity with young professionals and domain specialists adds analytical depth, fresh perspective, and speed, especially in purpose-driven and time-bound goals. Over the medium term, recruitment strategies and skill profiles matter for sustaining such capability, as administrative systems perform best when the breadth of perspective is complemented by functional competence.

16.117. Rapid technological change is also transforming the nature of work within government itself. While automation and artificial intelligence can improve efficiency, the future of governance increasingly depends on distinctly human capabilities, including judgment, ethical reasoning, collaboration, and systems thinking. Mission *Karmayogi* reflects this shift by moving away from rigid role definitions towards dynamic capability frameworks that align individuals with evolving functional needs. By embedding continuous learning, competency mapping, and domain-specific capacity building within the civil services, the programme recognises that effective execution in complex environments depends not only on technology adoption, but on how officials interpret responsibility, manage uncertainty, and exercise discretion in real-world settings.<sup>5</sup>

16.118. A distinctive feature of Mission *Karmayogi* lies in its explicit grounding in values drawn from India's civilisational traditions. Effective reform in the Indian context must combine modern administrative practices with ethical anchors that emphasise duty, service, and collective purpose. The mission's guiding principles—development, pride in service, duty, and unity—along with personal virtues such as self-reflection, collaboration, and citizen-centric purpose, position public service as a vocation rather than a transactional role. This approach underscores an Indian pathway to reform, where institutional change is sustained not only through formal rules and incentives, but through internalised values that shape behaviour over time. In doing so, Mission *Karmayogi* seeks to strengthen state capability by aligning professional identity with public purpose and reinforcing trust between institutions and citizens.<sup>6</sup>

---

5 Dr. R Balasubramaniam. The Statesman. 30 July 2025. Strategic humanisation. <https://tinyurl.com/ynwvzm7j>

6 Dr. R Balasubramaniam. The Statesman. 28 August 2025. An Indian Way. <https://tinyurl.com/3swwyyp>

## The Regulatory State as a Core Component of State Capacity

16.119. Regulation is one of the most consequential interfaces between the state and the economy. Regulators provide public goods in the public interest by protecting consumers, enabling market development, and enforcing rules. In doing so, they exercise powers—legislative, executive, and judicial—that closely resemble those of the Government itself. Governance through regulators offers clear advantages: specialisation, continuity, and insulation from day-to-day political pressures. At the same time, it raises significant concerns about accountability, the concentration of authority, and procedural fairness. The central challenge is therefore to minimise these risks while preserving the strengths of the regulatory form. Given the complex agency relationships involved, the design and placement of regulators must be anchored within a coherent vision of public interest rather than treated as ad hoc institutional solutions.

16.120. In practice, regulators operate as mini-states within their domains, simultaneously exercising quasi-legislative, executive, and quasi-judicial powers. Frequently, the same individuals or internal divisions perform multiple roles such as lawmaker, investigator, and judge, without clear procedural separation. There is nothing inherently inappropriate about regulators exercising these powers, as modern, complex markets require strong and responsive institutions. However, when power is concentrated without adequate internal checks, credibility suffers.

16.121. Therefore, regulatory capacity is a question of institutional design as much as it is of intent or effort, spanning rule-making, enforcement, accountability, and the structuring of delegated authority as discussed in Box XVI.7.

### Box XVI.7: Regulatory Capacity as Institutional Design

Regulatory capacity depends on how formal powers granted to regulators are structured, exercised, and constrained through institutional design. Some important considerations are discussed in the following institutional design choices:

#### Clarity in rulemaking and guidance

In many regulatory systems, the volume of circulars, guidelines, and master directions exceeds the parent statute, creating uncertainty and diluting the authority of the parent regulation. When subsidiary instructions begin to substitute for regulation, the boundary between law and administration becomes blurred, complicating compliance. Regulatory frameworks should, therefore, clearly distinguish between regulations and subordinate guidance. Substantive rulemaking must follow transparent processes, including publication of draft regulations, public consultation, and disclosure of responses, and should rest with

the governing board. Subsidiary instructions should remain confined to clarificatory and procedural matters, subject to internal discipline and periodic review.<sup>7</sup>

### **Separation within authority**

Regulators often exercise quasi-legislative, executive, and quasi-judicial powers within the same institution. This reflects the complexity of modern markets and is not inherently problematic. However, it places a premium on internal separation and discipline.

### **Regulatory boards that anchor accountability**

The effectiveness of regulatory institutions depends on their governing boards that act as principals, holding executive management accountable while exercising independent judgement on policy and enforcement. Board composition plays a critical role in this regard. The presence of independent and part-time members brings external perspective, professional diversity, and detachment from day-to-day operations. This enables boards to shape decisions rather than merely endorse managerial outcomes. Balanced representation across relevant disciplines, including law, economics, and market expertise, strengthens deliberation and institutional oversight. Institutional independence is further supported through fixed tenures, eligibility criteria, safeguards against arbitrary removal, and post-tenure restrictions.<sup>8</sup>

### **Proportionality and discipline in enforcement**

Regulatory capacity is tested in enforcement. If sanctions are imposed without regard to intent, scale, duration, or harm, enforcement risks becoming checkbox compliance rather than advancing regulatory objectives. A robust enforcement architecture, therefore, requires proportionality to be embedded in institutional design. Proceedings should culminate in a single, reasoned determination of contravention, enabling calibrated use of penalties, disgorgement, remedial directions, or suspensions based on clearly articulated aggravating and mitigating factors. Interim measures should remain preventive, time-bound, and subject to safeguards.

### **Due process as an operational norm**

As regulators exercise powers analogous to those of a civil court, procedural fairness becomes an essential component of regulatory capacity. Capacity is weakened when enforcement proceeds without full disclosure of material relied upon or when adjudicatory outcomes are inadequately reasoned.

### **Democratic anchoring and transparency**

Regulatory autonomy without democratic anchoring risks eroding trust. Regulatory capacity, therefore, depends not only on expertise and independence, but also on transparency and

7 M S Sahoo and V Anantha Nageswaran. Business Standard. The Securities Markets Code: Regulatory Governance, Finally Codified. <https://tinyurl.com/nhk54bnj>

8 M S Sahoo and V Anantha Nageswaran. Business Standard. Regulatory architecture 2.0: Securities Markets Code marks a decisive shift. <https://tinyurl.com/3d3nhjem>

accountability to representative institutions. Statutory publication of regulations, subsidiary instructions, enforcement orders, and governance decisions, along with parliamentary laying and periodic review, situates regulatory action within a democratic framework while preserving operational independence.

### **Delegated regulatory capacity within a principal-agent hierarchy**

Modern regulatory systems operate through layered delegation rather than direct command. As analysed by Braun and Gilardi,<sup>9</sup> democratic governance functions as a chain of principal-agent relationships, beginning with citizens and extending through legislatures, the executive, and specialised regulatory institutions. Each step in this chain involves a transfer of authority accompanied by risks of agency loss, making institutional design, constraints on discretion, and oversight mechanisms central to regulatory capacity. Regulatory effectiveness depends on how delegation is bounded, monitored, and overseen. Recent statutory experience under the Securities Markets Code, 2025, illustrates this approach by empowering market infrastructure institutions as statutory actors, while subjecting delegated authority to due process, transparency, and parliamentary oversight.<sup>10</sup> In this context, Chapter 3 (Box III.6) offers a detailed discussion of the Securities Markets Code, 2025.

## **Building Regulatory Capacity - School for Regulations**

16.122. A significant gap persists in the availability of human resources capable of ensuring the efficient functioning of a market economy. While academic institutions have tailored traditional courses in law, economics, accounting, and management to address the demands of a market economy, a dedicated, comprehensive, and structured programme aimed at building regulatory capacity remains elusive. Consequently, regulators and businesses rely on professionals trained in conventional disciplines, often requiring extensive adaptation.

16.123. Regulators need experts capable of balancing freedom with oversight, while businesses require professionals who can harness this freedom to drive growth while adhering to regulations. With the right talent in place, regulators, businesses, and professional firms could better appreciate each other's perspectives, fostering collaboration and significantly improving the overall ease of doing business. This calls for an institutional arrangement that cultivates a cadre of professionals adept in regulatory design and implementation to improve the ease of doing business. Schools of Regulatory Studies could be established either as new stand-alone institutions or as additions to existing institutions.

<sup>9</sup> Braun, D., & Gilardi, F. (Eds.). (2006). Delegation in contemporary democracies. London: Routledge. <https://tinyurl.com/5n6h4atz>

<sup>10</sup> M S Sahoo and V Anantha Nageswaran. Business Standard. When market infrastructure institutions start becoming the state. <https://tinyurl.com/7nmnhprd>

## Responsible Regulation

16.124. The recruitment process for full-time members of regulatory agencies and tribunals has predominantly drawn upon candidates with prior experience in government, particularly those with long tenures in public administration. At the same time, to build sustained expertise, regulators and regulatory tribunals should attract professionals at a younger age to pursue dedicated careers. Regardless of the age at which they join, appointees should serve until the standard retirement age for government service. This would ensure a steady infusion of expertise and independence, equipping these institutions to meet the demand.

16.125. State authorities operate through layered hierarchies, where each level can revisit and revise the decisions of the level below, even after implementation. Crucially, such revisions occur without any institutional accountability for the disruption caused. Each authority can afford to be wrong, repeatedly, without consequences. This asymmetry undermines the integrity of the resolution process. If regulated entities must act decisively and face the consequences of their actions, why should state authorities not be subject to similar standards of responsibility and finality? If business decisions can be made in one go, there is no reason state approvals cannot be the same.

16.126. The interests of business and the economy demand certainty in commercial transactions. These should, at most, require approval by a single designated authority. Once granted, such approval should be final. Of course, finality of approval pertains to transactional certainty, not to immunity from investigation, sanction, or corrective action where fraud, misrepresentation, environmental harm, or violation of law is subsequently established. This principle must form the bedrock of all economic regulatory frameworks. Rigorous oversight is essential to deter misconduct and hold wrongdoers accountable. However, such oversight must be disentangled from the validity of commercial transactions once they have been lawfully approved or deemed approved. A streamlined, single-tier approval process, coupled with institutional accountability for any lapses, is essential for an economy aspiring to be a developed country.

16.127. Most regulatory processes, including approvals, investigations, enforcement actions, disputes, and appeals, are driven by money. Delays, therefore, impose real economic costs. To address this, decisions must be subject to strict timelines, with provisions for deemed approvals when authorities fail to act within prescribed periods. Under the Competition (Amendment) Act, 2023, the Competition Commission of India (CCI) now operates with shorter statutory review timelines for mergers and combinations. The overall review period has been reduced from 210 to 150 calendar days, and the CCI is required to form a preliminary (*prima facie*) opinion within 30 calendar days of notice. This amendment, which deems combinations approved if not decided within a fixed timeframe, provides a useful precedent.

16.128. Economic laws should specify timelines for every stage of regulatory action, with consequences for non-compliance. Just as obstructing a public servant is penalised, failure by authorities to deliver services within mandated timelines should be treated as an obstruction to economic activity. Moving from discretionary, open-ended processes to enforceable deadlines is essential for embedding respect for the time value of money within the regulatory system.

16.129. Having examined the institutional design and accountability of the regulatory state, it is equally necessary to examine how private economic actors respond to, and shape, this institutional environment.

### **The Private Corporate Sector and Nation-Building**

16.130. Even a well-designed regulatory architecture cannot generate state capacity in isolation. Regulatory institutions operate within a broader political-economic equilibrium shaped not only by law and administration, but by the behaviour of the actors they regulate. In India, the private corporate sector is not merely a subject of regulation; it is a structural participant in the incentive environment that determines whether the state upgrades its capacity or governs through discretion.

16.131. The large Indian corporate sector occupies an intermediate position between two historical archetypes. It has not functioned as a developmental partner to the state in the manner seen in late-industrialising East Asia, where firms actively demanded state competence and discipline. Nor has it behaved like the arm's-length, rules-bound corporate sector typical of mature Western economies. Instead, it operates in a hybrid zone where rents are available, enforcement is uneven, and political mediation substitutes for market discipline. Three structural characteristics define this equilibrium.

16.132. First, there is a relative lack of willingness and appetite to invest efforts towards long-term risk absorption and becoming globally competitive. Regulatory arbitrage, protected margins, and firm-specific accommodations often dominate productivity enhancement, scale competition, or learning-by-doing. This preference is rational in an environment where downside risks are socialised through bailouts, banking forbearance, tariff protection, or retrospective renegotiation. A corporate sector that externalises risk to the state does not exert pressure for higher state capacity; instead, it generates demand for discretion. Discretion, in turn, corrodes rule-based institutions.

16.133. Second, capital allocation horizons remain short. Despite notable exceptions, Indian corporate investment is characterised by low R&D intensity, caution in frontier manufacturing, and concentration in real estate-linked, regulated, or quasi-monopolistic sectors. This reflects not merely culture, but governance structures—family

control, succession orientation, weak managerial labour markets, and underdeveloped long-horizon capital. When firms do not require fast courts, skilled labour at scale, or predictable regulation to generate returns, they cannot function as a forcing mechanism for institutional upgrading. Comparative experience shows that corporates induce state upgrading only under specific conditions, when productivity is the sole path to survival (See Box XVI.8).

#### Box XVI.8: Profit, Capability and National Purpose: International Precedents

The historical record provides numerous instances where business leaders and firms acted not merely as profit-seeking entities but as institutional partners in broader national projects, particularly during periods of reconstruction or strategic transformation.

In post-war America, the corporate sector internalised a nation-building role in two overlapping arenas: reconstruction abroad and technology-industrial leadership at home. Large manufacturers such as General Motors, Ford, and Caterpillar were not only rebuilding their balance sheets but also supplying machinery, vehicles, and industrial equipment that underwrote the Marshall Plan's reconstruction of Europe.

Their participation was commercially profitable, yet it simultaneously advanced an explicit American objective of stabilising allies, rebuilding markets, and containing communism. The post-war research orientation of companies such as Bell Labs, IBM, and RCA similarly reflected a fusion of corporate strategy and national purpose. Investment in semiconductors, computing, communications, and aerospace served the Cold War technological race but also generated foundational public goods in science and engineering. Senior executives frequently framed these choices in civic language — as duties to “national strength” and “modernisation” — and willingly accepted long investment horizons and collaboration with universities and federal laboratories. The American private sector's role in the interstate highway system, defence contracting, and space exploration likewise married commercial incentives with a shared understanding that corporate capacity was an instrument of national modernity and geopolitical credibility.

West Germany's story after 1945 illustrates a different but related ethic. The rebuilding of German industry occurred in a context where corporate leaders explicitly embraced “*Soziale Marktwirtschaft*,” the social market economy, as a moral and national settlement. Firms such as Siemens, BASF, and Volkswagen operated under strong expectations of codetermination, vocational training, and wage-productivity bargains that supported social stability and rapid reconstruction. Their export orientation was not presented as narrow profit maximisation but as a route to restoring Germany's legitimacy, rebuilding employment, and anchoring the country within Europe. Business federations worked closely with regional banks and the *Mittelstand*, accepting constraints on price behaviour and capital allocation to sustain production, apprenticeships, and technological upgrading. In effect, the private sector absorbed part of the burden of national rehabilitation, treating competitiveness and social cohesion as mutually reinforcing obligations.

Japan's post-war industrialisation offers another powerful example of how private enterprise internalised national purpose. Major firms organised within keiretsu groupings pursued profits, but they also accepted coordinated investment, export discipline, and technology-acquisition strategies aligned with national upgrading ambitions. Companies such as Toyota, Sony, and Nippon Steel invested heavily in process quality, productivity, and engineering even when short-term returns were uncertain. Corporate leaders publicly cast these choices as contributions to Japan's recovery and international standing, and there was a strong cultural framing of the firm as a national institution rather than merely a private property. The "catch-up" imperative created a moral economy in which managerial prestige was tied to moving the nation up the technological ladder, not simply to dividend payouts. Even intense domestic competition operated within this shared horizon of national advancement.

The later East Asian experiences in Korea, Taiwan, and Singapore similarly reveal business traditions that bound private gain to national transformation. In Korea, the rise of the chaebol — Samsung, Hyundai, LG — is often described in terms of state guidance. Still, it is equally a story of corporate elites internalising an export-national mission. These firms took on highly leveraged investments, diversified into technologically demanding industries, and accepted exposure to international competition as proof of national capability. Senior leadership routinely articulated performance in terms of patriotic achievement, and internal cultures emphasised sacrifice, discipline, and organisational loyalty as national virtues. Profitability remained essential, but prestige was derived from elevating Korea's industrial status and earning foreign exchange for the country.

Taiwan offers a contrasting but complementary pattern. Its industrialisation was powered less by conglomerates and more by dense networks of small and medium-sized firms embedded in local communities and global supply chains. These enterprises frequently reinvested surpluses in skills, machinery, and export learning, and treated participation in the island's transformation as a civic project. Business associations coordinated standards, technology diffusion, and supplier upgrading in ways that strengthened collective competitiveness rather than merely protecting individual margins. The private sector thus functioned as the backbone of a wider developmental coalition, with entrepreneurial success imagined as a contribution to national resilience and external security.

Singapore's case highlights yet another modality of alignment between corporate strategy and national interest. Private firms operated alongside government-linked companies and sovereign investment arms, but many domestic and multinational enterprises internalised the city-state's ethos of excellence, reliability, and global trustworthiness. Businesses adopted rigorous standards, workforce development, and long-term investments in logistics, finance, and advanced manufacturing because these were understood to serve not only corporate interests but also Singapore's reputation and survival as a small, trade-dependent nation. Corporate leaders often spoke in the idiom of stewardship: firms were expected to be custodians of national credibility in global markets, and commercial behaviour was evaluated accordingly.

Across these very different contexts, what stands out is not uniform policy design but a shared moral framing of enterprise. Business leaders viewed their firms as institutions embedded in a national project, and willingly accepted constraints, risks, or long-term horizons when these advanced collective goals, such as reconstruction, technological upgrading, export capability, social stability, or geopolitical standing. Profit and national interest were not seen as antagonists to be reconciled after the fact, but as dimensions of the same vocation.

National transformation is most durable when business leaders see themselves not merely as beneficiaries of growth but as trustees of a larger developmental project. The most successful corporate histories in post-war America, Germany, Japan, and East Asia were marked by firms that invested ahead of immediate returns, treated technological capability and workforce upgrading as civic obligations, and derived legitimacy from strengthening national resilience, enhancing export competitiveness, and promoting social stability. Their pursuit of profit was not suspended; rather, it was embedded within a moral economy in which reputation, prestige, and long-term value were tied to advancing national capability rather than extracting short-term gains. The underlying ethic was one of stewardship: firms imagined themselves as institutions of the nation, not just participants in its markets.

For India, this implies a private sector that is willing to accept longer investment horizons in innovation, skills, and quality; one that treats formalisation, productivity, and technological deepening as collective goods rather than optional strategies; and one that recognises its role in shaping social trust and institutional credibility. It calls for business leadership that is comfortable with competition at global standards, that reinvests success into capability building rather than financial engineering, and that frames corporate ambition in terms of what it does for India's productive base, employment quality and international standing. In a society undergoing rapid structural change, the private sector's legitimacy will increasingly rest on its ability to marry commercial dynamism with a conscious contribution to nation-building, not as a slogan, but as a guiding discipline in strategy, capital allocation and organisational culture.

16.134. Third, political economy experience shows that when firms cannot rely on protection, discretion, or rent extraction and must compete on productivity, quality, and export performance, they develop a direct interest in strong, predictable, and impartial public institutions. In this sense, productive firms can act as a forcing mechanism for higher state capacity.

16.135. Yet, state capacity is not shaped by firms alone. Public institutions ultimately operate through everyday interactions with individuals and households, whose compliance behaviour, expectations of fairness, and willingness to engage with formal systems are equally decisive. The private sector, therefore, must be understood not only as a collection of enterprises, but also as a society of citizens. It is to this broader societal role in achieving *Viksit Bharat* that we now turn.

## Citizens, norms, and the social foundations of capability

16.136. If the private corporate sector co-shapes the incentive environment in which state capacity evolves, citizens shape it even more pervasively through the daily norms that determine whether public systems must rely on enforcement or can function through internalised responsibility.

16.137. The Indian state today operates under intense pressure: to deliver growth, manage distributional conflict, maintain macroeconomic stability, absorb geopolitical shocks, and prepare for technological disruption, all while operating within democratic, judicial, and media constraints. In such an environment, the cost of enforcement rises sharply. Every rule that must be policed rather than internalised, every policy that must be coerced rather than complied with, every reform that is litigated socially before it is debated intellectually, consumes scarce administrative bandwidth. This is where the behaviour of citizens, often treated as a secondary or moral question, becomes a primary variable in political economy.

16.138. In a world that is changing faster than most people can fully process, the role of citizens is no longer limited to voting, paying taxes, or following rules. It shows up in the way people live their daily lives, how they learn, how they treat their work, how they care for their bodies and minds, how they handle disappointment, and how they think about the future of their children. Development, in that sense, is not something that happens “out there”, in ministries and boardrooms; it happens in homes, neighbourhoods, workshops, offices, and factory floors, through the quiet habits people build every day.

16.139. Technology is bringing this reality closer to individuals than ever before. For years, people believed that as long as one had a degree and a “respectable” job, the world would not change too much around them. But artificial intelligence has unsettled that comfort. Many kinds of work that once felt secure, such as drafting emails, compiling reports, and processing information, can now be done faster by machines. This does not make people useless; it simply changes where human worth is expressed.

16.140. It shifts value toward things that depend on care, discipline, skill, and judgement, fixing a machine so that a line does not stop, handling a complex delivery schedule without chaos, building something with the hands and taking pride in its finish, working with others calmly when things go wrong. These are not “lesser” forms of work. They are the kinds of work on which reliability rests, and reliability is what allows large systems such as ports, highways, hospitals, power grids to function without constant breakdowns.

16.141. To thrive in such a world, people need to think of learning as a lifelong companion rather than a phase that ends with a certificate. That learning may not always come from

courses or formal training. It may come from listening to a younger colleague explain a new tool, from being willing to move into a different role, or from admitting that an old method is no longer the best. The humility to adapt without feeling diminished will be as important as raw intelligence.

16.142. But this transition is not only about skills. It is also about how people hold themselves together in an age that constantly pulls at their attention. Many lives today are lived through screens, constantly scrolling, reacting, and comparing. Over time, this drains energy, leaving people anxious, restless, and prone to anger. When that becomes the emotional climate of a society, it becomes increasingly difficult to sustain effort over extended periods. Work feels heavier, patience wears thin, and everything becomes urgent even when it is not.

16.143. Looking after one's physical health, protecting sleep, finding time for quiet or for exercise, learning to step away from social media before it consumes the day — these are not indulgences. They are forms of self-care that strengthen the ability to work steadily, to think clearly, and to respond with maturity rather than impulse. A society that values reliability must also value the inner stability that makes reliability possible.

16.144. This connects, in a deeper way, to how people think about comfort and sacrifice. Development always involves some trade-off between what feels good now and what pays off later. It may mean waiting at a red light even when the road appears empty, spending a little extra time to do a job properly instead of cutting corners, or accepting inconvenience when a city is being rebuilt. These may look like small inconveniences, but together they create an environment where systems run smoothly rather than constantly fight friction. Where people constantly negotiate rules or look for shortcuts, the state has to tighten enforcement, create more paperwork, and spend energy policing behaviour, which slows everything down and makes everything more frustrating for everyone.

16.145. In India, this tension is visible most sharply in the contrast between how people care for their private spaces and how they behave in the commons. Homes are often kept with great diligence, and personal hygiene and domestic order are observed with discipline and pride. Yet the ethic weakens once one steps outside the door. Streets, drains, railway tracks and vacant plots are treated as spaces without a custodian, and therefore without obligation. Other societies that have fared better on public hygiene, from Sri Lanka to parts of Africa and Latin America, have not produced more fastidious individuals inside their homes. They have raised the moral status of the commons to the level of the household. Public space is seen not as a zone of no responsibility but as an extension of shared life. Where that sensibility takes root, and where the state matches it with predictable collection, maintenance and civic services, behaviour shifts

from indifference to stewardship. The difference, in that sense, lies less in individual virtue than in whether collective spaces are experienced as worthy of care. Chapter 15 on urbanisation covered this issue in detail.

16.146. The same logic extends to public money. Handouts and freebies can be a compassionate gesture in the present, especially when people are struggling. But they are not paid by anybody. Much of the cost is pushed into the future through borrowing, and it is the next generation that must work longer and harder to repay it. In an emotional sense, this is easy to forget because the burden is invisible — no one sees the child who will one day pay the interest on today's promises. But the burden is real, and recognising it is part of what it means to act as responsible citizens rather than as short-term beneficiaries.

16.147. None of this is about asking people to become saints or to live lives of constant restraint. It is about recognising that the world India is entering is more competitive, more interconnected, and more technologically driven. It is also a world that rewards steadiness, skill, and maturity. A country cannot scale industries, logistics, or complex supply chains unless millions of people, across thousands of moments every day, show up on time, do their work with care, and hold themselves to standards even when no one is watching.

16.148. The deeper lesson is that capability in a society is co-produced. When citizens experience public systems as reliable, they are more willing to internalise norms of responsibility in shared spaces; when those norms take hold, the state spends less energy on policing and paperwork and more on solving problems that truly require authority and expertise. The commons is therefore not a peripheral arena but a quiet test of alignment between behaviour and institutions. Where private discipline coexists with public indifference, the machinery of the state is drawn into constant enforcement; where the ethic of care extends beyond the household into the civic realm, institutional capacity expands without the need for dramatic reforms or grand programmes. It is in this reciprocal strengthening — between how people live their everyday lives and how systems respond — that the foundations of durable capability are laid.

16.149. When citizens treat learning as a habit, respect physical and technical work, care for their own health and emotional balance, use technology without becoming captive to it, and understand that today's comfort can sometimes become tomorrow's burden, they do more than improve their own lives. They make the state's job easier, reduce the need for constant enforcement, and create the trust on which institutional capacity grows. In that quiet alignment between how people live and how systems function lies the real strength of a society that wants to rise without losing its balance.

## Delayed Gratification and the Cost of Impatience

16.150. Another recurring but underappreciated constraint on India's development trajectory is the difficulty of sustaining delayed gratification. Competing in the global big league, whether in manufacturing, logistics, institutions, or elite sports, requires incurring near-term costs for returns that are uncertain, delayed, and often invisible in the short term. Where *delayed gratification* weakens, systems begin to substitute shortcuts for capability, visibility for depth, and speed for learning.

16.151. A common misunderstanding is to treat “working smart” as the opposite of “working hard”. In practice, working smart is the *result* of working hard over time. Shortcuts are not discovered first and applied later; they are earned only after long exposure to detail, repetition, and error. One has to put in the hours before one can see which steps can be skipped. One has to learn the full complexity of a task before knowing which details truly matter. And one has to do the work wrong many times before discovering how to do it right. Delayed gratification is therefore not a moral virtue, but a productive capability.

16.152. Recent developments in Indian sport illustrate what happens when this sequence is inverted. Accelerated entry into professional leagues through short-format performance, limited competitive exposure, or social-media visibility has lowered entry barriers and expanded access. Yet it has also weakened the long apprenticeship that builds endurance, judgement, and technique. The costs are not immediately visible, but they accumulate quietly.

16.153. A related manifestation is the persistence of doping violations. Performance-enhancing substances offer immediate gains by bypassing the slow, disciplined work of training, recovery, and incremental improvement. While enforcement and testing matter, the deeper issue is behavioural. When delayed gratification breaks down, systems become vulnerable to shortcuts that deliver short-term results at the expense of long-term credibility. Trust and legitimacy collapse far faster than they can be rebuilt.

16.154. These tendencies are not confined to sport. They mirror everyday practices such as queue-jumping, informal compliance, unsafe construction, and negotiated enforcement that offer convenience to individuals while imposing diffuse and lasting costs on the system. An ‘India Today’ cover story from the late 1990s characterised the ‘Ugly Indian’<sup>11</sup> not as immoral, but as convenience-seeking, willing to bend rules, cut corners, and externalise costs while still aspiring to status and scale. The underlying pattern remains familiar: institutions are created, but the norms that sustain them are weak; laws exist, but compliance is often negotiated; and outcomes are demanded without the corresponding effort.

<sup>11</sup> Swapan Dasgupta. India Today. 24 August 1998. The Ugly Indian. <https://tinyurl.com/mry8jrj4>

16.155. At higher levels of development, growth relies less on ingenuity and more on reliability. Complex systems such as ports, highways, industrial clusters, supply chains, or regulatory institutions function only when millions of small actions align predictably over long periods. This alignment cannot be legislated into existence. It depends on citizens and organisations accepting delayed gratification as an economic necessity rather than a personal sacrifice.

16.156. For state capacity, the implication is direct. An entrepreneurial state cannot be sustained in a society that treats shortcuts as substitutes for learning. Experimentation requires tolerance for early inefficiency; competence emerges only through repetition and correction. Where delayed gratification is socially reinforced, institutions gain the space to learn, adapt, and reverse course without panic. Where impatience dominates, hysteresis sets in: skills decay, institutions forget how to do the hard work, and the cost of rebuilding capability rises sharply.

### **Deregulation – Institutional capability in action**

16.157. The preceding discussion has focused on how state capacity is shaped by human systems (skills, culture, teams, and values), through which public authority is exercised. Yet state capacity ultimately reveals itself not in organisational intent or internal reform alone, but in how institutions function at the interface between the State and economic actors. It is at this interface that coordination failures, procedural rigidities, and risk aversion are most visible, and where improvements in capability translate most directly into economic outcomes. Deregulation and compliance reduction, therefore, offer a concrete and observable test of state capacity in practice, bringing together many of the institutional challenges discussed in this chapter: coordination across agencies, the exercise of discretion under uncertainty, the ability to learn and correct course, and the reorientation of administrative effort from routine policing towards problem-solving and delivery.

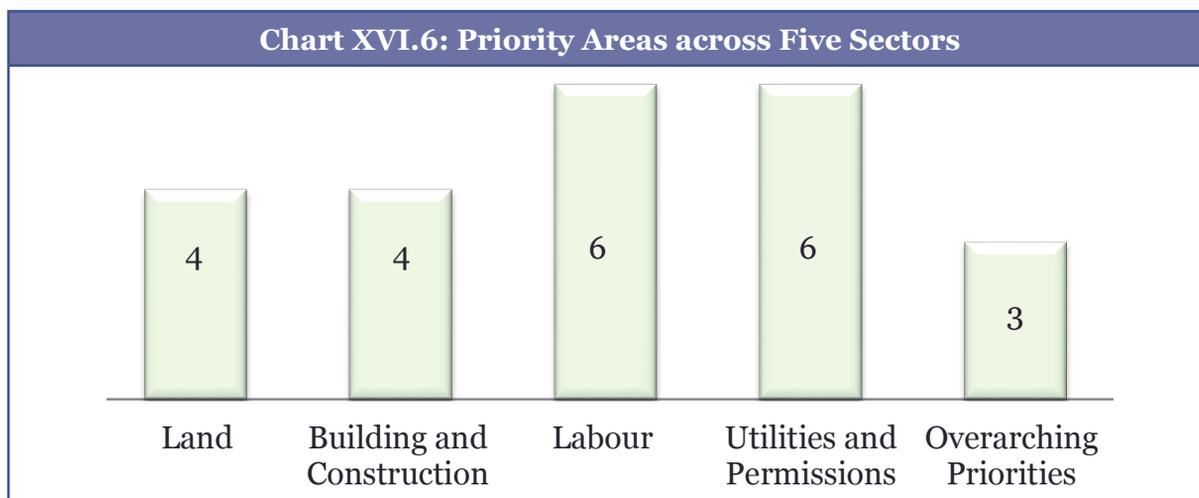
16.158. Chapter 5 of the Economic Survey 2024-25 discussed deregulation in operational terms, emphasising the role of States in undertaking systematic deregulation through a review of regulations for their cost-effectiveness, and framing Ease of Doing Business 2.0 as a reform effort that needed to be led at the State level. The chapter highlighted that States function as rule-making authorities across critical areas, including land, building regulations, labour welfare, electricity, and local trade and commerce. It also examined how regulatory mandates, such as permits, price and quantity controls, fees and taxes, inspections, and penalties, impose costs on enterprises by increasing the time, effort, and uncertainty involved in starting or operating a business. This analytical diagnosis provided the basis for moving from problem identification to institutional response. The ongoing Task Force on Compliance Reduction and Deregulation initiative of the Government of India represents the next step in this progression.

16.159. The Task Force on Compliance Reduction and Deregulation was constituted in January 2025 under the chairmanship of the Cabinet Secretary to drive reforms that simplify regulations and streamline procedures across States and Union Territories. The key objectives include: identifying redundant, overlapping, or outdated compliances and recommending their rationalisation; guiding States in amending laws, subordinate legislations, and procedures to align with principles of minimal regulation; encouraging adoption of standardised reform templates to promote consistency and predictability across jurisdictions; facilitating risk-based compliance frameworks and third-party involvement in inspections especially for micro, small, and medium enterprises; promoting digitisation and integration of all G2B services through an effective country-wide Single Window System linked to the National Single Window System; and documenting best practices of States and international benchmarks for replication and cross learning.

16.160. What distinguishes this exercise from earlier deregulation drives is not only the number of reforms, but the institutional process: cross-agency coordination, iterative problem-solving with States, and real-time learning, which touch the core elements of state capacity discussed in this chapter.

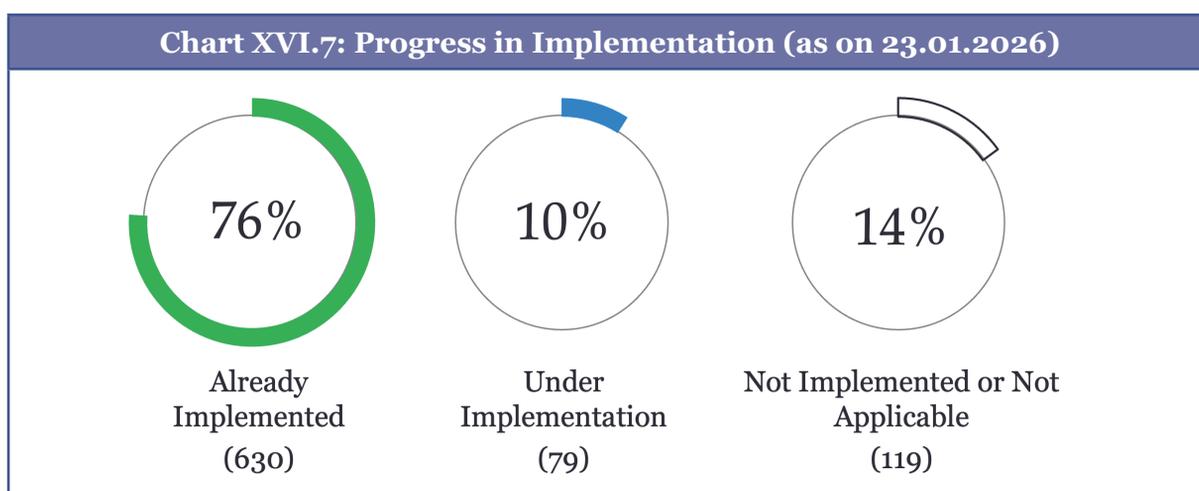
16.161. The Task Force identified 23 Priority Areas across five broad sectors that together account for a large share of regulatory interaction between enterprises and the State. These Priority Areas were identified through extensive consultations with Central Ministries, States, industry associations, and knowledge partners. The sectors include Land Use, Building and Construction, Labour, Utilities and Permissions, and a set of Overarching Priorities (Chart XVI.6). The emphasis has been on reducing procedural complexity without diluting legitimate safeguards.

16.162. Since March 2025, three rounds of Task Force visits have been undertaken, involving interactions with Chief Secretaries, senior officers, and industry associations. Officers from the Cabinet Secretariat, DPIIT, Ministry of MSME, and NITI Aayog formed part of these delegations. Additionally, regular monthly meetings are held between the Special Secretary of the Cabinet Secretariat and the Nodal Officers of the States. This continuous engagement model has reinforced ownership of reforms within State administrations and ensured that implementation challenges are addressed through iterative problem-solving rather than post-hoc assessment.



### Progress and National Scale of Implementation

16.163. The scale of the reform effort reflects both its ambition and its execution discipline. Chart XVI.7 provides an overview of the implementation progress to date. With 36 States and Union Territories expected to implement 23 Priority Areas each, the total number of actionable reforms across the country amounts to 828. As of 23 January 2026, 630 Priority Areas, representing 76 per cent of the total, have already been implemented. Another 79 Priority Areas, accounting for 10 per cent, are under active implementation. A limited number have been identified as not applicable in specific State contexts. Progress is tracked through a digital MIS platform that enables real-time monitoring, the identification of bottlenecks, and the dissemination of best practices, reinforced by regular high-level reviews and monthly monitoring by the Cabinet Secretariat. The cumulative progress of this effort across States and Union Territories is presented in Chart XVI.8, which reflects the implementation status of each priority area based on updates reported through the Task Force’s monitoring framework (as on 23 January 2026).



## Best practices and reforms beyond Priority Areas

16.164. Beyond the identified Priority Areas, several States and Union Territories have undertaken innovative reforms that go beyond the common reform templates, tailored to their specific administrative, economic, and spatial contexts. This demonstrates how the compliance reduction agenda has encouraged States to internalise deregulation as a continuous governance process rather than a checklist exercise. Best practices emerging from States are documented through State-wise dockets and shared on the MIS portal, enabling peer learning and replication across jurisdictions.

16.165. For instance, in Andhra Pradesh and Uttarakhand, the requirement for land conversion or change in land use has been eliminated for specific categories, significantly reducing procedural delays. In Assam, Jammu & Kashmir, Odisha, Puducherry, and Tripura, negative lists have been introduced for mixed land use zones, whereby all activities are permitted unless explicitly prohibited, replacing earlier prescriptive zoning frameworks. These reforms have enabled greater flexibility in land use while maintaining regulatory clarity. In the area of building and development norms, Haryana, Madhya Pradesh, Odisha, Tamil Nadu, Uttar Pradesh, and Uttarakhand have liberalised building bye-laws, and simplified development norms relating to setbacks, Floor Area Ratio (FAR), parking restrictions, and minimum plot area. These measures have reduced land loss, enabled higher utilisation of urban land, and facilitated project execution, particularly for industrial and commercial developments.

16.166. Several States have expanded the use of third-party inspections and self-certification to reduce regulatory bottlenecks. Chhattisgarh, Mizoram, Rajasthan, Tripura, and Uttar Pradesh have introduced third-party inspection mechanisms for building plan approvals. For environmental clearances, Andaman & Nicobar Islands, Andhra Pradesh, Goa, Tamil Nadu, and Uttarakhand have enabled self-certification and third-party certification for Consent to Operate, reducing dependence on routine departmental inspections. In the labour domain, Bihar, Gujarat, Odisha, Maharashtra, and Telangana have removed restrictions on women working in a wider range of industries and commercial establishments. Fire safety regulations have also been streamlined through the use of accredited third parties in Assam, Odisha, Telangana, and Tripura. Chhattisgarh, Gujarat, Haryana, Karnataka, and Uttar Pradesh have introduced State-level Acts similar to the Jan Vishwas Act, repealing outdated provisions, amending legacy statutes, and decriminalising minor offences. These reforms have reduced the fear of penal action for procedural non-compliance and reinforced trust-based regulation.

## Case Studies from Tripura, and Andaman & Nicobar Islands

16.167. The impact of deregulation is evident in State-level case studies. In the Andaman and Nicobar Islands, the introduction of an online process for Change in Land Use led to the disposal of hundreds of applications within months, the creation of additional tourism capacity, and a visible improvement in household and entrepreneurial credit flows. In Tripura, a comprehensive reform programme covering land, building regulations, labour, utilities, and overarching statutes has delivered measurable results. Following the Rising Northeast Investors Summit 2025, a substantial number of Memoranda of Understanding have progressed to implementation, with Tripura accounting for a significant share of the total investments committed to the Northeast. These outcomes reflect the cumulative impact of systematic deregulation, institutional coordination, and sustained engagement with industry. These experiences demonstrate how systematic deregulation translates administrative reform into improved economic outcomes.

16.168. The outcomes of the Compliance Reduction and Deregulation Initiative are visible in reduced compliance burdens, faster approvals, greater reliance on digital processes, and improved predictability for businesses. More importantly, the initiative demonstrates how deregulation, when pursued as a continuous governance process rather than a one-off exercise, strengthens state capacity itself. By lowering friction at the interface between firms and the State, administrative energy is redirected from routine policing towards coordination, monitoring, and problem-solving.

16.169. Outcomes of Phase I are encouraging. The experience of Phase I illustrates a broader lesson of this chapter: that state capacity is built not only through new institutions or additional controls, but through disciplined removal of frictions that impede productive activity. Phase II of the Compliance Reduction and Deregulation initiative was rolled out in January 2026 to cover additional priority areas, including land, building and construction, utilities and permissions, environment, education, health, labour, and overarching reforms.

16.170. The current phase of deregulation demonstrates how disciplined removal of friction can strengthen state capacity at scale. India's development history also evidences how phases emphasising facilitation, neutrality, and ecosystem-wide public goods proved successful. In other words, India is no stranger to the 'entrepreneurial state' which was discussed and defined in Part I of the chapter under the section titled 'The Common Thread: The Entrepreneurial State'. It simply has to rediscover that spirit. The transformation of India's software industry illustrates this with particular clarity (Box XVI.9).

### Box XVI.9: What visionary bureaucracy can achieve: India's case experience from "Produce and Protect" to broad-based industry promotion

India's experience in developing a globally competitive software industry illustrates a distinctive mode of state capacity in action. From the 1960s to the early 1980s, the electronics and computing sector was governed by a "produce and protect" regime, characterised by state-owned enterprises, import substitution, and pervasive controls over private and foreign participation. Despite substantial public investment, the state proved unable to coordinate production, technology selection, and market development, resulting in fragmentation, delays, and weak outcomes.<sup>12</sup>

A decisive shift occurred in the mid-1980s, when the state moved away from direct production and protection towards broad-based industry promotion. Rather than withdrawing from the sector or selecting national champions, public policy focused on reducing regulatory barriers, enabling private entry, and lowering ecosystem-wide costs. This included recognising software as an industry, easing foreign exchange and import restrictions for exporters, investing in technical education, expanding telecommunications infrastructure, and creating technology parks that offered reliable power, connectivity, and single-window clearances.

The shift to industry promotion was accompanied by changes in leadership and administrative orientation. Senior officials more open to private initiative and foreign participation were deputed in the Department of Electronics. At the time, a growing cohort of Indian expatriates trained at the IITs and holding executive positions in U.S. technology firms, recognised India's technical talent but remained wary of the country's restrictive regulatory environment, particularly in the aftermath of IBM's exit in 1978. With the change in policy stance, foreign firms began to test India's openness. In 1985, the government approved Citibank's proposal to establish a private satellite link to support remote software services, followed shortly by a similar approval for Texas Instruments to set up an offshore software development centre in Bangalore. Reflecting the extent of regulatory flexibility exercised during this phase, N. Seshagiri, one of the original members of the Bhabha Committee and later the principal adviser on electronics policy to the Prime Minister of India, candidly observed that "*we broke 26 separate rules to accommodate Texas Instruments' Bangalore subsidiary and are willing to break more.*"<sup>13</sup>

Crucially, these promotional policies were neutral across firms and scale. They did not privilege individual incumbents, nor did they insulate domestic players from competition. Instead, they supported the industry as a whole, allowing multiple firms to emerge, compete, and integrate with global markets. The result was a fragmented yet dynamic ecosystem that proved resilient, innovative, and export-oriented.

<sup>12</sup> Dinsha Mistree. Stanford Law School Working Paper Series. From Produce to Protect to Promoting Private Industry: The Indian State's Role in Creating a Domestic Software Industry. <https://law.stanford.edu/wp-content/uploads/2019/12/Mistree-Making-Electronics-in-India.pdf>

<sup>13</sup> SIPA News (1988), quoted in Evans (1989)

This experience underscores that effective state capacity does not require pervasive control or discretionary intervention. When institutional effort is redirected from protection and micromanagement towards facilitation, coordination, and provision of public goods, the state can shape outcomes decisively while preserving competition and private initiative.

## Conclusion

16.171. India's recent economic performance has demonstrated that macroeconomic stability and growth can be sustained even in a turbulent global environment. But this chapter has argued that the nature of the challenge now facing India is changing. In a world marked by geopolitical fragmentation, contested trade, volatile capital flows, and rapid technological shifts, growth by itself is no longer the binding constraint. What increasingly differentiates countries that merely absorb shocks from those that shape outcomes is the depth and quality of their state capacity.

16.172. The first part of the Chapter locates this challenge in the global context. It argued that India's transition from Swadeshi to strategic resilience, and ultimately to strategic indispensability, will be determined not only by how fast the economy grows, but by whether domestic capabilities become embedded in global production systems in ways that enhance reliability, learning, and external stability. Strategic resilience rests on the State's ability to anticipate vulnerabilities, coordinate across institutions, and respond under stress without disorder. Strategic indispensability demands more: the capacity to build capabilities that others depend upon, making India a source of stability and value rather than only a participant in global markets.

16.173. The second part of the chapter examined what this requirement implies institutionally. It showed that state capacity is not a single reform or a single institution, but a composite outcome shaped by how decisions are made, how risk and failure are managed, how administration is organised around outcomes, how regulation is designed and implemented, and how incentives influence the behaviour of firms and citizens. Weakness in any one of these dimensions can negate progress in others. Capacity is therefore not built by proclamation, but through steady alignment across institutional systems.

16.174. Equally, the chapter has emphasised that state capacity is not produced by the State alone. It is co-created through the everyday behaviour of firms and citizens. Where firms compete by building productivity, scale, and technological capability rather than by seeking protection or negotiation, the demand placed on the State shifts from discretion to competence. Where citizens internalise compliance and care for shared systems, enforcement burdens fall and administrative effort can be redirected toward

coordination and delivery. Where these alignments hold, institutional performance improves even without expanding the size of government.

16.175. The experience with Compliance Reduction and Deregulation Initiative illustrates this logic in practice. Deregulation, when pursued as a continuous and coordinated governance process, is not a retreat of the State but a strengthening of it. By simplifying rules, clarifying responsibilities, and making processes predictable and time-bound, administrative effort is shifted away from low-value policing toward problem-solving, monitoring, and execution. In this sense, deregulation becomes not only a pro-business reform, but a mechanism for building state capacity itself.

16.176. The broader lesson is that India's movement from Swadeshi to strategic resilience, and from resilience to strategic indispensability, cannot be achieved through insulation alone. Intelligent indigenisation requires discipline, outward orientation, and credible exit. Manufacturing, exports, and participation in global value chains act as institutional stress tests, exposing weaknesses that sheltered activities can conceal. Success in these domains depends as much on the quality of institutions as on capital, incentives, or intent.

16.177. In a more uncertain world, risk is unavoidable. The advantage lies in managing it better. Countries that can act before certainty emerges, correct course without paralysis, and align incentives across the State, firms, and citizens are better placed to convert growth into influence. State capacity is therefore not an administrative concern at the margin. It is the foundation on which strategic resilience is built and the pathway through which strategic indispensability becomes possible.

*“If India is to truly fulfill its potential, it must move from a ‘Ruler’s Raj’ to a ‘Citizen’s Raj’.”*  
— Sir Mark Tully, 9th Nani Palkhivala Memorial Lecture, Chennai, February 12, 2011

\*\*\*



सत्यमेव जयते

Government of India

आर्थिक कार्य विभाग  
**DEPARTMENT OF  
ECONOMIC AFFAIRS**