

ECONOMIC SURVEY 2023-24



सत्यमेव जयते
Government of India





Economic Survey 2023-24

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Preface: Steering the country through compacts and consensus

The economy continues to expand

In April, we commenced a new financial year. In May, we learnt that the Indian economy is estimated to have grown 8.2% in real terms in FY24. In June, a new government took office. The National Democratic Alliance government led by Prime Minister Narendra Modi has returned to power with a historic mandate for a third term. His unprecedented third popular mandate signals political and policy continuity.

The Indian economy is on a strong wicket and stable footing, demonstrating resilience in the face of geopolitical challenges. The Indian economy has consolidated its post-Covid recovery with policymakers – fiscal and monetary – ensuring economic and financial stability. Nonetheless, change is the only constant for a country with high growth aspirations. For the recovery to be sustained, there has to be heavy lifting on the domestic front because the environment has become extraordinarily difficult to reach agreements on key global issues such as trade, investment and climate.

High economic growth in FY24 came on the heels of growth rates of 9.7% and 7.0%, respectively, in the previous two financial years. The headline inflation rate is largely under control, although the inflation rate of some specific food items is elevated. The trade deficit was lower in FY24 than in FY23, and the current account deficit for the year is around 0.7% of GDP. In fact, the current account registered a surplus in the last quarter of the financial year. Foreign exchange reserves are ample. Public investment has sustained capital formation in the last several years even as the private sector shed its balance sheet blues and began investing in FY22. Now, it has to receive the baton from the public sector and sustain the investment momentum in the economy. The signs are encouraging.

National income data show that non-financial private-sector capital formation, measured in current prices, expanded vigorously in FY22 and FY23 after a decline in FY21. However, investment in machinery and equipment declined for two consecutive years, FY20 and FY21, before rebounding strongly. Early corporate sector data for FY24 suggest that capital formation in the private sector continued to expand but at a slower rate.

Sustaining overseas investor interest will require effort

Foreign Direct Investment, the subject of much analysis, has held up. RBI data on India's Balance of Payments shows us that the investment interest of external investors, measured in terms of dollar inflows of new capital, was USD45.8 billion in FY24 compared to USD47.6 billion in FY23. This slight decline is in line with global trends. Reinvestment of earnings remained the same. Repatriation of investment was USD29.3 billion in FY23 and USD44.5 billion in FY24. Many private equity investors took advantage of buoyant equity markets in India and exited profitably. It is a sign of a healthy market environment that offers profitable exits to investors, which will bring newer investments in the years to come. That said, the environment for foreign direct investment to grow in the coming years is not highly favourable for many reasons.

Interest rates in developed countries are much higher than they were during and before Covid years. This not only means a higher cost of funding but also a higher opportunity cost to invest abroad. Second, emerging economies have to compete with active industrial policies in developed economies involving considerable subsidies that encourage domestic investment.

Third, notwithstanding the impressive strides made in the last decade, uncertainties and interpretations related to transfer pricing, taxes, import duties and non-tax policies remain to be addressed. Lastly, geopolitical uncertainties, which are on the rise, will likely exert a bigger influence on capital flows, notwithstanding other reasons for preferring to invest in India.

Shocks and not structural forces have influenced employment

On employment generation, the Periodic Labour Force Survey provides quarterly data on urban employment indicators and annually for the entire country, including rural India. A surge in agriculture employment is partly explained by reverse migration and the entry of women into the labour force in rural India. The Annual Survey of Industries has data on workers in nearly 2.0 lakh Indian factories. The total number of factory jobs grew annually by 3.6% between 2013-14 and 2021-22. Somewhat more satisfyingly, they grew faster at 4.0% in factories employing more than a hundred workers than in smaller factories (those with less than a hundred workers). The annual growth rate was 1.2% in the latter set of factories. In absolute numbers, employment in Indian factories has grown from 1.04 crore to 1.36 crore in this period. India does not yet have a corresponding Annual Survey of Services. The lack of availability of timely data on the absolute number of (formal and informal) jobs created even at annual intervals, let alone at higher frequencies, in various sectors – agriculture, industry including manufacturing and services – precludes an objective analysis of the labour market situation in the country.

The Annual Survey of Unincorporated Enterprises for 2022-23, when compared with the results of the NSS 73rd round of the ‘Key Indicators of Unincorporated Non-Agricultural Enterprises (Excluding Construction) in India’ shows that overall employment in these enterprises fell from 11.1 crore in 2015-16 to 10.96 crores. There was a reduction of 54 lakh workers in manufacturing but the expansion of the workforce in trade and services gained in jobs limited the overall reduction in the number of workers in unincorporated enterprises to around 16.45 lakhs between these two periods. This comparison masks a big jump in manufacturing jobs that seems to have occurred between 2021-22 (April 2021 to March 2022) and 2022-23 (October 2022 to September 2023).

India suffered two big economic shocks in quick succession. Bad debts in the banking system and high corporate indebtedness were one. It took the first term of the present government and more to bring it under control. The Covid pandemic was the second shock and quickly followed the first one. So, it is difficult to conclude that the Indian economy’s ability to create employment is structurally impaired. Nonetheless, going forward, the task is cut out.

Between the last Economic survey published in January 2023 and this one, big changes are afoot in the geopolitical environment. The global backdrop for India’s march towards Viksit Bharat in 2047 could not be more different from what it was during the rise of China between 1980 and 2015. Then, globalisation was at the cusp of its long expansion. Geopolitics was largely calm with the end of the Cold War, and Western powers welcomed and even encouraged the rise of China and its integration into the world economy. Concerns over climate change and global warming were not so pervasive or grave then as they are now. Fourth, the advent of Artificial Intelligence casts a huge pall of uncertainty as to its impact on workers across all skill levels – low, semi and high. These will create barriers and hurdles to sustained high growth rates for India in the coming years and decades. Overcoming these requires a grand alliance of union and state governments and the private sector.

Employment generation is the real bottom line for the private sector

It is worth reiterating that job creation happens mainly in the private sector. Second, many (not all) of the issues that influence economic growth, job creation and productivity and the actions to be taken therein are in the domain of state governments. So, in other words, India needs a tripartite compact, more than ever before, to deliver on the higher and rising aspirations of Indians and complete the journey to Viksit Bharat by 2047.

In more than one respect, the action lies with the private sector. In terms of financial performance, the corporate sector has never had it so good. Results of a sample of over 33,000 companies show that, in the three years between FY20 and FY23, the profit before taxes of the Indian corporate sector nearly quadrupled. Further, newspaper headlines told us that the corporate profits-to-GDP ratio rose to a 15-year high in FY24. *BusinessLine* reported, “The corporate profit for the Nifty-500 universe was up 30 per cent last fiscal to ₹14.11-lakh crore against ₹10.88 lakh crore in FY23. The nominal GDP grew 9.6 per cent y-o-y to ₹295-lakh crore (₹269-lakh crore)”. Hiring and compensation growth hardly kept up with it. But, it is in the interest of the companies to step up hiring and worker compensation.

The Union government cut taxes in September 2019 to facilitate capital formation. Has the corporate sector responded? Between FY19 and FY23, the cumulative growth in private sector non-financial Gross Fixed Capital Formation (GFCF) is 52% in current prices. During the same period, the cumulative growth in general government (which includes states) is 64%. The gap does not appear to be too wide.

However, when we break it down, a different picture emerges. Private sector GFCF in machinery and equipment and intellectual property products has grown cumulatively by only 35% in the four years to FY23. Meanwhile, its GFCF in ‘Dwellings, other buildings and structures’ has increased by 105%. This is not a healthy mix. Second, the slow pace of investment in M&E and IP Products will delay India’s quest to raise the manufacturing share of GDP, delay the improvement in India’s manufacturing competitiveness, and create only a smaller number of higher-quality formal jobs than otherwise.

Nonetheless, there is a silver lining in the data. In the two years since FY21, GFCF by the private sector has grown faster. General government GFCF rose a cumulative 42% between FY21 and FY23. Non-Financial Private Sector’s overall GFCF increased by 51%; investment in Machinery and Equipment and Intellectual Property Products increased by 38%. So, the growth in these two critical sub-components of Private Sector GFCF is similar to that of the overall GFCF by the General Government. This is a statistic that bears watching. They should continue to invest. To do so, they need demand visibility. That comes from employment and income growth.

In a recent article,² *the Economist* cites independent research that predicted a slow demise of India’s services exports over the next decade. While the boom in telecommunications and the rise of the internet facilitated business process outsourcing, the next wave of technological evolution might bring the curtains down on it. In this milieu, the corporate sector has a responsibility, as much to itself as it is to society, to think harder about ways AI will augment labour rather than displace workers. Hiring in the IT sector has slowed significantly in the last two years. We do not have a full picture of overall corporate hiring in the country on a regular

1 ‘Corporate profit to GDP hits 15 year high as input cost moderates’, *BusinessLine*, 11th June 2024 (<https://www.thehindubusinessline.com/economy/corporate-profit-to-gdp-hits-15-year-high-as-input-cost-moderates/article68277319.ece>)

2 ‘Will Services make the world rich?’, *The Economist*, 24th June 2024 (<https://www.economist.com/finance-and-economics/2024/06/24/will-services-make-the-world-rich>)

basis. In any case, deploying capital-intensive and energy-intensive AI is probably one of the last things a growing, lower-middle-income economy needs.

A Staff Discussion Note of the International Monetary Fund published in June 2024³ notes that Generative Artificial Intelligence raised profound concerns about massive labour disruptions and inequality. The IMF SDN goes on to recommend well-designed excess corporate profit taxes and high personal income taxes on capital through better enforcement of automatic information exchange between countries and enhanced taxation of capital gains. However, employment is about dignity, self-worth, self-esteem, self-respect, and standing in the family and community, not just about the income it brings. That is why it is in the enlightened self-interest of the Indian corporate sector, swimming in excess profits, to take its responsibility to create jobs seriously. Of course, it must find people with the right attitude and skills.

That requires another tripartite compact - between the government, the private sector and academia. This compact is to reboot the mission to skill and equip Indians to catch up with and get ahead of technological evolution. To succeed in the mission, governments must unshackle the industry and academic institutions to play their respective roles in that mammoth task. For example, despite several amendments over the years, the Apprenticeship Act remains a work in progress, at best, in encouraging large-scale apprenticeships in the country. The New Education Policy 2020 proposes freeing India's higher education from regulatory oversight to market oversight. A corporate sector that helps shape the design of higher education with inputs to curriculum, evaluation standards, and faculty will pave the way for a high-quality higher education that market competition brings, replacing regulatory oversight. If anything, another article⁴ in *The Economist* that hails the arrival of China as a superpower in science should be sufficient inspiration for the corporate sector and academia to get their act together on scientific research and development.

The real corporate social responsibility

The role of the corporate sector has never been greater than it is now. Two other areas of corporate responsibility deserve mention here. The pandemic saw the emergence of the Indian retail investor as the bulwark of market stability. The culture of investing for the long term has to be nurtured and sustained. Market practices that take their cues from the thinly disguised leveraged bets masquerading as financial innovations in the developed world have no place in a developing country with a low per-capita income. Second, just as corporate profits are booming, the net interest margin of Indian banks has risen to a multi-year high. It is a good thing. Profitable banks lend more. To sustain the good times, it is important not to forget the lessons of the last financial cycle downturn. The banking industry must aim to lengthen the gap between two NPA cycles. It should also resist the temptation to pursue short-term profits at the expense of the customer. Product misselling is too rampant to be dismissed as an aberration of a few overenthusiastic sales personnel. The same can be said of the insurance industry as well. Prompt and reasonable settlement of insurance claims and a lower rejection rate are necessary to increase insurance penetration. Acknowledgement of misselling and misrepresentation and compensating for consequential losses is a good business practice enjoined upon stockbroking, fund management, banking and insurance firms.

Corporates benefit from the higher demand generated by employment and income growth. The financial sector benefits from channelling household savings for investment purposes.

3 'Broadening the gains from Generative AI: the role of fiscal policies', Staff Discussion Note, International Monetary Fund, June 2024 (<https://tinyurl.com/39dy7dv3>)

4 'China has become a scientific superpower', *The Economist*, 12th June 2024 (<https://www.economist.com/science-and-technology/2024/06/12/china-has-become-a-scientific-superpower>)

These linkages must grow stronger and last longer to meet the infrastructure and energy transition investments in the coming decades. Short-termism can weaken these linkages.

For India's working-age population to be gainfully employed, they need skills and good health. Social media, screen time, sedentary habits, and unhealthy food are a lethal mix that can undermine public health and productivity and diminish India's economic potential. The private sector's contribution to this toxic mix of habits is substantial, and that is myopic. The emerging food consumption habits of Indians are not only unhealthy but also environmentally unsustainable. India's traditional lifestyle, food and recipes have shown how to live healthily and in harmony with nature and the environment for centuries. It makes commercial sense for Indian businesses to learn about and embrace them, for they have a global market waiting to be led rather than tapped.

Governments, on their part...

Policymakers – elected or appointed – have to rise to the challenge as well. There has to be conversation, cooperation, collaboration, and coordination across ministries, states, and between the union and states. Few people outside the government – living or dead – can understand the complexity of governing and transforming a nation of India's (population) size, (geographical) spread and social and cultural diversity within a democratic framework. The political class, with its ears to the ground and the civil service, with its exposure to districts, states and central Ministries, have a better shot at (at least) a partial understanding of this complexity. They intuitively know there is no place for exclusive approaches and binary choices, which are the staple of sterile discussions and discourses. Examples are urban vs. rural, growth vs. equity or development, and manufacturing vs. services. They intuitively know that India needs multiple development pathways. That is a good thing. But it is easier said than done. It has not been done before. Not on this scale. Not in the time frame and not amidst a turbulent global environment. Forging and sustaining consensus between governments, businesses and the social sectors are necessary to succeed in this endeavour.

Agriculture can be a growth engine if..

The agriculture sector is one area ripe for and in need of such a pan-India dialogue. Agriculture and farmers matter for a nation. Most countries understand that. India is no exception. India subsidises their water, electricity and fertilisers. The former two are provided virtually free. Their incomes are not taxed. The government offers them a minimum support price (MSP) for 23 selected commodities. Monthly cash support is offered to farmers through the PM-KISAN scheme. Indian governments – national and sub-national – write off their loans. So, governments in India spend enough resources to look after the farmers well. Yet, a case can be made that they can be served better with some re-orientation of existing and new policies.

A panoply of policies – by national and sub-national governments - working at cross-purposes with each other is hurting farmers' interests, destroying soil fertility, depleting groundwater, polluting rivers and the environment with nitrous oxide emissions, starving the crops of nutrients and undermining people's health with a diet rich in sugar and carbohydrates rather than fibre and protein. The payoff will be immense if we untie the knots that bedevil farm sector policies. More than anything else, it will restore faith in the self-confidence and ability of the state to steer the nation to a better future, apart from delivering socio-economic benefits.

Earlier development models featured economies migrating from farm beginnings to industrialisation to value-added services in their development journey. Technological advancements and geopolitics are challenging this conventional wisdom. Trade protectionism,

resource-hoarding, excess capacity and dumping, onshoring production and the advent of AI are narrowing the scope for countries to squeeze out growth from manufacturing and services. That is forcing us to turn conventional wisdom on its head. Can the farm sector be the saviour? A return to roots, as it were, in terms of farming practices and policymaking, can generate higher value addition from agriculture, boost farmers' income, create opportunities for food processing and exports and make the farm sector both fashionable and productive for India's urban youth. When resolved, the problem areas mentioned above that the current policy configuration has created over the years can become sources of India's strength and a model for the rest of the world - developing and developed.

Unleashing small enterprises

Another area where policy intentions have yet to manifest in desired outcomes is with respect to small, medium, and large enterprises. Earlier, several products were reserved for small-scale industries. That was phased out as it benefitted neither the small-scale industries nor the overall economy. Recent concerted efforts at formalising them are making progress. Progress is relatively slower on access to finance. Buyers and creditors are shedding old mindsets and practices too slowly for these enterprises to feel the effect. However, these enterprises need maximum relief from the compliance burdens they face. Laws, rules and regulations stretch their finances, abilities and bandwidth, perhaps robbing them of the will to grow.

Successful Energy transition is an orchestra

Other priorities, such as energy transition and mobility, may pale compared to the complexity of getting the farm sector policies right. Still, they have one thing in common with it. They require getting many things across several ministries and states aligned. The list is long.

Energy transition and mobility issues require attention in the following areas:

- (a) resource dependence on hostile nations;
- (b) technological challenges such as intermittency of power generation, ensuring grid stability amidst surges and drop in generation from renewable energy sources and battery storage
- (c) recognition of the opportunity cost of tying up land in a land-scarce country;
- (d) fiscal implications that involve both additional expenditures for subsidising renewable energy generation and for e-mobility solutions, loss of tax and freight revenue currently accruing from the sale and transportation of fossil fuels;
- (e) impairment to bank balance sheets from the so-called 'stranded assets' and
- (f) examination of the merits of alternative mobility solutions such as public transportation models and more.

Emulating policy practices of other nations may be neither feasible nor desirable, for solutions may not emerge from approaches and places that created the problems in the first place.

Letting go is part of good governance

While contemplating the challenges that lie ahead, one should not be daunted because the social and economic transformation of democratic India is a remarkable success story. We have come a long way. The economy has grown from around USD288 billion in FY93 to USD3.6 trillion in FY23. India has generated more growth per dollar of debt than other comparable nations. Abject poverty has all but been eliminated. Human development indicators have

improved, and more Indians, especially women, are getting educated. For all its flaws and warts, the system has delivered accountability through the democratic process and public discourse, where the occasional and rarer mature commentary proves effective. We should not lose sight of that.

However, it would be a missed opportunity - as there have been many in the past - not to strengthen a system to steer the country through a future that has become immeasurably uncertain. After nearly eight decades of relative peace at the global level, the world is moving towards a larger and wider conflict with longer-term effects. The Indian state can free up its capacity and enhance its capability to focus on areas where it has to by letting go of its grip in areas where it does not have to. The Licensing, Inspection and Compliance requirements that all levels of the government continue to impose on businesses is an onerous burden. Relative to history, the burden has lightened. Relative to where it ought to be, it is still a lot heavier. The burden is felt more acutely by those least equipped to bear it – small and medium enterprises. It holds them back, leashes their aspirations, and, in the process, holds the country back. On the face of it, it does not seem to matter because the economic growth rates are good, and there are visible signs of progress. But, we will never know the counterfactual: “what it might have been”.

Ishopanishad enjoins all of us to let go of (renounce) our possessions, be free and enjoy that freedom:

ईशा वास्यमदिं सर्वं यत्कञ्चि जगत्यां जगत्।
तेन त्यक्तेन भुञ्जीथा मा गृधःकस्यस्वदिधनम्॥

Power is a prized possession of governments. They can let go of at least some of it and enjoy the lightness it creates in both the governed and the governing.

Finally,...

The tripartite compact that this country needs to become a developed nation amidst emerging unprecedented global challenges is for governments to trust and let go, for the private sector to reciprocate the trust with long-term thinking and fair conduct and for the public to take responsibility for their finances and their physical and mental health.

The Economic Survey 2023-24 covers many of the issues discussed above in its several chapters, apart from informing readers of government policies and their performance, their impacts, innovations, developments and success stories worth emulating. As before, the staple content of the Survey is chapters that provide an assessment of the various sectors such as agriculture, industry, infrastructure and services.

For us in the Economics Division in the Department of Economic Affairs, putting the Economic Survey together and getting it into your hands or electronic devices is a labour of love. Recording and sharing the country’s progress in the year under review and reflecting on what it must do and must not to achieve the progress it deserves is a learning experience for us. In doing so, we may have made mistakes. Please do tell us. We promise to keep getting better at it. Ultimately, that is all we can and should ask of ourselves.

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Abbreviations

AAGR	Average Annual Growth Rate
AAI	Airport Authority of India
AAUs	Assigned Amount Units
AAY	Antyodaya Anna Yojana
ABC	Academic Bank of Credits
ABDM	Ayushman Bharat Digital Mission
ABHA	Ayushman Bharat Health Account
AB-PMJAY	Ayushman Bharat Pradhan Mantri Jan Arogya Yojana
AB-RPY	Aatmanirbhar Bharat Rojgar Protsahan Yojana
ABRY	Aatmanirbhar Bharat Rojgar Yojana
ABS	Automatic Block Signaling
ACCs	Air Cargo Complexes
ADB	Asian Development Bank
ADP	Aspirational Districts Programme
AEs	Advanced Economies
AFHC	Adolescent Friendly Health Clinic
AGEY	Aajeevika Grameen Express Yojana
AHIDF	Animal Husbandry Infrastructure Development Fund
AI	Artificial Intelligence
AI	Artificial Intelligence
AI IP	Artificial Intelligence Intellectual Property
AIBP	Accelerated Irrigation Benefit Programme
AICTE	All India Council for Technical Education
AIF	Alternative Investment Fund
AIF	Agriculture Infrastructure Fund
AIIMS	All India Institute of Medical Sciences
AIRAWAT	AI Research Analytics and Knowledge Dissemination Platform
AISHE	All India Survey on Higher Education
AITIGA	ASEAN-India Trade in Goods Agreement
AKRSP	Aga Khan Rural Support Programme
AMCs	Asset Management Companies
AMI	Agricultural Marketing Infrastructure
AMRIT	Affordable Medicines and Reliable Implants for Treatment
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
APAAR	Automated Permanent Academic Account Registry
API	Application Programming Interface
APIs	Active Pharmaceutical Ingredients
APLM	Agricultural Produce and Livestock Marketing
APMCs	Agricultural Produce Marketing Committees
APMR	Agricultural Produce Marketing Regulation

APY	Atal Pension Yojana
ARCs	Asset Reconstruction Companies
ARG	Automatic Rain Gauge
ARHC	Affordable Rental Housing Complexes
ARIMA	Autoregressive Integrated Moving Average
ASBA	Application Supported by Blocked Account
ASI	Annual Survey of Industries
ASTROSAT	Space Astronomy Observatory
ATF	Aviation Turbine Fuel
ATP	Automatic Train Protection
AuM	Assets under Management
AWC	Anganwadi Centre
AWS	Automatic Weather Station
BBSSL	Bhartiya Beej Sahakari Samiti Limited
BDI	Baltic Dry Index
BE	Budget Estimate
BFSI	Banking, Financial Services and Insurance
BFT	Bare Foot Technician
BHEL	Bharat Heavy Electricals Limited
BIM	Building Information Modelling
BIS	Bank for International Settlements
BoP	Balance of Payment
BPM	Business Process Management
BPO	Business Process Outsourcing
BRO	Border Roads Organization
BRSR	Business Responsibility and Sustainability Report
BSF	Black Soldier Flies
BTS	Base Transceiver Stations
CACP	Commission for Agricultural Costs & Prices
CAD	Current Account Deficit
CAG	Comptroller and Auditor General of India
CAGR	Compound Annual Growth Rate
Capex	Capital Expenditure
CBG	Compressed Bio Gas
CBIC	Central Board of Indirect Taxes and Customs
CBM	Coal Bed Methane
CBSE	Central Board of Secondary Education
CC	Clearing Corporations
CCS	Carbon Capture and Storage
CCTS	Carbon Credit Trading Scheme
CCUS	Carbon Capture, Utilization, and Storage
C-DAC	Centre for Development of Advanced Computing

CDM	Clean Development Mechanism
CDRI	Coalition for Disaster Resilient Infrastructure
CDs	Certificate of Deposits
CECPA	Comprehensive Economic Cooperation and Partnership Agreement
CEPA	Comprehensive Economic Partnership Agreement
CERs	Certified Emission Reductions
CET-I	Common Equity Tier-I
CFPI	Consumer Food Price Index
CGA	Controller General of Accounts
CGS	Credit Guarantee Scheme
CGTMSE	Credit Guarantee Fund Trust for Micro and Small Enterprises
CHC	Community Health Centre
CHCs	Custom Hiring Centres
CiC	Currency in Circulation
CII	Confederation of Indian Industry
CIL	Coal India Limited
CIP	Central Issue Price
CIRPs	Corporate Insolvency Resolution Processes
CIS	Customer Information Sheet
ckm	circuit kilometre
CMIE	Centre for Monitoring Indian Economy
CMM	Coal Mine Methane
CND	Consumer Non-Durables
CNG	Compressed Natural Gas
CO ₂	Carbon Dioxide
COP	Conference of the Parties
CoPs	Conference of Parties
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CPI	Consumer Price Index
CPI-C	Consumer Price Index-Combined
CPs	Commercial Paper
CPSEs	Central Public Sector Enterprises
CPSU	Central Public Sector Undertakings
CQGR	Compounded Quarterly Growth Rate
CRAR	Capital to Risk-Weighted Assets Ratio
CRISIL	Credit Rating Information Services of India Limited
CROPIC	Collection of Real-time Observations and Photographs of Crops
CRP	Community Resource Person
CRR	Cash Reserve Ratio
CSIR	Council of Scientific and Industrial Research
CSL	Cochin Shipyard Limited
CSO	Civil Society Organisation

CSO	Central Statistical Office
CSPs	Cloud Service Providers
CSR	Corporate Social Responsibility
CSS	Central Sector Schemes
CV	Coefficient of Variation
CWS	Current Weekly Status
CwSN	Children with Special Needs
DA&FW	Department of Agriculture and Farmers Welfare
DAHD	Department of Animal Husbandry and Dairying
DAP	Di-ammonium Phosphate
DAY-NRLM	Deendayal Antyodaya Yojana- National Rural Livelihood Mission
DAY-NULM	Deendayal Antyodaya Yojana – National Urban Livelihoods Mission
DBFOT	Design, Build, Finance Operate and Transfer
DBI	Diversion-Based Irrigation
DBT	Direct Benefit Transfer
DDU-GKY	Deen Dayal Upadhyaya Grameen Kaushalya Yojana
DEH	Districts as Exports Hub
DFCs	Dedicated Freight Corridors
DFI	Digital Financial Inclusion
DFI	Doubling Farmers Income Report
DGCA	Directorate General of Civil Aviation
DGQI	Data Governance Quality Index
DIETs	District Institutes of Education and Training
DIKSHA	Digital Infrastructure for Knowledge Sharing
DISCOMs	Distribution Companies
DISHA	District Development Coordination and Monitoring Committees
DoP	Department of Posts
DPI	Digital Public Infrastructure
DPIIT	Department for Promotion of Industry and Internal Trade
DRI	Disaster Resilient Infrastructure
DRIP	Dam Rehabilitation and Improvement Project
DRTs	Debt Recovery Tribunals
DST	Dual System of Training
DTH	Direct to Home
EAEU	Eurasian Economic Union
ECB	External Commercial Borrowings
ECB	European Central Bank
ECCE	Early Childhood Care and Education
ECTA	Economic Cooperation and Trade Agreement
EFTA	European Free Trade Association
EI	Electronic Interlocking
E-LoGS platform	Ease of Logistics Services platform

EMC	Electronics Manufacturing Clusters
EMDEs	Emerging Markets and Developing Economies
EMEs	Emerging Market Economies
EMI Payment	Equated Monthly Installment Payment
EMI/EMC	Electromagnetic interference/Electromagnetic compatibility
eNAM	National Agriculture Market
e-NAM	e- National Agriculture Market
EPF	Employee Provident Fund
EPFO	Employees' Provident Fund Organisation
ePoS	electronic point of sale
ER&D	Enterprise, Research, and Development
ERUs	Emission Reduction Units
ESG	Environmental, Social, and Governance
ESS	Energy Storage Systems
ETCA	Economic and Technical Cooperation Agreement
ETFs	Exchange Traded Funds
EU	European Union
EU-ETS	European Union Emission Trading Scheme
EVs	Electric Vehicles
EXIM	Export-Import Bank
FADA	Federation of Automobile Dealers Associations
FAO	Food and Agriculture Organisation
FATF	Financial Action Task Force
FCI	Food Corporation of India
FCRA	Forward Contracts Regulation Act
FDI	Foreign Direct Investment
Fed	Federal Reserve
FER	Foreign Exchange Reserve
FIDF	Fisheries Infrastructure Development Fund
FLFPR	Female Labour Force Participation Rate
FLN	Foundational Literacy and Numeracy
FMC	Forward Market Commission
FOMC	Federal Open Market Committee
FPI	Food Processing Industry
FPI	Foreign Portfolio Investment
FPOs	Farmer Producers Organisation
FPS	Fair Price Shop
FRBs	Foreign Reinsurance Branches
FSA	Financial Sector Assessment
FSAP	Financial Sector Assessment Program
FSDC	Financial Stability and Development Council
FSR	Financial Stability Report

FSSA	Financial System Stability Assessment Report
FSSI	Financial System Stress Indicator
FTAs	Free Trade Agreements
FTKs	Field Testing Kits
FTTH	Fibre to the home
FY	Financial Year
FY	Financial Year
GBS	Gender Budget Statement
GBS	Gross Budgetary Support
GCA	gross cropped area
GCCs	Global Capability Centres
GCP	Green Credit Programme
GCT	GatiShakti Multi-Modal Cargo Terminal
GDP	Gross Domestic Product
GEC	Green Energy Corridor
GeM	Government e-Marketplace
GER	Gross Enrolment Ratio
GERD	Gross Expenditure on Research and Development
GFC	Global Financial Crisis
GFCF	Gross Fixed Capital Formation
GHE	Government Health Expenditure
GHG	Greenhouse Gases
GI Cloud	Government of India Cloud
GIFT City	Gujarat International Finance Tec-City
GII	Global Innovation Index
GNI	Gross National Income
GNPA	Gross Non-Performing Assets
GoI	Government of India
Govt.	Government
GP	Gram Panchayat
GPAI	Global Partnership on Artificial Intelligence
GPDP	Gram Panchayat Development Plan
GPs	Gram Panchayats
GSDP	Gross State Domestic Product
GSLV	Geosynchronous Satellite Launch Vehicle
GST	Goods and Services Tax
GST	Global Stocktake
GT	Gross Tonnage
GTR	Gross Tax Revenue
GVA	Gross Value Added
GVA	Gross Value Added
GVCs	Global Value Chains

GW	Gigawatt
GWeq	Giga Watt Equivalent
GWMR	Groundwater Management & Regulation
GWs	Giga Watts
HAL	Hindustan Aeronautics Limited
HAM	Hybrid Annuity Model
HCES	Household Consumption Expenditure Survey
HEI	Higher Education Institution
HFC	Housing Finance Companies
HHI	Hershman-Herfindahl Index
HKKP	Har Khet Ko Pani
HML	Harmonized List
HNIs	High Net Worth Individuals
HR	Human Resources
IBA	Indian Banks' Association
IBC	Insolvency and Bankruptcy Code
IBC	Insolvency and Bankruptcy Code
IBP route	Indo Bangladesh Protocol route
ICAO	International Civil Aviation Organization
ICAR	Indian Council for Agriculture Research
ICDR	Issue of Capital and Disclosure Requirements
ICDS	Integrated Child Development Services
ICRIER	Indian Council for Research on International Economic Relations
ICT	Information and Communications Technology
IDRCL	India Debt Resolution Company Ltd.
IEBR	Internal and Extra Budgetary Resources
IET	International Emissions Trading
IFRS	International Financial Reporting Standards
IFSC	International Financial Services Centre
IFSC GIFT City	International Financial Services Centre, Gujarat International Finance Tec-City
IFSCA	International Financial Services Centres Authority
IHHL	Individual Household Latrine
IIE	Indian Institute of Entrepreneurship
IIG	India Investment Grid
IIP	International Investment Position
IIP	Index of Industrial Production
IIPDF	India Infrastructure Project Development Fund
IIT	Indian Institute of Technology
IITM	Indian Institute of Technology, Madras
ILIMS	Integrated Land Information Management System
IMC	Indore Municipal Corporation
IMEC	India-Middle East Europe Corridor

IMEs	Informal Micro Enterprises
IMF	International Monetary Fund
India-WRIS	India – Water Resource Information System
Infra	Infrastructure
IN-SPACe	Indian National Space Promotion and Authorisation Centre
INSTC	International North-South Transport Corridor
InvITs	Infrastructure Investment Trusts
IoT	Internet of Things
IPOs	Initial Public Offers
IR	Indian Railways
IRCTC	Indian Railway Catering and Tourism Corporation Limited
IRDAI	Insurance Regulatory and Development Authority of India
IRFC	Indian Railway Finance Corporation
IRIS	Infrastructure for Resilient Island States
ISA	International Solar Alliance
ISAM	Integrated Scheme for Agricultural Marketing
ISRO	Indian Space Research Organisation
IT	Information Technology
ITI	Industrial Training Institute
ITMOs	Internationally Transferred Mitigation Outcomes
IVA	Independent Verification Agency
IWAI	Inland Waterways Authority of India
IWT	Inland Water Transport
JAM	Jan Dhan-Aadhaar-Mobile
JEE	Joint Entrance Examination
JJM	Jal Jeevan Mission
JLG	Joint Liability Group
JLGs	Joint Liability Groups
JSS	Jan Shikshan Sansthan
KCC	Kisan Credit Card
KLD	Kilo liters per day
KP	Kyoto Protocol
Krishi-DSS	Krishi Decision Support System
KWh	Kilowatt-hour
L&T	Larsen & Toubro
LAMA	Log Analytics and Monitoring Application
LAMP	Large Area Multipurpose Societies
LCAF	Lower Carbon Aviation Fuels
LCOE	Levelised Cost of Electricity
LCR	Liquidity Coverage Ratio
LeadIT	Leadership Group for Industry Transition
LEADS	Logistics Ease Across Different States

LED	Light-Emitting Diode
LEDP	Livelihood & Enterprise Development Programmes
LFPR	Labour Force Participation Rate
LH&DC	Livestock Health and Disease Control
LiFE	Lifestyle for Environment
LMT	Lakh Metric Tons
LPAI	Land Ports Authority of India
LPG	Liquified Petroleum Gas
LPG	Liquified Petroleum Gas
LPI	Logistics Performance Index
LT	Lakh tonnes
Ltd.	Limited
LT-LEDS	Long-Term Low Emission Development Strategy
LVM3	Launch Vehicle Mark-3
M&As	Mergers and Acquisitions
MAHSR	Mumbai-Ahmedabad High Speed Rail
MAIS	Market Access Initiatives Scheme
MAM	Moderate Acute Malnutrition
MANAS	Mental Health and Normalcy Augmentation System
MCA	Ministry of Corporate Affairs
MCA	Model Concession Agreement
MCX	Multi Commodity Exchange
MEDP	Micro Entrepreneurship Development Programme
MEITY	Ministry of Electronics and Information Technology
MFIs	Microfinance Institutions
MFs	Mutual Funds
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MIF	Micro Irrigation Fund
MIS	Management Information Systems
MMLP	Multi-Modal Logistics Park
MMT	Million Metric Tonne
MNEs	Multinational Enterprises
MoAFW	Ministry of Agriculture and Farmers Welfare
MoE	Ministry of Education
MoHUA	Ministry of Housing & Urban Affairs
MOOC	Massive Open Online Course
MOP	Muriate of Potash
MoRTH	Ministry of Road Transport & Highways
MoSPI	Ministry of Statistics and Program Implementation
MoU	Memorandum of Understanding
MOVCDNER	Mission Organic Value Chain Development for North Eastern Region
MPC	Monetary Policy Committee

MPCE	Monthly Per Capita Expenditure
MPI	Multidimensional Poverty Index
MRLs	Major Rail Links
MRLs	Major Rural Links
MRO	Maintenance, Repair and Overhaul
MSCS	Multi-State Cooperatives
MSF	Marginal Standing Facility
MSME	Micro, Small and Medium Enterprises
MSME	Ministry of Micro, Small and Medium Enterprises
MSP	Minimum Support Prices
MSP	Mineral Security Partnership
MtCO _{2e}	Million Tonnes of CO ₂ Equivalent
MTM	Marked to Market
MTOE	Million Tonnes of Oil Equivalent
MTPA	Million Tonnes Per Annum
MVA	Mega Volt Amp
MWeq	Mega Watt Equivalent
MWs	Mega Watts
NABARD	National Bank for Agriculture and Rural Development
NADCP	National Animal Disease Control Programme
NAFED	National Agricultural Cooperative Marketing Federation of India
NAPCC	National Action Plan on Climate Change
NAPS	National Apprentice Promotion Scheme
NARCL	National Asset Reconstruction Company Ltd.
NAS	National Accounts Statistics
NAS	National Achievement Survey
NASSCOM	National Association of Software and Service Companies
NavIC	Navigation with Indian Constellation
NBFC	Non-Banking Financial Company
NBFCs	Non-Banking Financial Companies
NCAP-2016	National Civil Aviation Policy
NCCF	National Cooperative Consumers' Federation of India
NCDC	National Cooperative Development Corporation
NCDEX	National Commodity and Derivative Exchange
NCEL	National Cooperative Exports Limited
NCERT	National Council for Educational Research and Training
NCF-SE	National Curriculum Framework for School Education
NCIP	National Crop Insurance Programme
NCLT	National Company Law Tribunal
NCOL	National Cooperative Organics Limited
NCQG	New Collective Quantified Goal
NCR	National Capital Region

NCrF	National Credit Framework
NCS	National Career Service
NCTF	National Committee on Trade Facilitation
NCVET	National Council for Vocational Education and Training
NDAAs	Non-Disclosure Agreements
NDCs	Nationally Determined Contributions
NDLM	National Digital Livestock Mission
NDTSP	National Deep Tech Start-up Policy
NEER	Nominal Effective Exchange Rate
NEET	National Eligibility cum Entrance Test
NEP	National Education Policy
NEP	National Electricity Plan
NFA	Net Foreign Assets
NFHS	National Family Health Survey
NFSA	National Food Security Act
NFSM	National Food Security Mission
NFSM-OS&OP	National Food Security Mission- Oilseeds & Oil Palm
NGOs	Non-Government Organisations
NH	National Highways
NHA	National Health Accounts
NHAI	National Highways Authority of India
NHB	National Housing Bank
NHs	National Highways
NIDHI	National Integrated Database of Hospitality Industry
NIESBUD	National Institute for Entrepreneurship and Small Business Development
NII	Net Interest Income
NIM	Net Interest Margin
NIP	National Infrastructure Pipeline
NITI	National Institution for Transforming India
NLBC	Narayanpur Left Bank Canal
NLM	National Livestock Mission
NLP	National Logistics Policy
NMCE	National Multi Commodity Exchange
NMCG	National Mission on Clean Ganga
NMHS	National Mental Health Survey
NMP	National Monetisation Pipeline
NMSA	National Mission for Sustainable Agriculture
Non-Conv	Non-Conventional
NPCI	National Payments Corporation of India
NPDD	National Programme for Dairy Development
NPK	nitrogen, phosphorus, and potassium
NPP	National Perspective Plan

NPS	National Pension Scheme
NRLM	National Rural Livelihood Mission
NSDL	National Securities Depository Limited
NSIL	New Space India Limited
NSQF	National Skills Qualification Framework
NSSO	National Single Sign-On
NSTI	National Skill Training Institute
NSVA	Nari Shakti Vandan Abhiniyam
NTR	Non-Tax Revenue
NWs	National Waterways
O&M	Operations and Maintenance
OCEN	Open Credit Enablement Network
OCMS	Online Computerised Monitoring System
ODA	Official Development Assistance
ODF	Open Defecation Free
ODOP	One District One Product
ODR	Online Dispute Resolution
OECD	Organisation for Economic Cooperation and Development
OEM	Original Equipment Manufacturer
OFC	Optical Fiber Cable
OFPO	Off-Farm Producer Organisation
OFSTED	Office for Standards in Education, Children's Services and Skills
OI	Other Interventions
ONDC	Open Network for Digital Commerce
ONGC	Oil and Natural Gas Corporation
ONORC	One Nation One Ration Card
OOI	Other Operating Income
OSOWOG	One Sun One World One Grid
OTC	Over-the-Counter
PA	Provisional Actuals
PACS	Primary Agriculture Credit Societies
PAR	Performance and Accountability Reporting
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
PBPB	Poshan Bhi Padhai Bhi
PCI	Per Capita Income
PDMC	Per Drop More Crop
PE	Provisional Estimates
PFCE	Private Final Consumption Expenditure

PFMS	Public Financial Management System
PFRAI	Pension Fund Regulatory and Development Authority of India
PHC	Primary Healthcare Centre
PHH	Priority Households
PIB	Press Information Bureau
PKVY	Paramparagat Krishi Vikas Yojana
PLFS	Periodic Labour Force Survey
PLI	Production Linked Incentive
PLI Scheme	Production Linked Incentive Scheme
PLISFPI	Production Linked Incentive Scheme for the Food Processing Industry
PM Poshan	Pradhan Mantri Poshan Shakti Nirman
PM SVANidhi	Pradhan Mantri Street Vendor's AatmaNirbhar Nidhi
PMAASHA	Pradhan Mantri Annadata Aay Sanraskhan Abhiyan
PM-AWAS	Pradhan Mantri Awas Yojana
PMAY-U	Pradhan Mantri Awas Yojana - Urban
PMEGP	Prime Minister's Employment Generation Programme
PMFBY	Pradhan Mantri Fasal Bima Yojana
PMFME	PM Formalization of Micro Food Processing Enterprises
PMG	Project Monitoring Group
PMGKAY	Pradhan Mantri Garib Kalyan Anna Yojana
PMGKAY	Pradhan Mantri Garib Kalyan Anna Yojana
PMGKY	P M Gareeb Kalyan Yojana
PMGS-NMP	PM GatiShakti National Master Plan
PMGSY	Pradhan Mantri Gram Sadak Yojana
PMI	Purchasing Managers' Index
PMJJBY	Pradhan Mantri Jeevan Jyoti Bima Yojana
PMJJY	PM Jeevan Jyoti Yojana
PM-KISAN	Pradhan Mantri Kisan Samman Nidhi
PMKMY	Pradhan Mantri Kisan Maandhan Yojna
PMKSY	Pradhan Mantri Kisan SAMPADA Yojana
PMKSY	Pradhan Mantri Krishi Sinchayee Yojana
PM-KUSUM	Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan
PMKVY	Pradhan Mantri Kaushal Vikas Yojana
PM-PRANAM	PM Programme for Restoration, Awareness Generation, Nourishment & Amelioration of Mother Earth
PMSBY	Pradhan Mantri Suraksha Bima Yojana
PM-SHRI	Pradhan Mantri Schools for Rising India
PM-SYM	Pradhan Mantri Shram Yogi Maan-Dhan
POL	Petroleum, Oil and Lubricants
PPP	Public Private Partnership
PPPAC	Public Private Partnership Appraisal Committee
PRAGATI	Pro-Active Governance and Timely Implementation

PRASHAD	Pilgrimage Rejuvenation and Spiritual Augmentation Drive
PRAYAG	Platform for Real-time Analysis of Yamuna, Ganga, and their tributaries
PSF	Price Stabilization Fund
PSLV	Polar Satellite Launch Vehicle
PSP	Pumped Storage Project
PSU	Public Sector Undertaking
PV	Photovoltaic
Pvt.	Private
PVTG	Particularly Vulnerable Tribal Groups
QIPs	Qualified Institutional Placements
R&D	Research And Development
R&D	Research & Development
RAD	Rainfed Area Development
RBCF	Risk-Based Capital Framework
RBI	Reserve Bank of India
RBSF	Risk-Based Supervisory Framework
RCS	Regional Connectivity Scheme
RDN	Recommended Dose of Nutrients
RDSS	Revamped Distribution Sector Scheme
RE	Renewable Energy
RE	Revised Estimates
REER	Real Effective Exchange Rate
REEs	Rare Earth Elements
REITs	Real Estate Investment Trusts
REN21	Renewable Energy Policy Network for the 21st Century
RERA	Real Estate (Regulation and Development) Act
RF testing	Radio Frequency Testing
RFID	Radio Frequency Identification
RGM	Rashtriya Gokul Mission
RIS	Research and Information System
rkm	route kilometre
RKVY	Rashtriya Krishi Vikas Yojana
RMBS	Residential Mortgage-Backed Securities
RMS	Rabi Marketing Season
RoA	Return on Asset
RoE	Return on Equity
RPL	Recognition of Prior Learning
RRTS	Regional Rapid Transit System
RSETI	Rural Self Employment Training Institute
RTC	Round-The-Clock
SaaS	Software as a Service
SAATHI	System for Assessment, Awareness and Training for Hospitality Industry

SAF	Sustainable Aviation Fuel
SAM	Severe Acute Malnutrition
SAMARTH	Sustainable Agrarian Mission on Use of Agri-Residue in Thermal Power Plant
SAPCC	State Action Plan on Climate Change
SARFAESI	Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest
SBM-G	Swachh Bharat Mission – Grameen
SCBs	Scheduled Commercial Banks
SCM	Smart Cities Mission
SCO	Shanghai Cooperation Organisation
SCRA	Securities Contracts Regulation Act
SDF	Standing Deposit Facility
SDG	Sustainable Development Goals
SDGs	Sustainable Development Goals
SDSC-SHAR	Satish Dhawan Space Centre Sriharikota
SEBI	Securities and Exchange Board of India
SEWA	Self Employed Women’s Association
SEZs	Special Economic Zones
SFAC	Small Farmers’ Agri-Business Consortium’s
SFBs	Small Finance Banks
SFT	Securities Financing Transactions
SHC	Secondary Healthcare Centre
SHG	Self Help Group
SHG-BLP	SHG-Bank Linkage Programme
SHGs	Self Help Groups
SIBs	Systematically Important Banks
SIDBI	Small Industries and Development Bank of India
SIIC	Skill India International Centre
SKUs	Stock Keeping Units
SLR	Statutory Liquidity Ratio
SMAM	Sub Mission on Agricultural Mechanization
SMR	Small Modular Reactors
SO ₂	Sulphur Dioxide
SP	Special Projects
SPECS	Scheme For Promotion of Manufacturing of Electronic Components And Semiconductors
SPS	Sanitary and Phytosanitary
SPSEs	State Public Sector Enterprises
SPVs	Special Purpose Vehicles
SRB	Sex Ratio at Birth
SROs	Self-Regulatory Organisations
SRS	Spectrum Regulatory Sandbox
SSE	Social Stock Exchange

SSLV	Small Satellite Launch Vehicle
STARS	Strengthening of Teaching-Learning and Results for States
STEM	Science, Technology, Engineering, and Mathematics
STPs	Sewage Treatment Plants
STT	Short-Term Training
SVAMITVA	Survey of Villages and Mapping with Improvised Technology in Village Areas
SVEP	Startup Village Entrepreneurship Programme
SWAMIH	Special Window for Affordable and Mid-Income Housing
SWAMIH	Special Window for Affordable and Mid-Income Housing
SWAYAM	Study Webs of Active Learning for Young Aspiring Minds
SWIFT	Single Window Interface for Facilitation of Trade
TAs	Transaction Advisors
TBT	Technical Barriers to Trade
Telecom	Telecommunications
TEPA	Trade and Economic Partnership Agreement
THE	Total Health Expenditure
TIES	Trade Infrastructure for Export Scheme
TPA	Tri-Partite Agreement
TPD	Tonnes Per Day
TReDS	Trade Receivables Discounting System
TTDI	Travel and Tourism Development Index
UAE	United Arab Emirates
UDAN	Ude Desh Ka Aam Nagrik
UGC	University Grants Commission
UHWC	Urban Health and Wellness Centre
UJALA	Unnat Jyoti by Affordable LEDs for ALL
ULBs	Urban Local Bodies
ULIP	Unified Logistics Interface Platform
ULLAS	Understanding of Lifelong Learning for All in Society
ULPIN	Unique Land Parcel Identification Number
UMANG	Unified Mobile Application for New-age Governance
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNESCAP	United Nations Economic and Social Commission for Asia Pacific
UNFCCC	United Nations Framework Convention on Climate Change
UNFPA	United Nations Fund for Population Activities
UNICEF	United Nations Children's Fund
UPHC	Urban Primary Health Centre
UR	Unemployment Rate
URP	Udyam Registration Portal
USD	United States Dollar

USOF	Universal Services Obligation Fund
UT	Union Territories
UVs	Utility Vehicles
VBSY	Viksit Bharat Sankalp Yatra
VCM	Voluntary Carbon Market
VGf	Viability Gap Funding
Viz.	Videre Licet (Namely)
VRR	Variable Repo Rate
VRRR	Variable Rate Reverse Repo
WASH	Water, Sanitation and Hygiene
WEF	World Economic Forum
WEO	World Economic Outlook
WHO	World Health Organization
Wi-Fi	Wireless Fidelity
WINDS	Weather Information Network & Data System
WIPO	World Intellectual Property Organisation
WISE-KIRAN	Women in Science and Engineering -Knowledge Involvement in Research Advancement for Nurturing
WiTe Zones	Wireless Test Zones
WITS	World Integrated Trade Solutions
WPI	Wholesale Price Index
WPR	Worker Population Ratio
WQMIS	Water Quality Management Information System
WSA	Wayside Amenities
WTO	World Trade Organisation
YES-Tech	Yield Estimation Based on Technology
YoY	Year-on-Year
YoY	Year-on-Year
ZCZP	Zero Coupon, Zero Principal

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STATE OF THE ECONOMY: STEADY AS SHE GOES

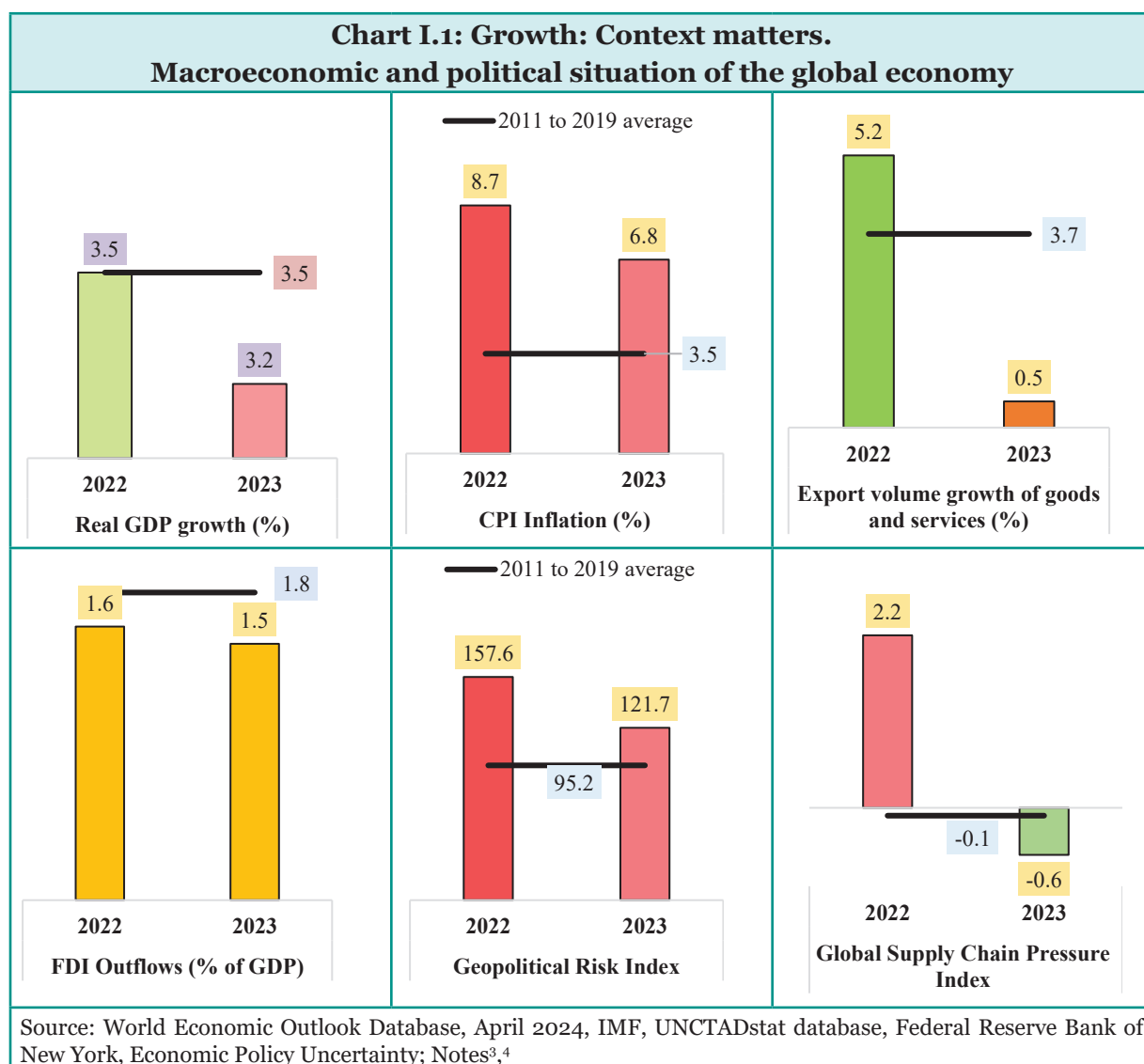
India's calibrated response to the pandemic on the economic front included three salient components. The first has been the focus on public spending on infrastructure, which kept the economy afloat by creating a strong demand for jobs and industrial output and triggered a lagged yet vigorous private investment response. Stronger balance sheets of the financial and non-financial private sector helped, aided by a decade of supporting initiatives by the Government and the Reserve Bank of India. The second has been partly a natural response of business enterprise and public administration amidst adversities, i.e., digitalisation of service delivery. The public policy focus and nurturing of processes and frameworks in digital technology greatly helped this irreversible and transformational change. The third has been embodied in the Atmanirbhar Bharat Abhiyan in terms of targeted relief to different sectors of the economy and sections of the population, and structural reforms that assisted a firm recovery and increased the medium-term growth potential.

Global troubles, supply chain disruptions, and vagaries of monsoons intermittently stoked domestic inflationary pressures, which were, to a great extent, managed by administrative and monetary policy responses. The fiscal balances of the general government—central and State Governments taken together - have improved progressively despite expansionary public investment. Tax compliance gains driven by procedural reforms, expenditure restraint, and increasing digitisation helped India achieve this fine balance. The external balance has been pressured by subdued global demand for goods, but strong services exports largely counterbalanced this. Global output is now somewhat more resilient than in 2022, inflationary pressures are shrinking, and trade is set to recover, should there be no further geo-political shocks or flare-ups. However, the chances of geopolitical disturbances and conflicts have only gone up in recent times.

The net impact of these developments has been that the Indian economy recovered and expanded in an orderly fashion in the last three years. The real GDP in FY24 was 20 per cent higher than its level in FY20, a feat that only a very few major economies achieved, while also leaving a strong possibility for robust growth in FY25 and beyond. Growth has been inclusive with a reduction in unemployment and multi-dimensional poverty and an increase in labour force participation. Overall, the Indian economy looks forward to FY25 optimistically, anticipating broad-based and inclusive growth.

GLOBAL ECONOMIC SCENARIO

1.1 After a year marked by global uncertainties and volatilities, the global economy achieved greater stability in 2023. While uncertainty stemming from adverse geopolitical developments remained elevated, global economic growth was surprisingly robust. As per the World Economic Outlook (WEO), April 2024 of the International Monetary Fund (IMF)¹, the global economy registered a growth of 3.2 per cent in 2023, though marginally lower than in 2022² and average



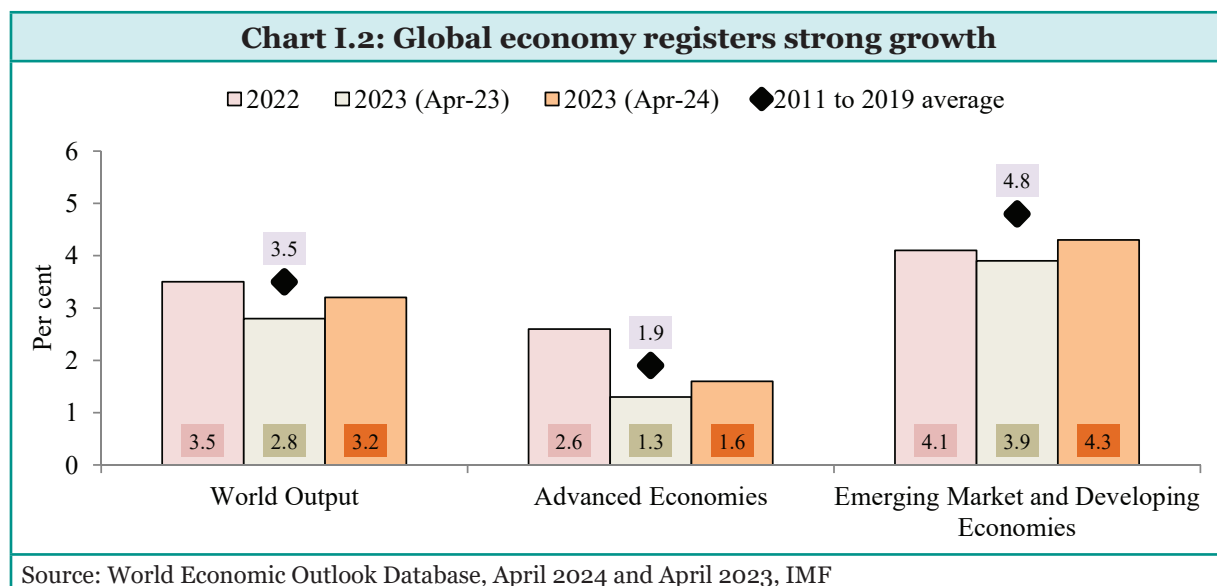
1 International Monetary Fund, World Economic Outlook, April 2024, page 10 (<https://tinyurl.com/38cuxrbw>)

2 International Monetary Fund, World Economic Outlook, October 2023, page 12 (<https://tinyurl.com/y3xdpctk>)

3 Geopolitical Risk Index is based on a tally of newspaper articles covering geopolitical tensions. Ten newspapers are considered. The index is calculated by counting the number of articles related to adverse geopolitical events in each newspaper for each month (as a share of the total number of news articles). A lower value indicates lower risk.

4 Global Supply Chain Pressure Index readings measure standard deviations from the index's historical average. A higher value indicates increased supply chain pressure.

for 2011-19 but higher compared to the projection of 2.8 per cent as per the April 2023 WEO⁵. The context in which the growth of 3.2 per cent in 2023 has been achieved is markedly different compared to the 2011-19 period. Inflationary pressures have been significantly higher on account of the persistence of core inflation. Global trade moderated due to rising geopolitical tensions, cross-border restrictions and slower growth in advanced economies (AEs). The muted trade growth occurred despite the easing of supply chain pressures. Further, geopolitical developments and monetary policy changes across countries resulted in increased caution among investors, culminating in moderation in foreign direct investment (FDI) flows.



1.2 Both emerging market economies (EMEs) and AEs achieved higher growth in 2023 than projected a year ago. Almost all major economies have surpassed the pre Covid-19 pandemic (hereinafter as pandemic) real gross domestic product (GDP) levels in 2023. However, growth has been diverse across countries, raising prospects of increasing divergences. Some economies, including India and China, have attained GDP levels 20 per cent higher in 2023 compared to 2019 levels. Among AEs, the US witnessed continued growth momentum. However, economic activity remains subdued in the Euro area, although the magnitude of the downturn has eased.

1.3 The stark difference in the economic performance of countries has been on account of domestic structural issues, uneven exposure to geopolitical conflicts and the impact of monetary policy tightening. The economic shocks resulting from the Russia-Ukraine conflict had an outsized impact on Europe, leading to subdued growth in large countries like Germany and France. The US also faced high inflationary pressures and consequently raised the policy rates substantially. But, the pass-through to outstanding household mortgages was limited on account of the high share of fixed-rate mortgages and corporate debt being termed out at fixed

⁵ International Monetary Fund, World Economic Outlook, April 2023, page 9 (<https://tinyurl.com/2empx2dn>)

rates⁶, limiting the impact of higher policy rates on economic activity⁷. India registered a steep decline in economic growth during the pandemic but recovered swiftly, aided by strong private consumption and government impetus to infrastructure investment. China, on the other hand, had only a slight moderation in growth during the pandemic on account of swift policy actions, including a high vaccination rate⁸, but growth has slowed subsequently due to structural issues. Japan, post-pandemic, went through subdued growth but is expected to turn around in 2024, driven by a weak yen and improved consumer spending.

Chart I.3: All major economies have surpassed pre-pandemic GDP levels

	Year in which crossed pre pandemic GDP (constant prices, national currency)	Ratio of GDP (constant prices, national currency) in 2023 to corresponding level in 2019
Brazil	2021	107
China	2020	120
France	2022	102
Germany	2022	101
India	2021	120
Indonesia	2021	112
Italy	2022	103
Japan	2023	101
Mexico	2022	104
South Africa	2022	101
Thailand	2023	100
United Kingdom	2022	102
United States	2021	108

Source: World Economic Outlook Database, April 2024, IMF, National Accounts Statistics, Ministry of Statistics and Programme implementation; Note: In IMF data, for India 2021 represents 2021-22 (FY22)

1.4 Apart from GDP estimates, other indicators tracking the performance of the economy also point towards growth resilience. Leading indicators suggest an upturn in global economic activity. The JP Morgan global composite Purchasing Managers' Index (PMI)⁹ registered an uptick since October 2023 with quicker expansion across both manufacturing and service sectors. The JP Morgan global manufacturing PMI has been improving and stood at a 23-month high in May 2024¹⁰.

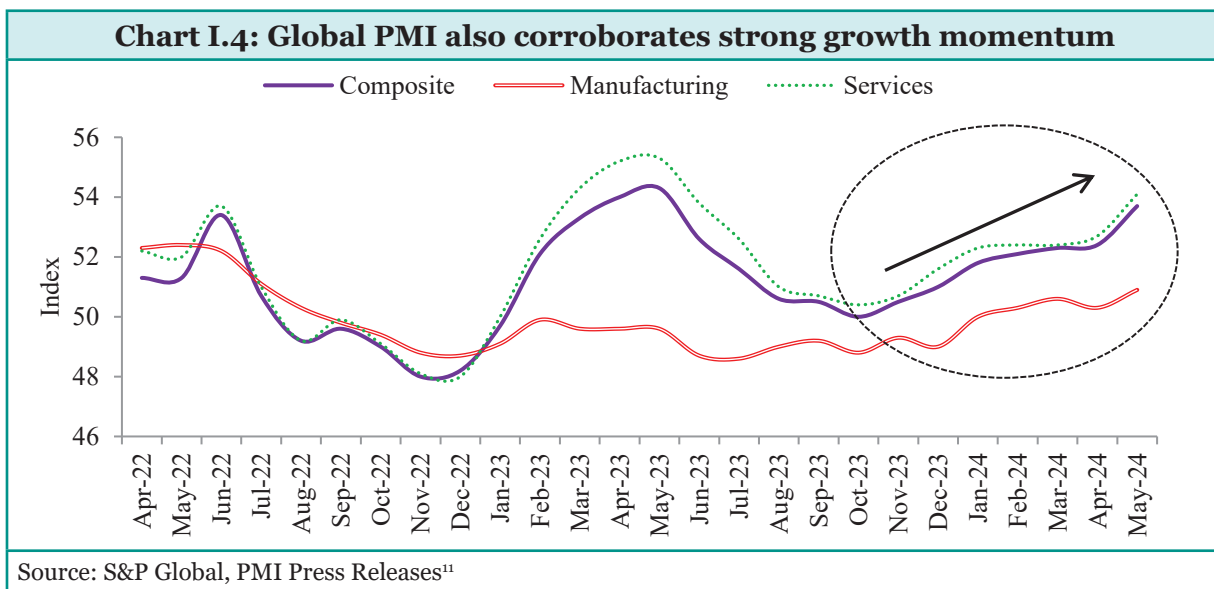
6 Termed out is a financial concept used to describe the transfer of short-term debt to long-term debt, allowing companies to improve their working capital and take advantage of lower interest rates.

7 de Soyres, F., Herrero, J. G. C., Goernemann, N., Jeon, S., Lofstrom, G., & Moore, D. (2024). Why is the US GDP recovering faster than other advanced economies?.

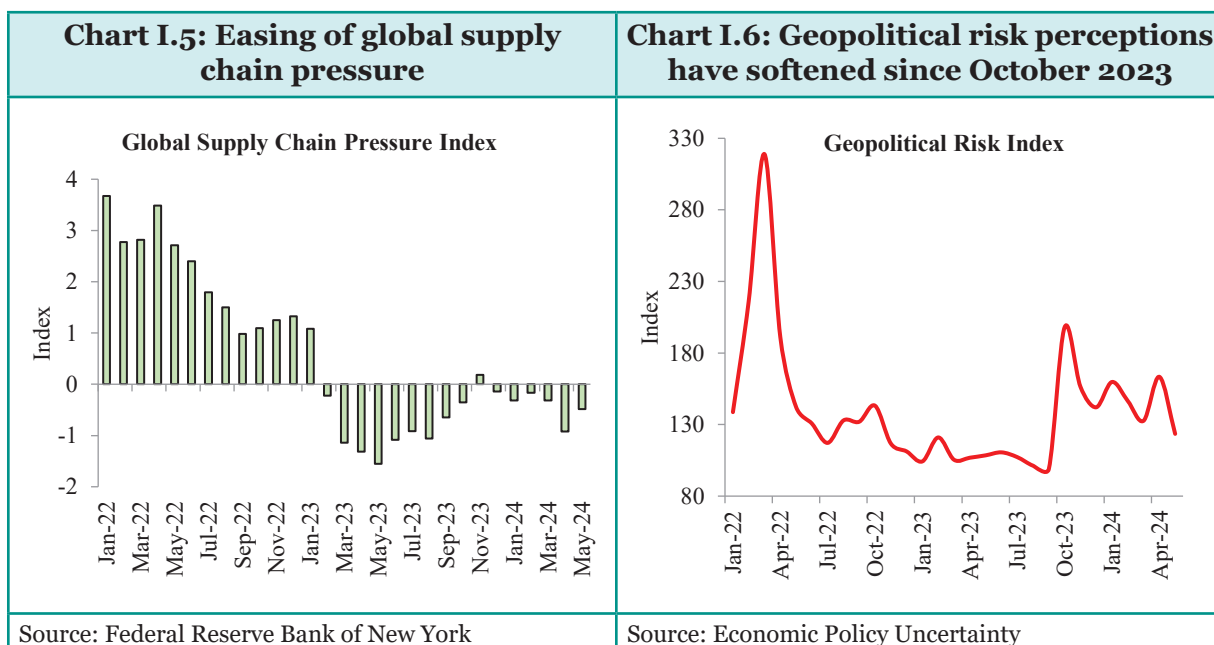
8 People's Republic of China: 2021 Article IV Consultation-Press Release; Staff Report; and Statement by the Executive Director for the People's Republic of China, IMF (<https://tinyurl.com/5456sf94>)

9 J.P.Morgan Global Composite PMI (<https://tinyurl.com/3ddjnymx>)

10 J.P.Morgan Global Manufacturing PMI (<https://tinyurl.com/2uabuyb7>)



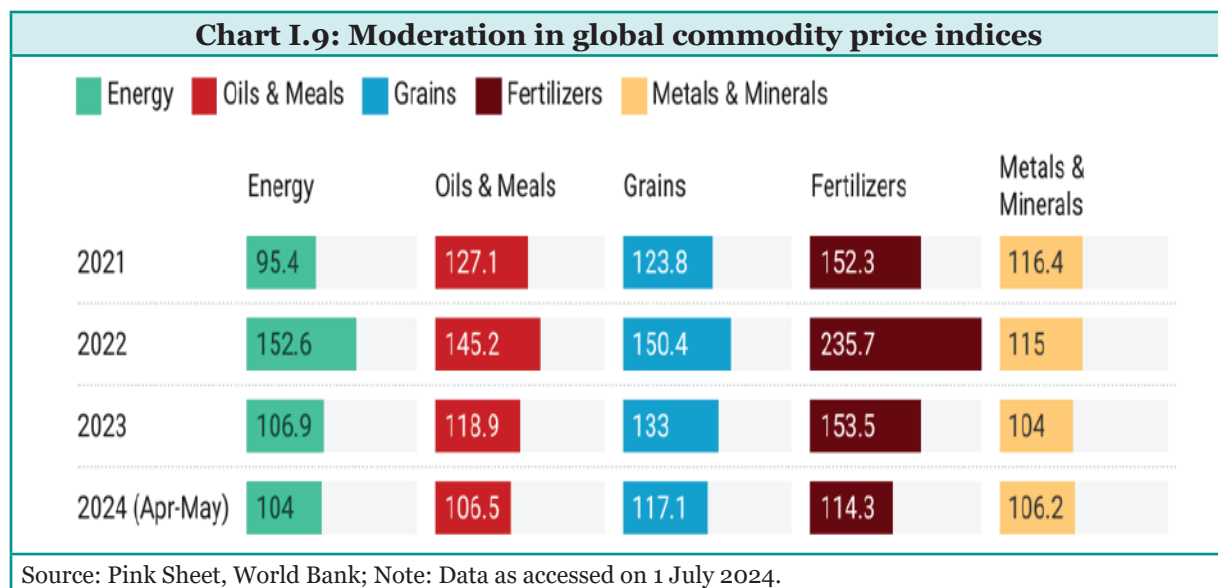
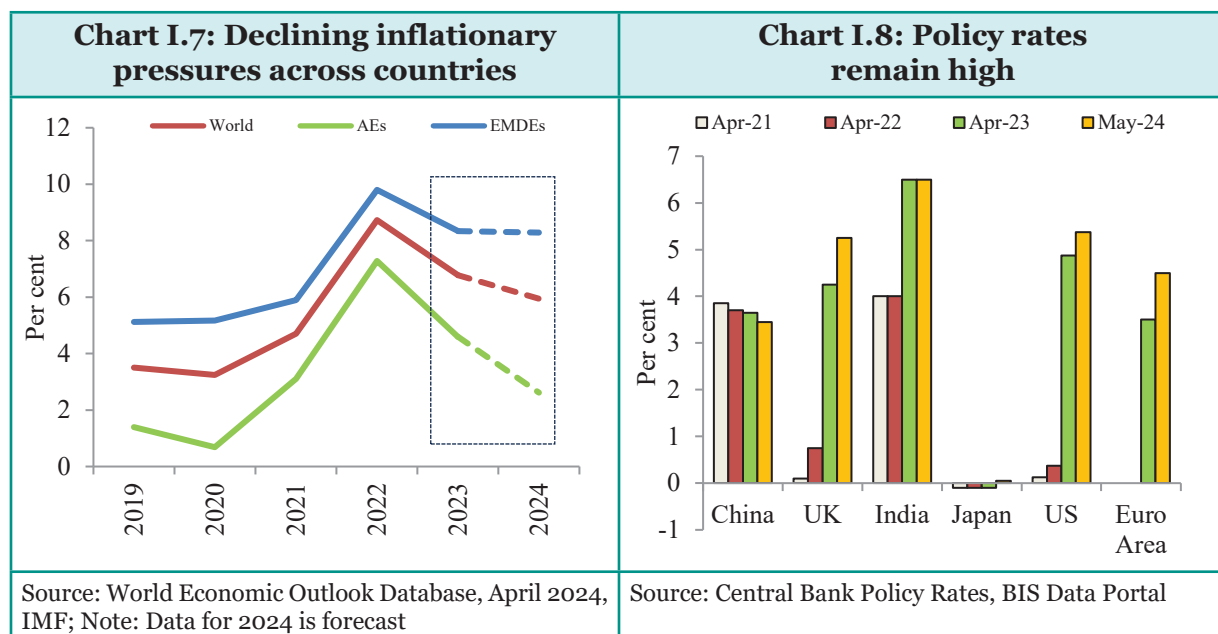
1.5 The escalation of the Red Sea crisis amid heightened geopolitical tensions in the Middle East in October 2023 led to supply chain disruptions, sending ripples to global trade and operations. The attacks on commercial shipping in the Red Sea led to increased global transportation costs, reflecting the rerouting of cargo. However, the increase in supply chain pressures was transient and modest. Similar sentiments were reflected in the softening of risk perceptions. The geopolitical risk index, which spiked after the escalation of the conflict, declined thereafter. However, geopolitical risks are still high and persistent and may worsen in the coming months.



1.6 As the supply chain pressures eased and energy and food price shocks triggered by the Russia - Ukraine conflict faded out, headline inflation across countries declined. After peaking

¹¹ PMI values range between 0 and 100. Value greater than 50 implies expansion. Values below 50 implies contraction.

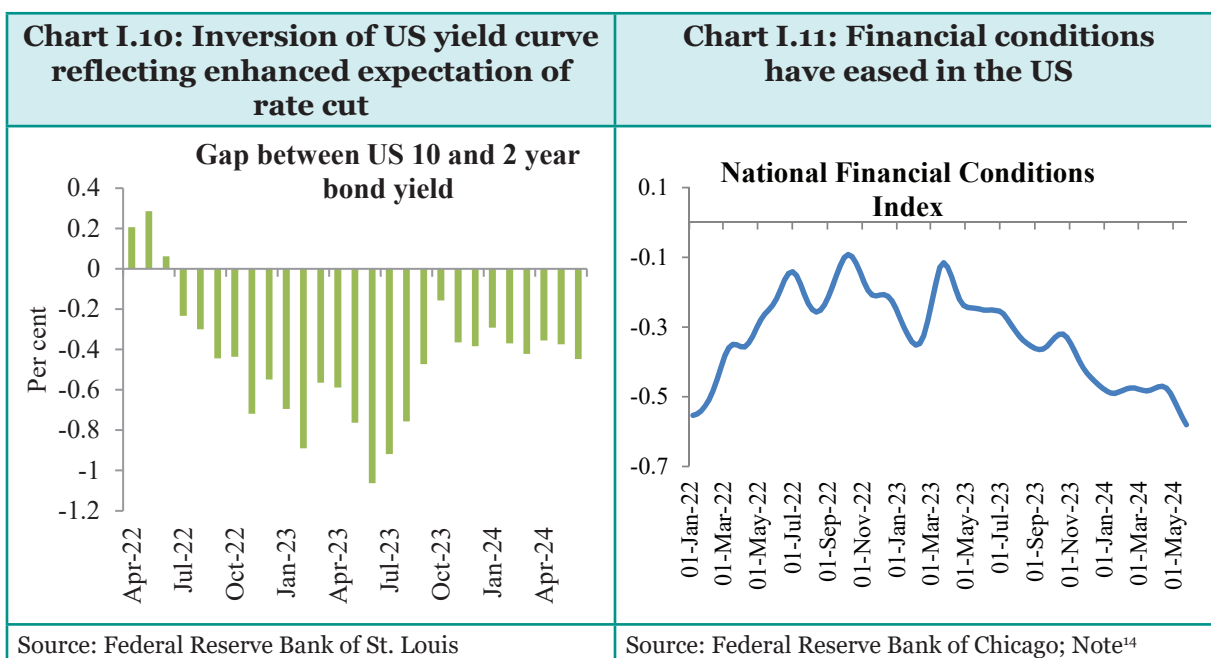
in 2022, inflationary pressures declined considerably in 2023. However, inflation is still above the target in many countries. The easing of supply-chain pressures in tradeable goods in 2023 led to sharp decline in goods inflation in various countries, reducing logistic challenges. Core inflation remained sticky on account of services inflation and a strong labour market, especially in most AEs.¹²



1.7 The persistence of core inflation prompted many central banks to maintain policy rates at a high level or further increase them in 2023, except in China, where the government focussed on giving policy stimulus to revive the economy beset with troubles in the real estate sector. Many central banks have hinted at the peaking of the interest rate hike cycle in recent monetary

¹² BIS Quarterly Review, March 2024 Sectoral price dynamics in the last mile of postCovid-19 disinflation (https://www.bis.org/publ/qtrpdf/r_qt2403.pdf)

policy review meetings. European Central Bank (ECB) became the first major central bank to cut its policy rate, invoking the first rate cut in nearly five years. ECB lowered its benchmark deposit rate by a quarter percentage point in June 2024. The Federal Open Market Committee (FOMC) participants' assessments also indicated rate cuts in 2024, though the projected interest rate cut in the latest FOMC meeting (June 2024)¹³ is lower than that projected in March 2023. Stronger-than-expected labour market data and persistent inflationary pressures have been a major factor behind the Federal Reserve's (the Fed) reluctance to lower rates. As indicated in the FOMC Meeting statements, from early January 2024 onwards, communication by the Fed increasingly pushed back to dispel excessive market optimism. However, market pricing of various financial instruments indicates greater investor conviction in earlier and deeper rate cuts. This is reflected in the inversion of the yield curve (short-term yields are higher than long-term yields), implying investor expectation of future policy rate cuts. Financial market participants have also eyed a much easier stance, as reflected in the significant easing of National Financial Conditions in the US in 2023 compared to March 2022, when the Fed began raising rates. Expansionary fiscal policy and the easing of financial conditions have, to a degree, neutralised the monetary policy tightening of the Fed, leaving unanswered questions on the future trajectory of inflation and the US dollar.

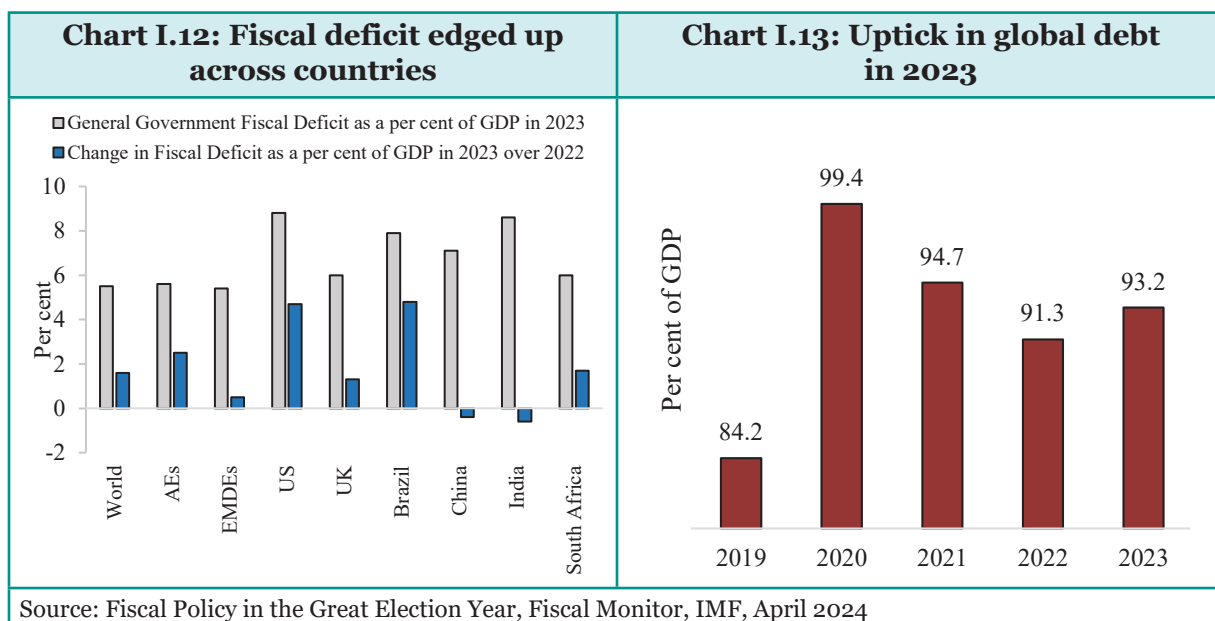


1.8 On the fiscal front, global general government fiscal deficit (as a per cent of GDP) rose by 1.6 percentage points in 2023 compared to last year. This increase primarily stemmed from a year-on-year (YoY) decline in revenues as windfall revenues from inflation for oil-producing

¹³ FOMC Projections materials, June 12, 2024 (<https://tinyurl.com/2574674a>)

¹⁴ The NFCI is constructed to have an average value of zero and a standard deviation of one over a sample period extending back to 1971. Positive values of the NFCI have been historically associated with tighter-than-average financial conditions and vice versa.

and commodity-exporting countries waned while expenditures remained largely stable (IMF Fiscal Monitor, April 2024¹⁵). Consequently, global public debt also inched up in 2023.



1.9 Despite strong global economic growth, as per the WEO data, the global volume of exports of goods and services registered a modest growth of 0.5 per cent in 2023 compared to 2022. The slow growth was driven by lower demand in developed economies and weaker trade in East Asia and Latin America (UNCTAD March Update 2024)¹⁶. High energy prices and inflation weighed heavily on the demand for manufactured goods, resulting in a decline in world merchandise trade volume for 2023. On the other hand, developments in the services trade were more upbeat, partly offsetting the decline in goods trade (WEO, IMF Database, April 2024). Recurring disruptions, especially since the Russia-Ukraine crisis and increased concerns about supply-chain resilience also contributed to the slowdown. There is a reallocation of trade along geopolitical lines, with rising cross-border trade restrictions. About 3,000 new restrictions on trade were introduced in 2023, according to Global Trade Alert data (IMF, WEO, April 2024)¹⁷.

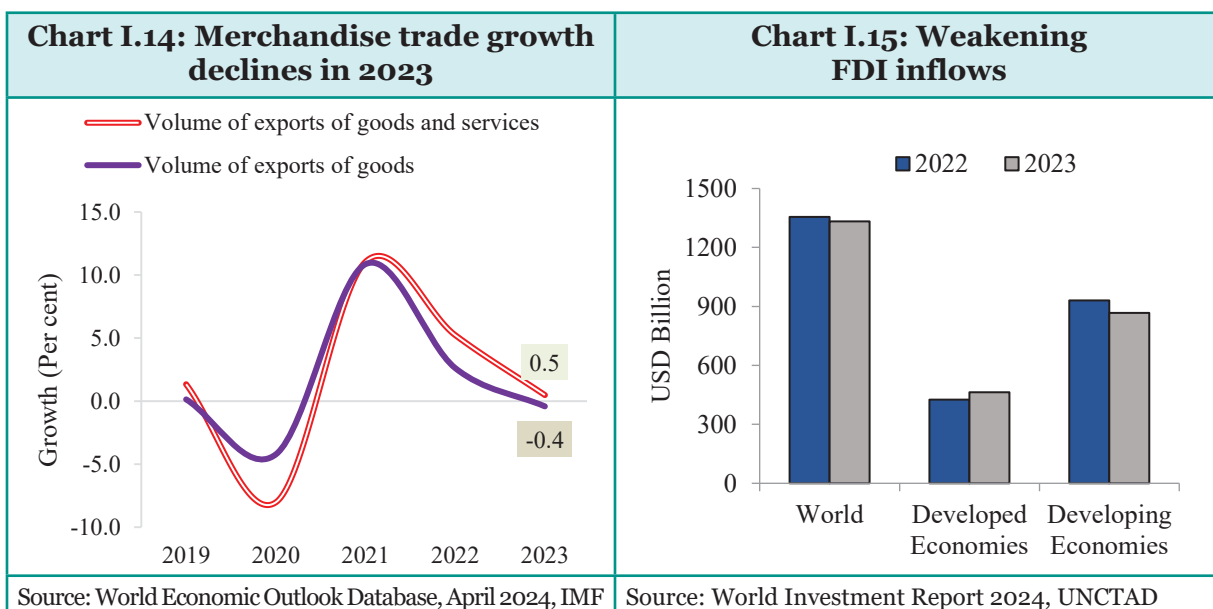
1.10 Concerns regarding geopolitical conflicts, high borrowing costs and global economic fracturing were also reflected in weakening FDI flows. Global FDI flows declined in 2023 compared to 2022¹⁸.

15 Fiscal Policy in the Great Election Year, Fiscal Monitor, IMF (<https://tinyurl.com/bdfxk7c5>)

16 Global Trade Update, March 2024, UNCTAD (<https://tinyurl.com/pe87zewe>)

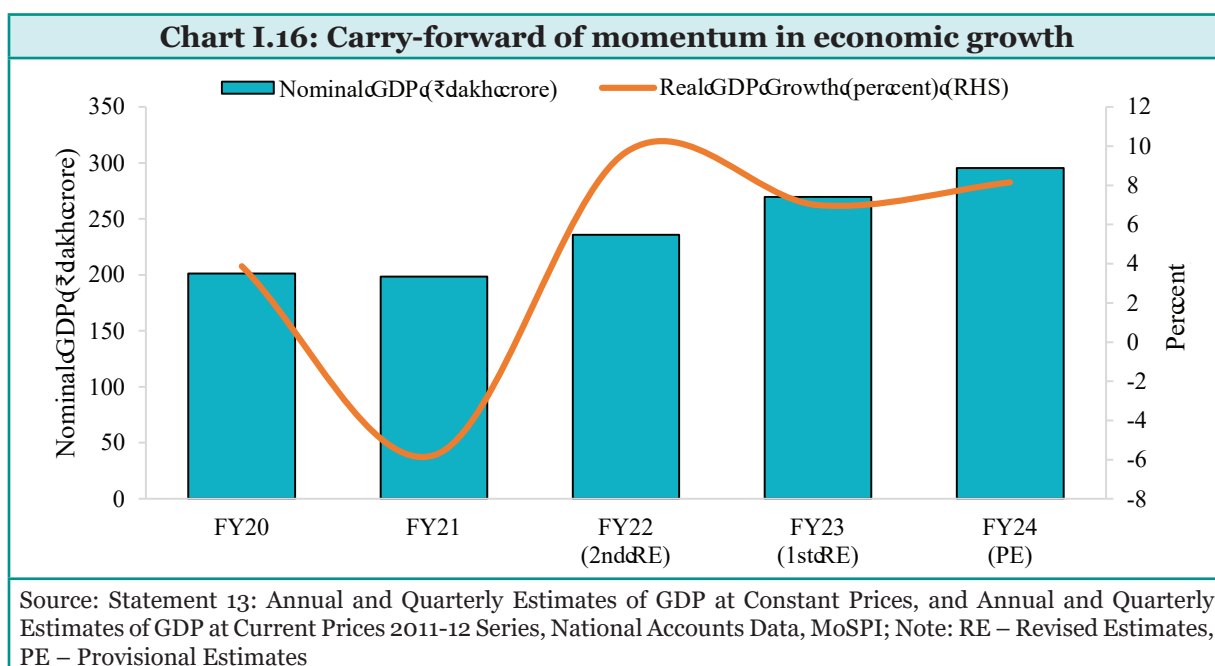
17 World Economic Outlook, April 2024, International Monetary Fund, page 14 (<https://tinyurl.com/38cuxrbw>)

18 World Investment Report 2024, UNCTAD (<https://tinyurl.com/2u48tsuc>)

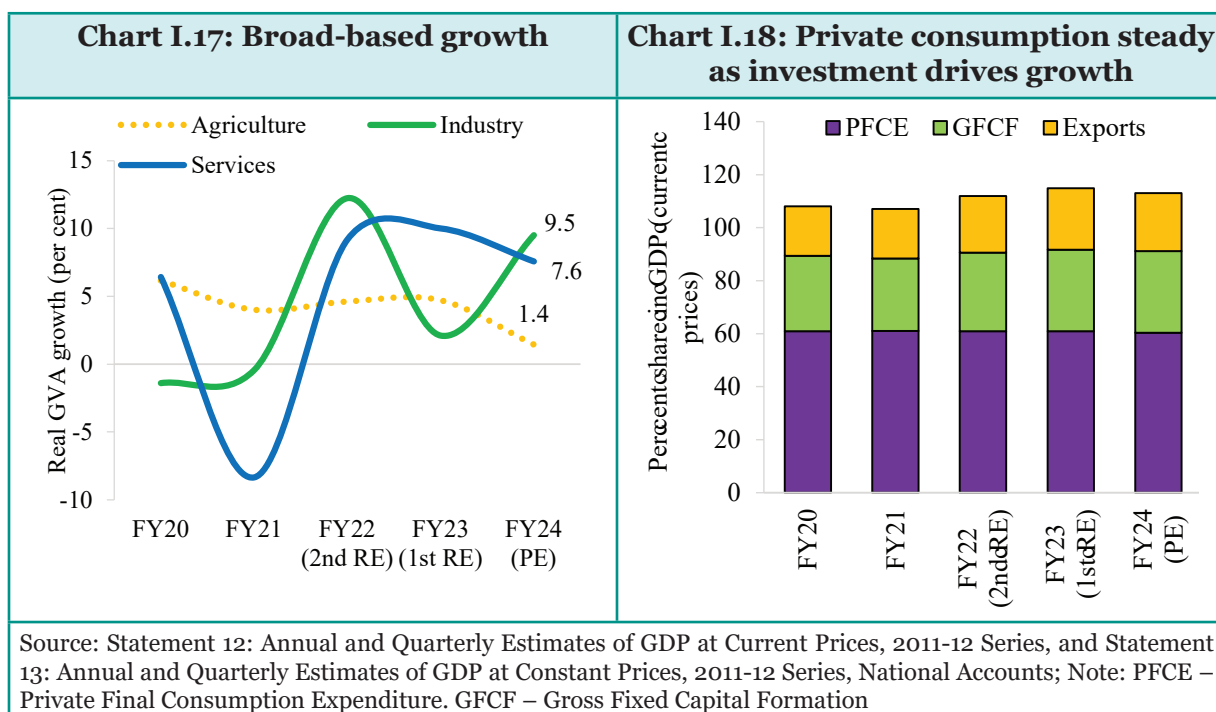


A RESILIENT DOMESTIC ECONOMY

1.11 India's economy carried forward the momentum it built in FY23 into FY24 despite a gamut of global and external challenges. The focus on maintaining macroeconomic stability ensured that these challenges had minimal impact on India's economy. As a result, India's real GDP grew by 8.2 per cent in FY24, posting growth of over 7 per cent for a third consecutive year, driven by stable consumption demand and steadily improving investment demand. On the supply side, gross value added (GVA) at 2011-12 prices grew by 7.2 per cent in FY24, with growth remaining broad-based. Net taxes at constant (2011-12) prices grew by 19.1 per cent in FY24, aided by reasonably strong tax growth, both at the centre and state levels and rationalisation of subsidy expenditure. This led to the difference between GDP and GVA growth in FY24.



1.12 The shares of the agriculture, industry and services sector in overall GVA at current prices were 17.7 per cent, 27.6 per cent and 54.7 per cent respectively in FY24. GVA in the agriculture sector continued to grow, albeit at a slower pace. Erratic weather patterns during the year and an uneven spatial distribution of the monsoon in 2023 impacted overall output. This is reflected in the marginal decline in total foodgrain output for FY24 of 0.3 per cent as per the third advanced estimate of foodgrain production released by the Ministry of Agriculture and Farmers' Welfare (MoAFW).¹⁹



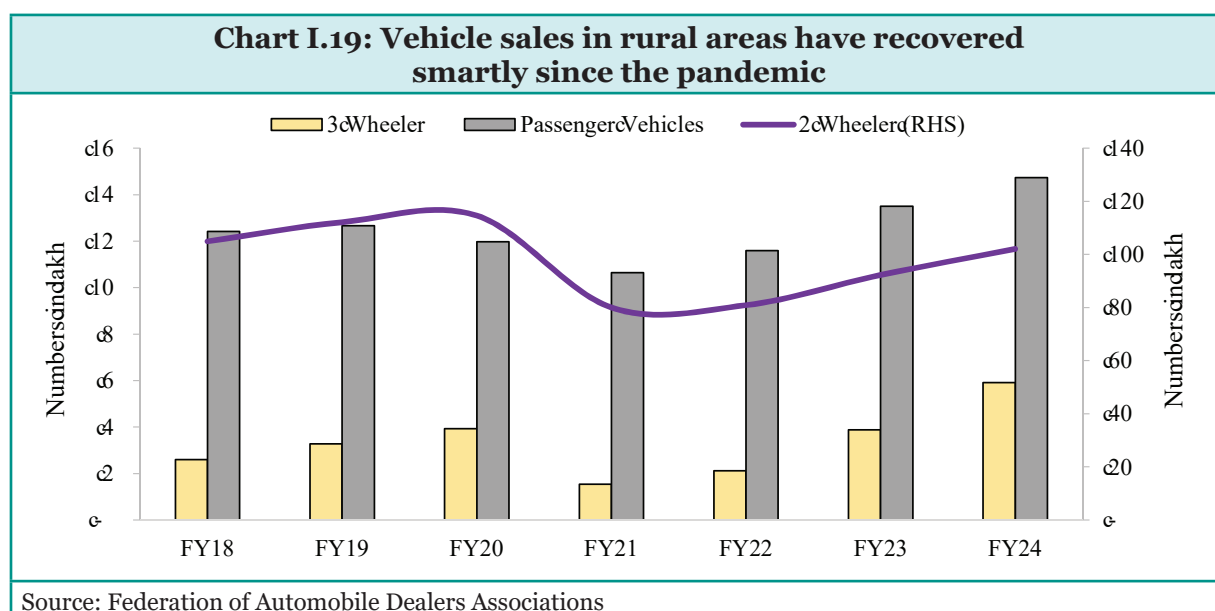
1.13 Within the industrial sector, manufacturing GVA shrugged off a disappointing FY23 and grew by 9.9 per cent in FY24. Manufacturing activities benefitted from reduced input prices while catering to stable domestic demand. The input price advantage was reflected in the subdued growth in the Wholesale Price Index (WPI) inflation, which led to a deflator of (-)1.7 per cent for the manufacturing sector during FY24. Manufacturers also passed on the reduction in input prices to consumers, reflected in the sustained decline in the core consumer price inflation. The strength of manufacturing is further corroborated by the strong performance of the HSBC India PMI for manufacturing, which consistently remained well above the threshold value of 50, indicating sustained expansion and stability in India's manufacturing sector. Construction activities displayed increased momentum and registered a growth of 9.9 per cent in FY24 due to the infrastructure buildout and buoyant commercial and residential real estate demand.

1.14 Various high-frequency indicators reflect the growth in the services sector. Both Goods and Services Tax (GST) collections and the issuance of e-way bills, reflecting wholesale and retail trade, demonstrated double-digit growth in FY24. Financial and professional services

¹⁹ <https://tinyurl.com/2eekevhu>

have been a major driver of growth post the pandemic. Contact-intensive services—prominently trade, transport, real estate and their ancillary services that were impacted the most during the pandemic have emerged much stronger in the post-pandemic period, embedding greater technology and digital content in them and transforming the nature of the service delivery in India. The proliferation of global capability centres (GCCs) has also imparted resilience to India's services exports, giving further thrust to the sector.

1.15 On the demand side, private consumption has been a crucial and steadfast cog in the GDP growth. Private final consumption expenditure (PFCE) grew by 4.0 per cent in real terms in FY24. Urban demand conditions remain strong, as reflected in various urban consumption indicators such as domestic passenger vehicle sales²⁰ and air passenger traffic²¹. It is also reported that rural consumption growth has gradually picked up pace during the quarter ending March 2024.²² As per the Federation of Automobile Dealers Associations, two and three-wheeler and passenger vehicle sales also registered an uptick in FY24.

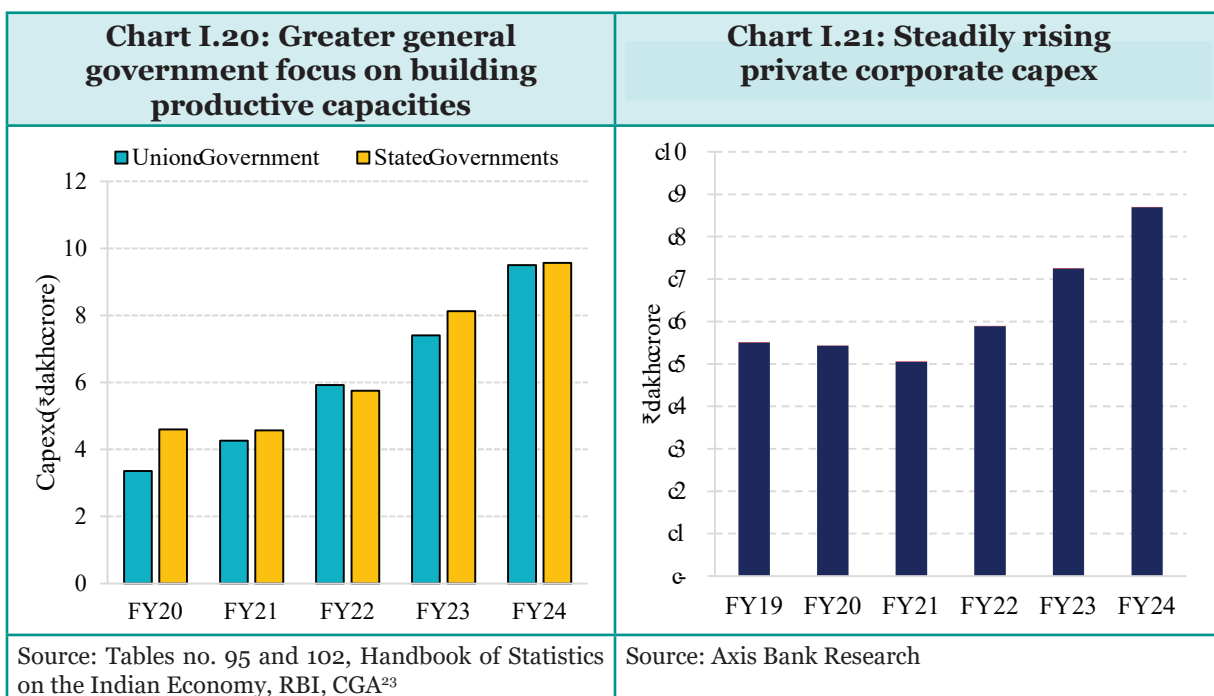


1.16 Gross Fixed Capital Formation (GFCF) continues to emerge as an important driver of growth, as indicated in its rising share of nominal GDP. India is in the midst of a private capex upcycle that has been aided by government capital expenditure. As per Statement 1.11 of the National Accounts Statistics 2024 released by the Ministry of Statistics and Programme Implementation (MoSPI), GFCF by private non-financial corporations increased by 19.8 per cent in FY23. There are early signs that the momentum in private capital formation has been sustained in FY24. As per data provided by Axis Bank Research, private investment across a consistent set of over 3,200 listed and unlisted non-financial firms has grown by 19.8 per cent in FY24.

²⁰ <https://tinyurl.com/y2xhx5bb>

²¹ <https://tinyurl.com/4x9udsdz>

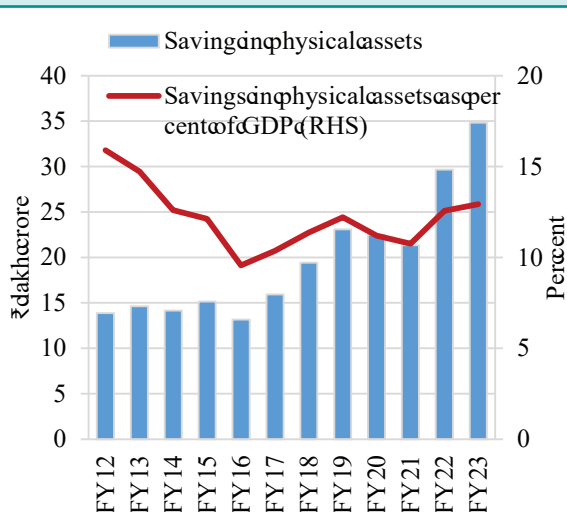
²² <https://tinyurl.com/yjkdpsau>



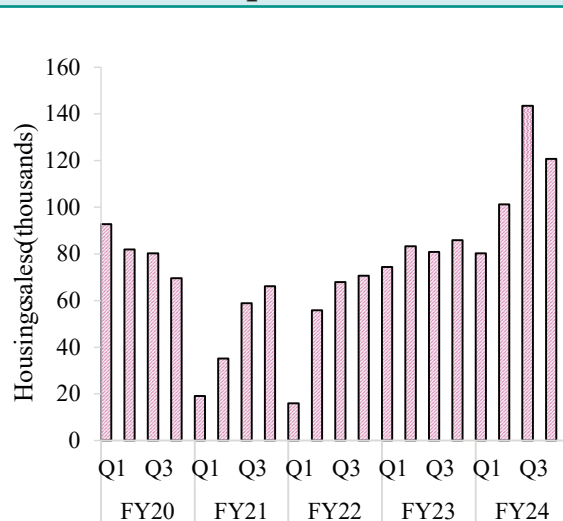
1.17 Apart from private corporations, households have also been at the forefront of the capital formation process. The growth in housing sales in cities has been particularly impressive, indicating that urban households are diversifying the deployment of their savings. In 2023, residential real estate sales in India were at their highest since 2013, witnessing a 33 per cent YoY growth, with a total sale of 4.1 lakh units in the top eight cities. As per real estate research firm Proptiger, new supply witnessed an all-time high, with 5.2 lakh units launched in 2023, as against 4.3 lakh units in 2022. The momentum continued in Q1 of 2024, witnessing record-breaking sales of 1.2 lakh units, clocking a robust 41 per cent YoY growth. New supply has consistently exceeded one lakh units since Q2 of 2022, underscoring persistent demand-supply dynamics in the housing market.

1.18 With cleaner balance sheets and adequate capital buffers, the banking and financial sector is well-positioned to cater to the growing financing needs of investment demand. Credit disbursement by scheduled commercial banks (SCBs) to industrial micro, small and medium enterprises (MSMEs) and services continues to grow in double digits despite a higher base. Similarly, personal loans for housing have surged, corresponding to the increase in housing demand. However, credit offtake by large industries seems to be growing at a lower albeit stable pace. These larger industries seem to be tapping the corporate bond market. Corporate bond issuances in FY24 were up by 70.5 per cent, with private placement remaining the preferred channel for corporates. Outstanding corporate bonds were up by 9.6 per cent (YoY) as of the end of March 2024.

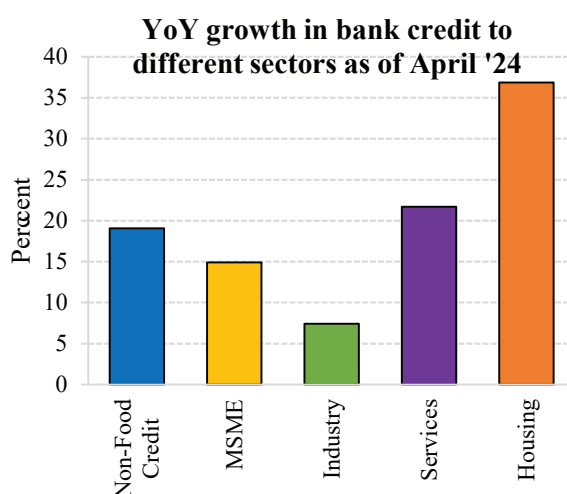
²³ FY24 figures for the Union Government are Provisional Actuals released by CGA; FY24 figures for State Governments are Budget Estimates and FY23 values are Revised Estimates.

Chart I.22: Increased household savings in the form of physical assets

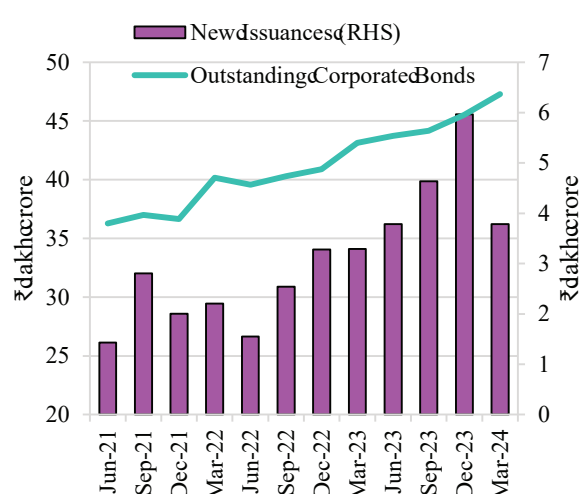
Source: Statement 1.9, National Accounts Statistics 2024, MoSPI

Chart I.23: Record housing sales in top 8 cities²⁴

Source: Various Proptiger Reports²⁵

Chart I.24: SCBs catering to investment demand

Source: Table 170, Sectoral Deployment of Bank Credit, Handbook of Statistics on Indian Economy, RBI

Chart I.25: Large corporates tapping corporate bond markets

Source: Outstanding Corporate bonds, SEBI

1.19 Global trade growth slowed in 2023, leading to a marginal decline in merchandise exports growth. As merchandise imports slowed more than exports and services trade recorded a larger surplus compared to the year before, the drag exerted by net exports on GDP reduced. The subdued contribution of exports was more than counterbalanced by the pick-up in fixed investment, thereby continuing the trend of domestic stimulus seamlessly replacing external stimuli.

²⁴ The eight major cities referred to in the Proptiger reports are Ahmedabad, Bengaluru, Chennai, Delhi NCR, Hyderabad, Kolkata, Pune, and Mumbai MMR.

²⁵ <https://www.proptiger.com/guide/news-views>

1.20 FY24 also marked the year GDP reached levels projected by the pre-pandemic trajectory. A trend analysis in Box I.1 details how the overall economy and most supply and demand-side sectors have grown at a pace to erase any permanent losses in output and demand.

Box I.1: Growth in GDP, GVA, and their components ensure no permanent losses in demand and output

A permanent output loss refers to a downward level shift in the observed variable due to the loss in output capacity. This box item visualises the pre-pandemic and post-pandemic trends in India's aggregate macroeconomic variables such as GDP, GVA, private consumption and the subcomponents of GVA.

Chart I.26: A recovery to pre-pandemic trajectory in GDP

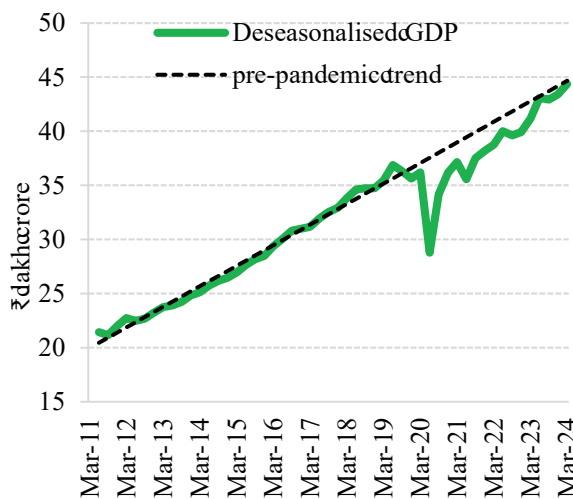


Chart I.27: Gap from trend reducing steadily

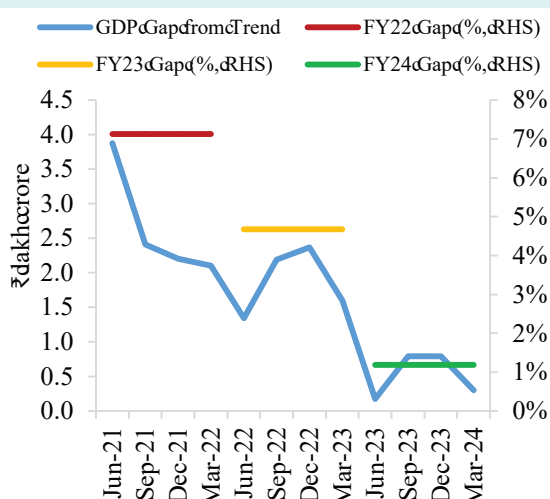


Chart I.28: No permanent losses in output capacity

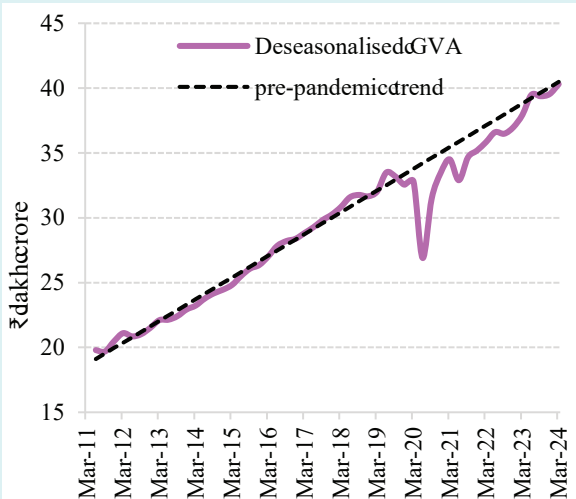


Chart I.29: No permanent consumption losses

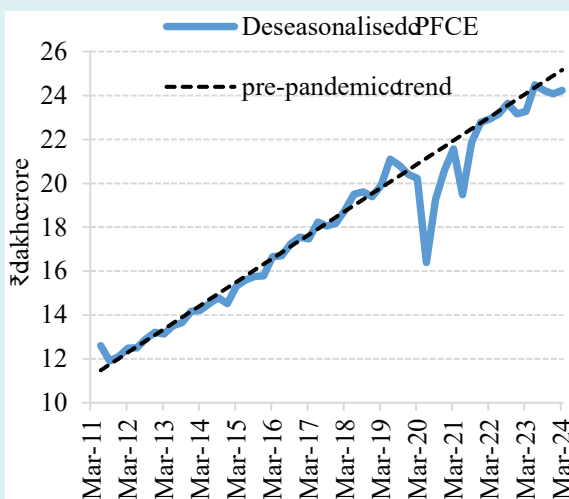
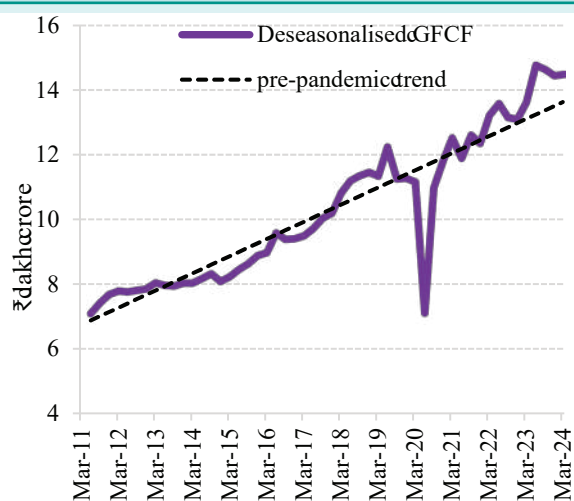
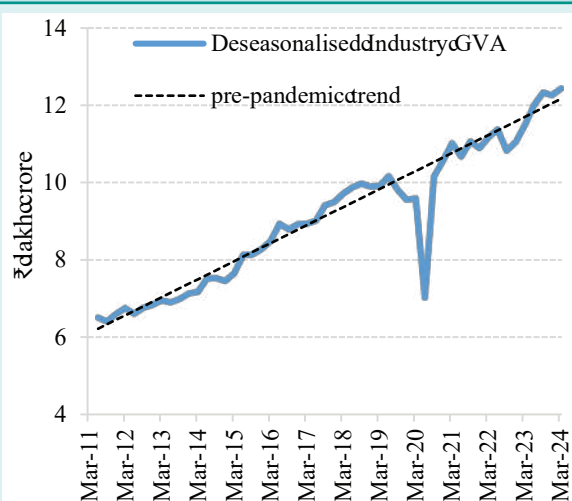
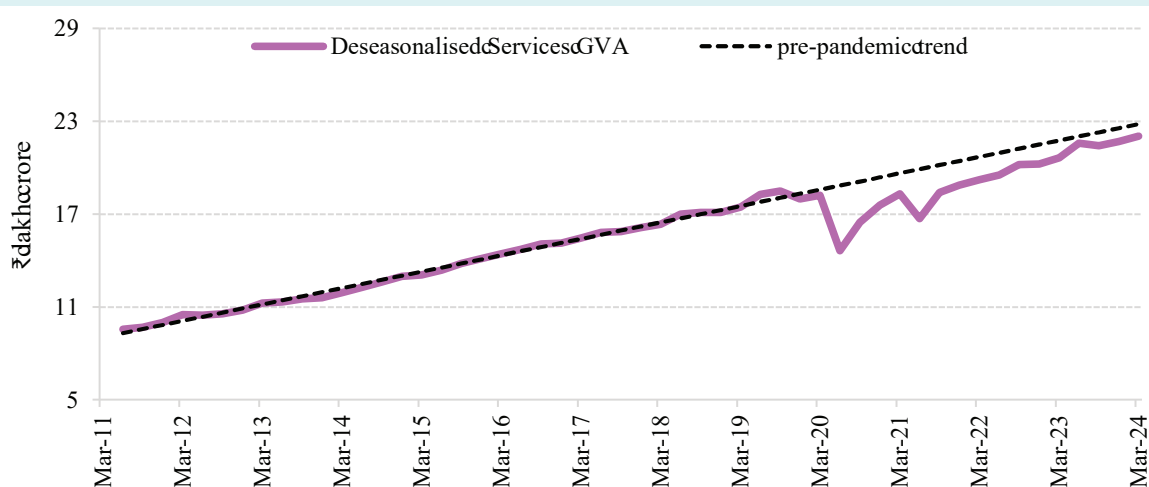


Chart I.30: Investment has taken off**Chart I.31: Industrial GVA growing faster than pre-pandemic trajectory****Chart I.32: Services GVA lagging**

Source: Chart I:25 to Chart I.31 are using calculations based on Statement 13: Annual and Quarterly Estimates of GDP at Constant Prices, 2011-12 Series, National Accounts Data, MoSPI

In the analysis, six key macroeconomic variables at constant (2011-12) prices, i.e., GDP, GVA, PFCE, GFCF, industry GVA, and services GVA of quarterly frequency, have been deseasonalised using the X-12 ARIMA technique that decomposes variables into its trend, seasonal, cyclical, and idiosyncratic components. The deseasonalised variables have been visualised to understand where these variables stand vis-à-vis their pre-pandemic trend projections. A trend line based on de-seasonalised data between June 2011 and March 2020 has been plotted and extended until March 2024. This trend reflects the approximate projection of the variable in each quarter from June 2020 to March 2024 had the pandemic-induced contraction of economic activity not occurred.

The visualisation reveals that GDP, GVA, private consumption, GFCF, and industrial GVA have recovered quickly. We see that the compounded quarterly growth rate (CQGR) of these variables is greater in the period Q3 FY21 – Q4 FY24 than the CQGR in the pre-pandemic period of Q1 FY12 – Q4 FY20 (Table I.). This enabled a broad catch-up to the levels projected by the pre-pandemic trends, thereby averting any permanent losses in demand/output. The reasons for this are manifold. The pandemic-induced contraction presented an opportunity for the deployment of a counter-cyclical fiscal policy that focussed on capital expenditure, thereby positioning government-driven capital formation as a driver of growth. It also enabled the implementation of multiple process reforms and the deployment of public digital infrastructure that boosted the ease of doing business. The pandemic also accelerated the adoption of digital technologies amongst the population and enhanced financial inclusion. With the GST and the Insolvency and Bankruptcy Code (IBC) acting as tailwinds to the economy, growth took off.

Table I.1: Faster growth since the pandemic-induced contraction

Compounded growth in deseasonalised quarterly series (in %)	GDP	GVA	PFCE	Industrial GVA	Services GVA	GFCF
Between Q1FY12 - Q4FY20	1.5	1.5	1.4	1.1	1.9	1.3
Between Q3FY21 - Q4FY24	1.9	1.8	1.7	1.4	2.1	2.0

GVA of the services sector is yet to reach the level projected by the pre-pandemic trend. The granular data available until FY23 reveals that this is on account of the trade, hotel, road and air transport sectors. These sectors, taken together, contributed about 28.5 per cent to total real GVA in FY23 and were only one per cent above their levels in FY20.

Chart I.27 reveals that the gap between GDP and its pre-pandemic trend has been closing, and GDP was only around 1 per cent below this trend on an annual average basis in FY24. There is still some catching up left. The extant momentum in growth not only allows the economy to catch up with its pre-pandemic trend without stoking inflationary pressures but aids in surpassing it.

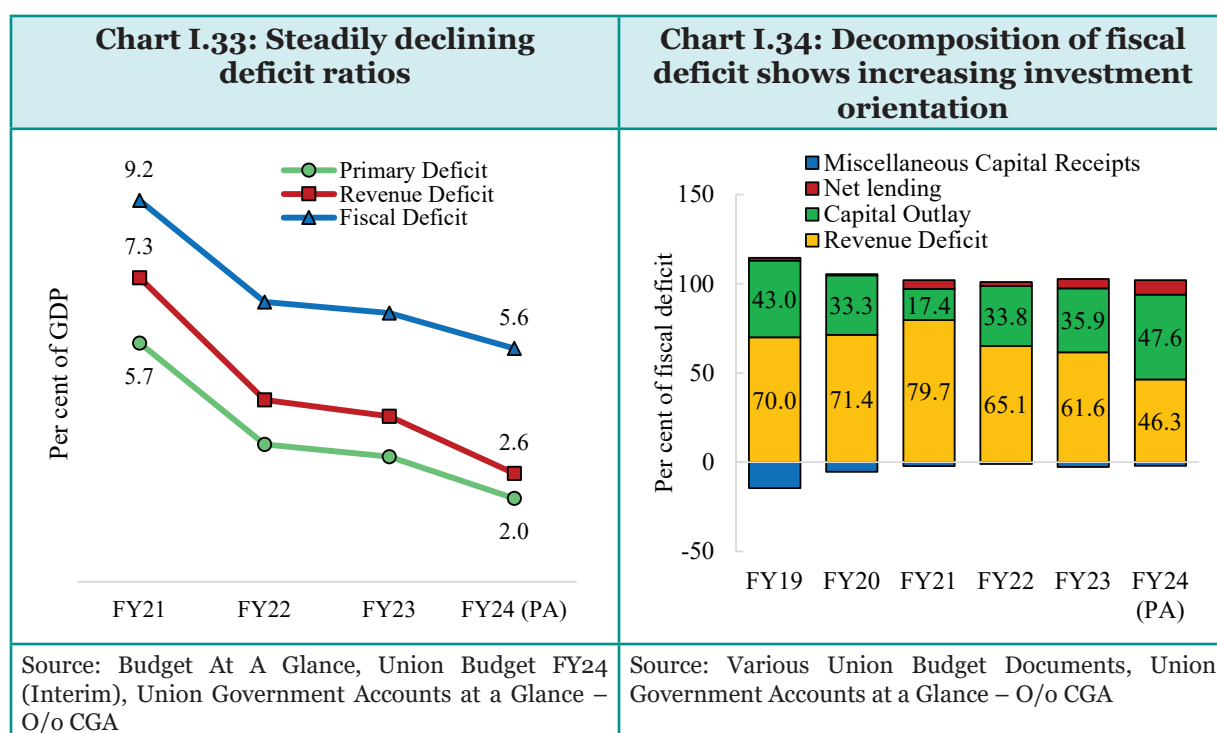
MACROECONOMIC STABILITY SAFEGUARDS GROWTH

1.21 For India, FY23 began with multiple challenges. Spillovers from the conflict in Europe were stoking domestic price pressures and widening the current account deficit (CAD) through increased oil prices. Central banks in several countries began raising policy rates to battle inflationary pressures, leading to significant uncertainty in AEs and EMEs alike. However, throughout FY23 and FY24, the focus on macroeconomic stability was vital in securing economic growth amidst domestic and external vulnerabilities.

Improving Public Finances

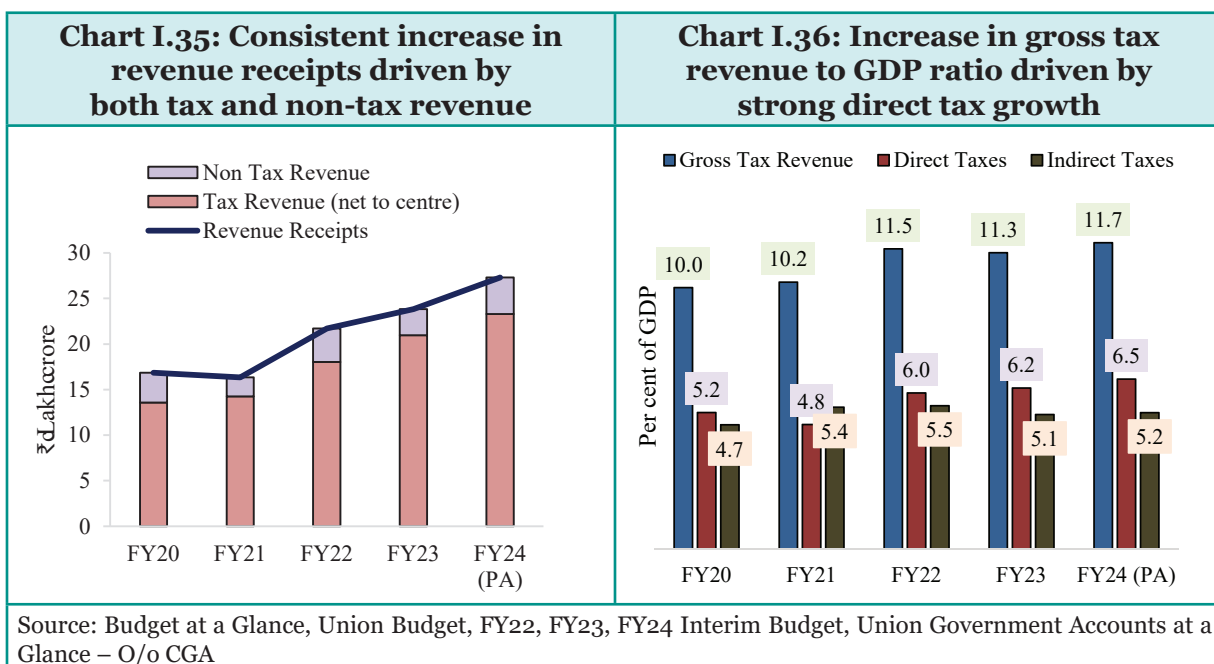
Consolidation of Union Government Finances

1.22 Against the global trend of widening fiscal deficit and increasing debt burden, India has remained on the course of fiscal consolidation. The favourable fiscal performance in 2023, emerged as the cornerstone of India's macroeconomic stability. The fiscal deficit of the Union Government has been brought down from 6.4 per cent of GDP in FY23 to 5.6 per cent of GDP in FY24, according to provisional actuals (PA) data released by the Office of Controller General of Accounts (CGA). Strong growth in direct and indirect taxes on account of resilient economic activity and increased compliance meant that the tax revenues generated exceeded the conservative budgetary estimates. Additionally, higher-than-budgeted non-tax revenue in the form of dividends from the RBI has buffeted revenue receipts. In combination with restrained revenue expenditure, these buoyant revenues ensured lower deficits. A decomposition of the fiscal deficit over the past few years reveals that with a narrowing revenue deficit, a larger share of the fiscal deficit is being accounted for by capital outlay. This suggests that the productivity of borrowed resources has improved.

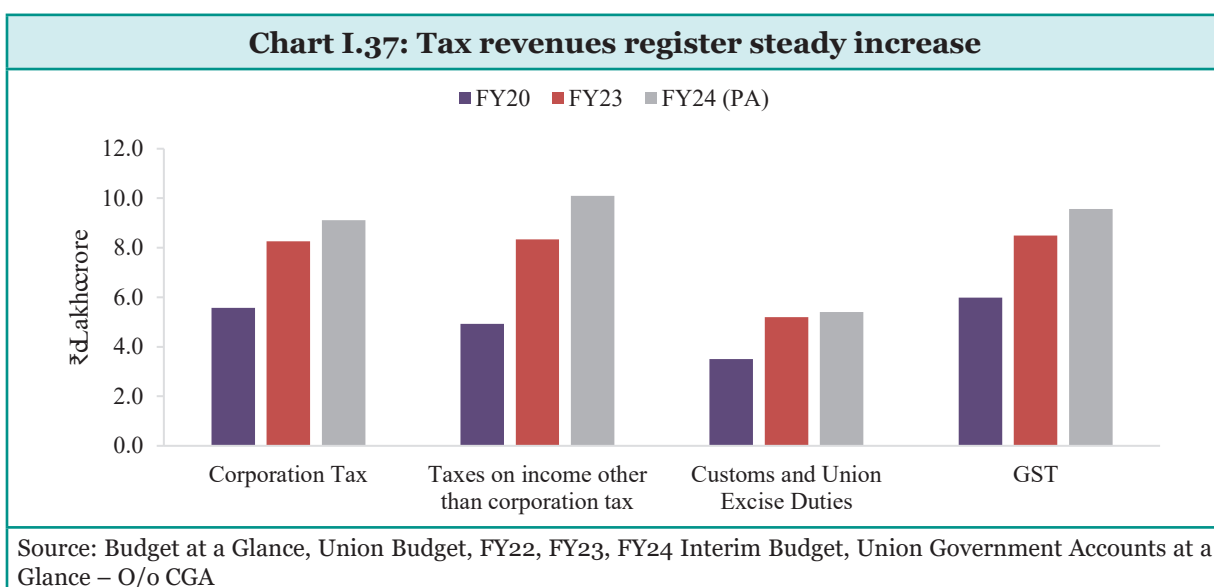


Buoyancy in revenues continues in FY24

1.23 Significant fiscal consolidation post-pandemic could be achieved largely due to buoyant revenues. Revenue receipts of the union government consisting of tax revenue (net to centre) and non-tax revenue (NTR) increased YoY by 14.5 per cent in FY24 (PA), with robust growth in both tax and non-tax revenues.



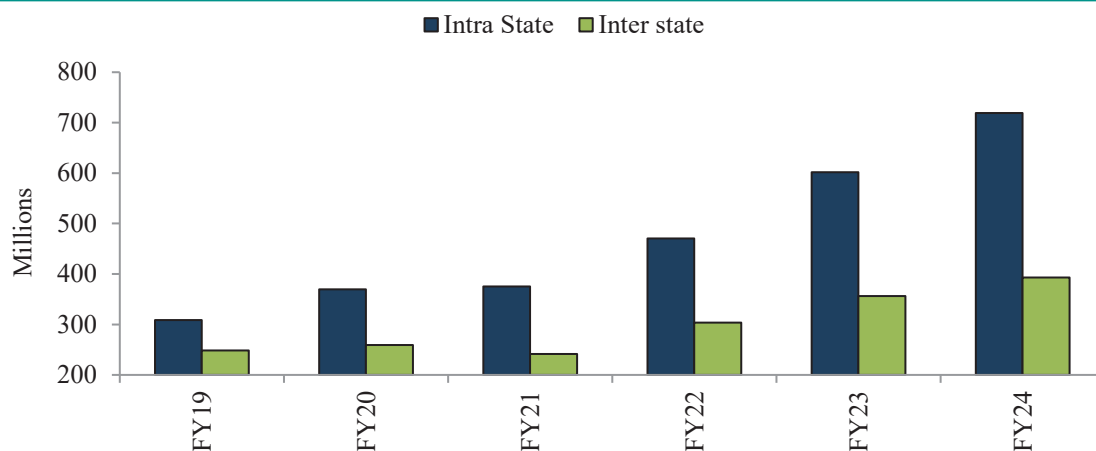
1.24 The growth in gross tax revenue (GTR) was estimated to be 13.4 per cent in FY24, translating into tax revenue buoyancy of 1.4. The growth was led by a 15.8 per cent growth in direct taxes and a 10.6 per cent increase in indirect taxes over FY23. Broadly, 55 per cent of GTR accrued from direct taxes and the remaining 45 per cent from indirect taxes. The increased contribution of direct taxes to GTR over the years has been in line with the government’s effort to enhance progressivity in taxation. The efficiency of tax collection has increased over time, reflected in the cost of collection of direct taxes declining from 0.66 per cent of gross collections in FY20 to 0.51 per cent in FY23²⁶.



²⁶ Income Tax Department, Consolidated Time Series Data, Financial Year 2000-01 to 2022-23, Central Board of Direct Taxes (<https://tinyurl.com/3chx8v83>)

1.25 The increase in indirect taxes in FY24 was mainly driven by a 12.7 per cent growth in GST collection. GST E-way bill generated has also registered an uptick post-pandemic. The increase has been equally pronounced for both intra-state trade and inter-state trade. The increase in GST collection and E-way bill generation reflects increased compliance over time.

Chart I.38: Robust E-way bill generation corroborates strong economic growth momentum



Source: GST Statistics (<https://www.gst.gov.in/download/gststatistics>)

1.26 Over the last seven years, GST has matured significantly through streamlining of procedures and, in the process, enhancing tax buoyancy for the Union and State governments. There have been calls for further rationalisation of rate structure to compress the number of rates, elimination of rate inversions, introduction of broad-band rates for similar products and expanding the tax base. Demands also relate to differentiating between serious and less serious offences, spreading awareness among taxpayers regarding common mistakes, encouraging voluntary compliance and expediting the resolution of disputes.²⁷

1.27 Within non-debt capital receipts, the proceeds from the National Monetisation Pipeline (NMP), which was announced in the Union Budget FY22, are gaining traction. The NMP listed core assets of union government ministries and public sector enterprises with a potential of ₹6 lakh crore for monetisation over the four-year period of FY22 – FY25. During FY22 - FY24, receipts worth ₹3.9 lakh crore have been recorded as against a target of ₹4.3 lakh crore.²⁸ The Ministry of Road Transport and Highways and the Ministry of Coal contributed ₹97 thousand crore out of proceeds worth ₹1.6 lakh crore in FY24. The National Highways Authority of India has identified and published an indicative list of 33 assets to be monetised in FY25. This will help improve capital allocation by investors while aiding the government in its pursuit of fiscal consolidation.

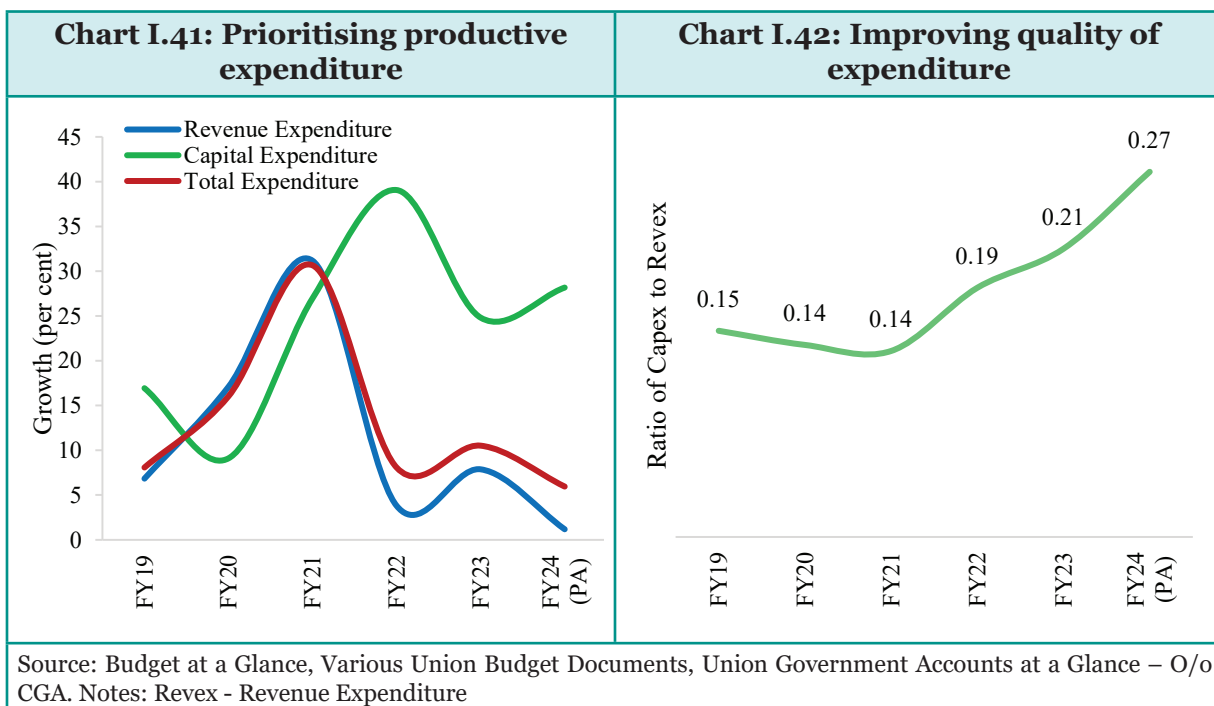
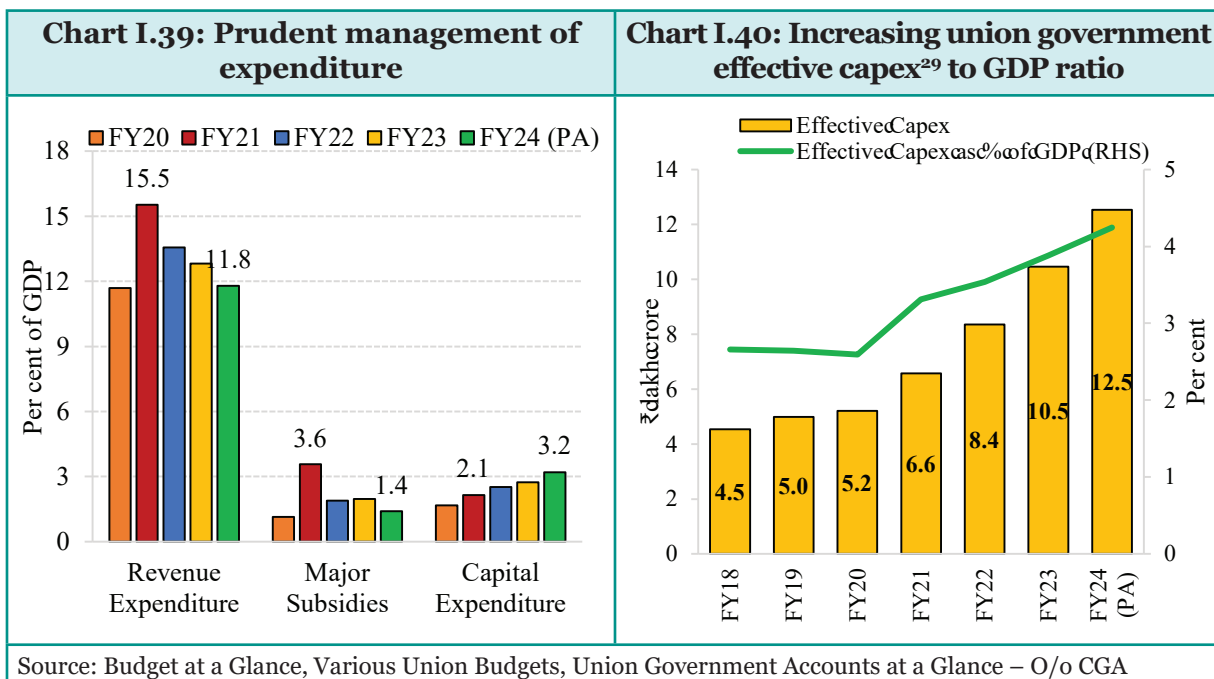
Trends in Central Government Expenditure

1.28 The government has followed a path of fiscal consolidation while continuing to protect the vulnerable sections and investing in the productive capacity of the economy. Successive

²⁷ <https://tinyurl.com/2bam4ht8>

²⁸ <https://tinyurl.com/d3cfceu3>

budgets moderated the growth in revenue expenditure. While achieving the compression in revenue expenditure as a per cent of GDP, the government also ensured that free food grains are provided to 81.4 crore people in the country. At the same time, shares of total expenditure allotted to capital spending were progressively enhanced, thereby improving the quality of expenditure. Government expenditure in FY24 continued this trend whereby, as per the provisional actuals, total expenditure declined to 15.0 per cent of GDP from 17.7 per cent in FY21.



29 Effective Capex includes capex and Grants-in-Aid for creation of capital assets.

Capex has lifted the productive potential of the economy; time for the private sector to take the baton

1.29 The PA show that capital expenditure for FY24 stood at ₹9.5 lakh crore, an increase of 28.2 per cent on a YoY basis, and was 2.8 times the level of FY20. The Government's thrust on capex has been a critical driver of economic growth amidst an uncertain and challenging global environment.

1.30 The focus of capex has been broad-based. Spending in sectors such as road transport and highways, railways, defence services, and telecommunications delivers higher and longer impetuses to growth by addressing logistical bottlenecks and expanding productive capacities. Government capex has also begun to crowd in private investment, as discussed earlier in this chapter. Additionally, the Government continues to disburse grants-in-aid for the creation of capital assets to the states, thereby incentivising them to increase their productive spending.

1.31 At this juncture, it is important to note that while it remains the government's responsibility to facilitate the development of infrastructure and address logistical challenges, it is incumbent upon the private sector to take forward the momentum in capital formation on its own and in partnership with the Government. Between FY19 and FY23, the share of private non-financial corporations in overall GFCF increased only by 0.8 percentage points from 34.1 per cent to 34.9 per cent. This was mostly driven by their fast-increasing share in the additional stock of dwellings, other buildings and structures. Their share in addition to the capital stock in terms of machinery and equipment, started growing robustly only since FY22, a trend that needs to be sustained on the strength of their improving bottom-line and balance sheets in order to generate high-quality jobs.

**Table I.2: Broad-based deployment of Union Government capex
(Values in ₹ thousand crore)**

Sector	FY23	FY24 (PA)	Growth
Road Transport and Highways	206.0	263.9	28.1%
Railways	159.3	242.6	52.3%
Defence Services (capital outlay)	142.9	154.3	7.9%
Transfer to States	92.7	122.9	32.5%
Telecommunications	54.7	59.4	8.5%
Housing and Urban Affairs	26.9	26.4	-1.6%
Atomic Energy	13.8	14.5	5.1%
Defence (Civil)	8.0	10.3	29.5%
Police	8.2	9.7	18.7%
Space	4.3	4.4	3.4%

Source: Statement 3 of Expenditure Profile, Union Budget 2024-25 (Interim), Union Government Accounts at a Glance – O/o CGA

Revenue expenditure growth remains restrained

1.32 The PA show that total expenditure for FY24 is lower by ₹60.6 thousand crore as compared to the budgeted estimates. However, these lower-than-budgeted estimates have not resulted in compromises on important areas of revenue spending, such as rural development and education, where allocation is significantly higher than budgeted estimates. Efficient expenditure management, aided by lower borrowing costs, has led to a marginal downward revision of budgeted expenditure on interest payments in FY24.

1.33 However, even though expenditure on interest payments is lower than budgeted, it constitutes 30.4 per cent of the revenue expenditure in FY24 (PA). A commitment to fiscal consolidation in the medium term, combined with revenues from asset monetisation and privatisation, will be essential in reducing the share of interest payments in revenue expenditure in order to generate more fiscal headroom.

1.34 Expenditure on major subsidies declined by 22.1 per cent on a YoY basis, led by a decrease in fertiliser³⁰ and food subsidies by 24.6 per cent and 22.4 per cent, respectively, in FY24. The prices of fertilisers had steeply increased in FY23 due to the Russia-Ukraine conflict, prompting a higher outlay for its subsidy. However, in FY24, the supply chains adapted, and as a result, the prices of fertilisers have broadly returned to pre-conflict levels. This facilitated a lower outlay on fertiliser subsidies. The additional food subsidy, instituted to protect vulnerable sections of the population, has been gradually consolidating as well.

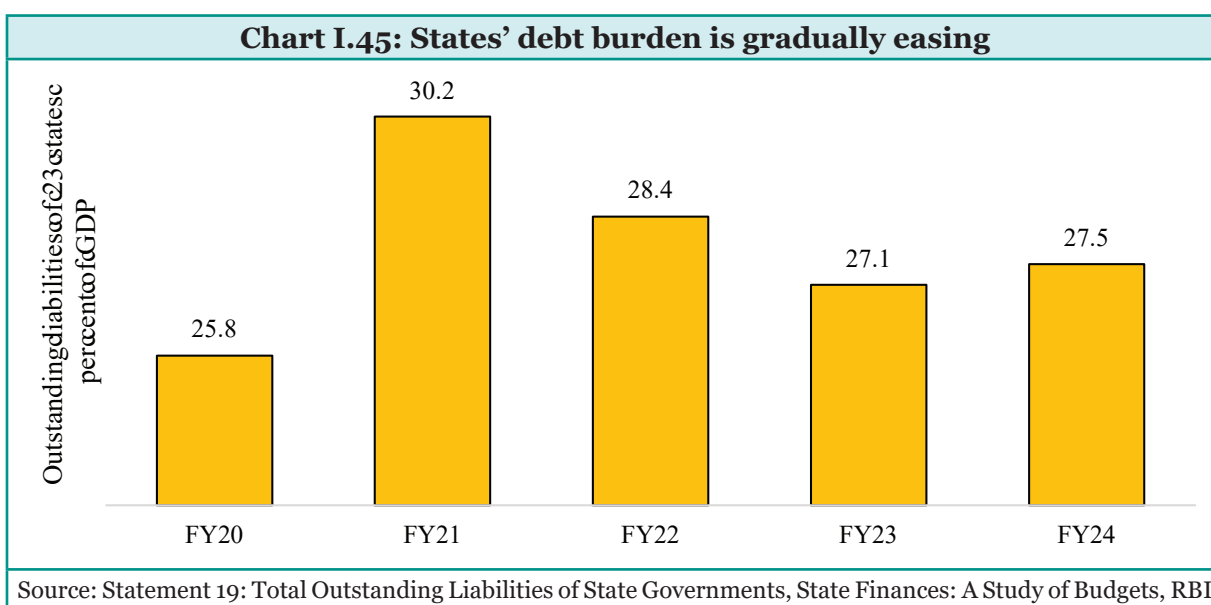
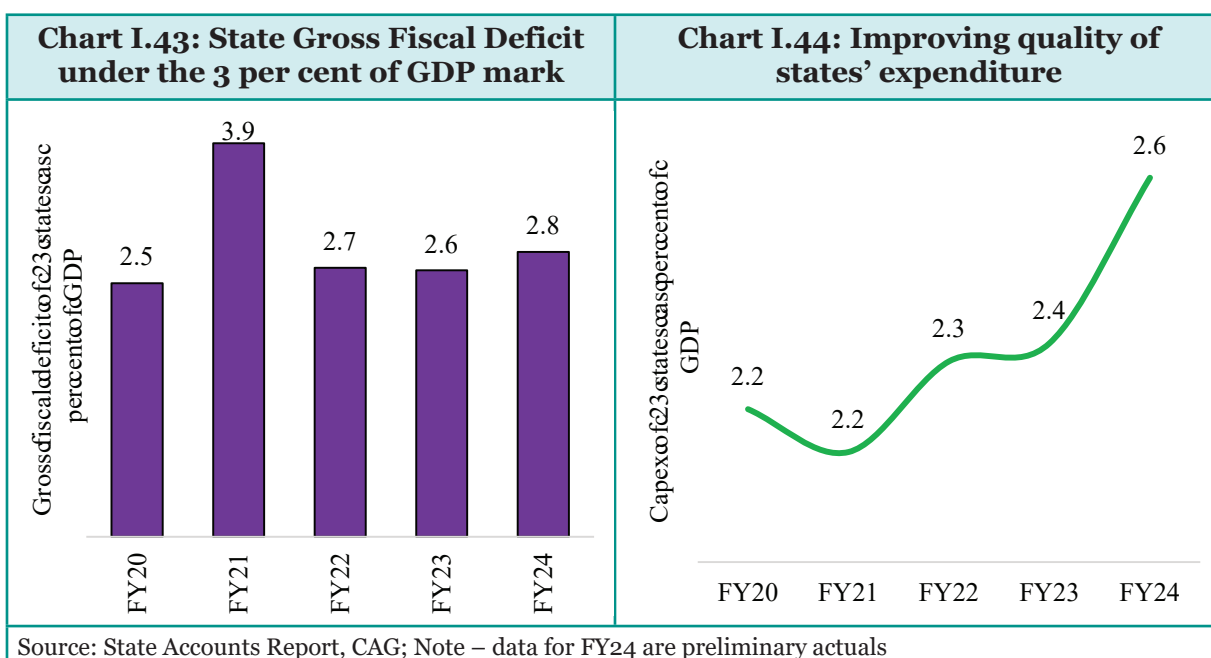
Overview of State Government Finances

1.35 State governments continued to improve their finances in FY24. Preliminary unaudited estimates of finances for a set of 23 states³¹, published by the Comptroller and Auditor General of India, suggest that the gross fiscal deficit of these 23 states was 8.6 per cent lower than the budgeted figure of ₹9.1 lakh crore.³² This implies that fiscal deficit as a per cent of GDP for these states came in at 2.8 per cent as against a budgeted 3.1 per cent. The quality of spending by state governments improved, too, with state governments focusing on capex as well.

30 Fertiliser subsidy includes nutrient-based fertiliser subsidy and urea subsidy

31 The 23 major states are: Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Punjab, Rajasthan, Tamil Nadu, Telangana, Tripura, Uttar Pradesh, Uttarakhand, and West Bengal.

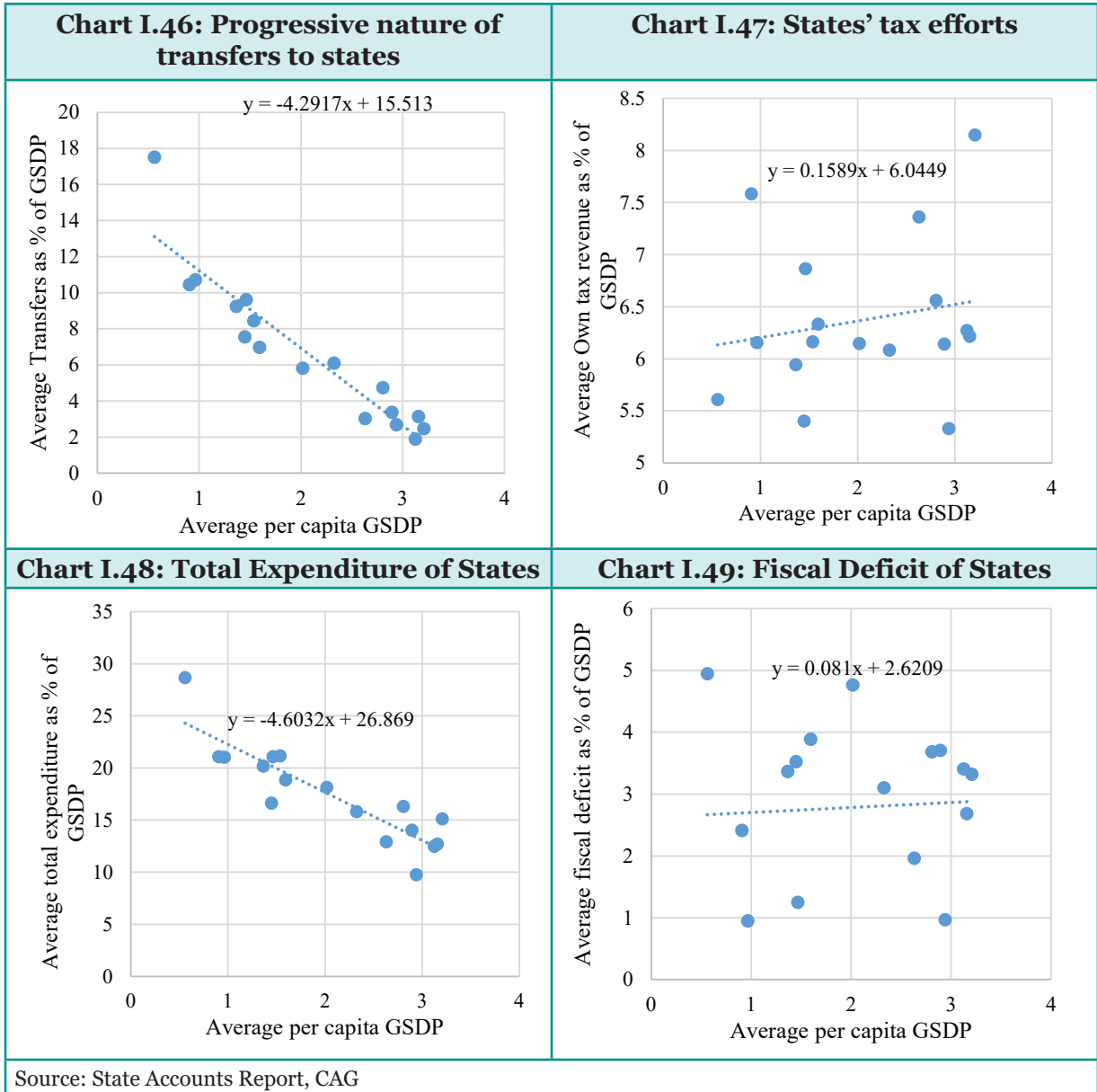
32 Budgeted figures available from e-STATES Database published by RBI in their report on State Finances – A Study of State Budgets, December 2023 (<https://tinyurl.com/ywv3wvdr>)



1.36 Charts I.46 through I.49 encapsulate states' finances³³. The Union Government's transfers to the states are highly progressive, with states with lower Gross State Domestic Product (GSDP) per capita receiving higher transfers relative to their GSDP. On the revenue side, however, the richer states, with certain exceptions, are able to mobilise a greater proportion of their GSDP as taxes. The combined result of these dynamics on the receipts side is that poorer states are enabled to incur greater public spending relative to their GSDP with the system of fiscal

33 Charts I.46 to I.49 are based on the averages of the respective variables for FY22 and FY23. The graphs have been plotted for a total of 17 states, i.e., Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh, and West Bengal. GSDP and PC GSDP of Maharashtra for FY23 have been taken from the Economic Survey of Maharashtra 2024

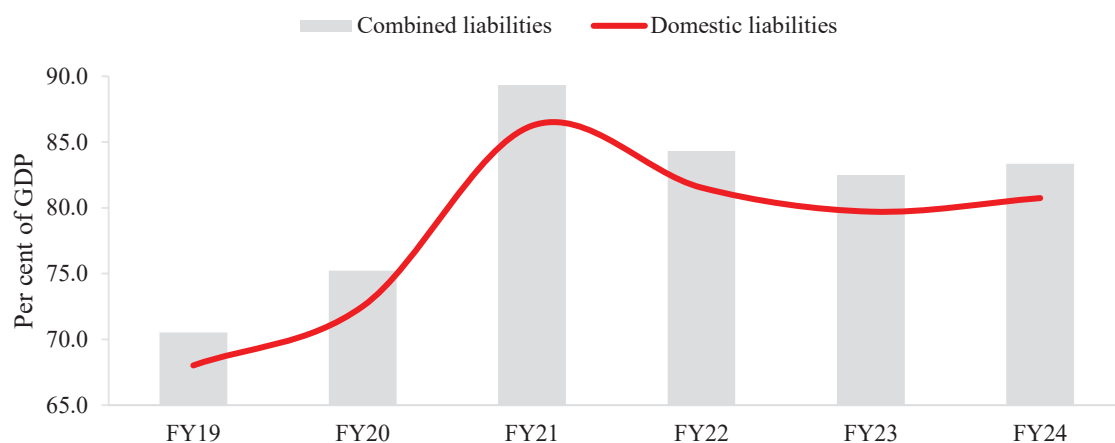
devolution that India has. Given the importance of public expenditure in stimulating growth and development, this is sine qua non for addressing regional imbalances in the country.



General Government Debt

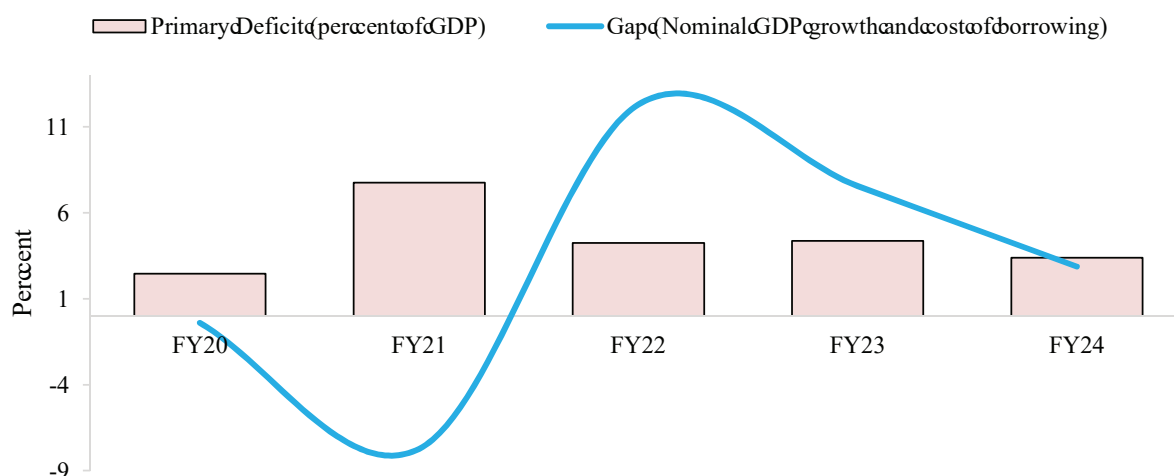
1.37 In the years since the pandemic, the Union Government and the State Governments in general have focussed on fiscal consolidation, which was reflected in the declining debt trajectory of the government till FY23. The general government debt to GDP ratio increased slightly in FY24 despite a declining primary deficit because monetary tightening led to a spike in interest rates, while the decline in inflationary pressures resulted in a lower-than-budgeted nominal GDP growth. However, with the increased prospects of monetary policy easing, along with an uptick in WPI inflation and the government's continued commitment to fiscal consolidation, the debt ratio is likely to resume its declining trend.

Chart I.50: General Government liabilities to GDP ratio come off their peak in FY21



Source: Table 112, Combined Liabilities of Central and State Governments, Handbook of Statistics on Indian Economy, RBI. Notes³⁴

Chart I.51: Primary deficit declines, and, growth-interest rate differential remains positive



Source: Primary Deficit - Database on Indian Economy, RBI; Nominal GDP growth - Provisional Estimates for FY24, National Accounts Statistics, MoSPI; Cost of borrowing³⁵ - RBI Database on Indian Economy, Budget at a Glance.

1.38 Union Government debt is characterised by low currency and interest rate risks. This is owing to the low share of external debt in the debt portfolio and almost all external borrowings being from official sources. The gradual elongation of the maturity profile of the Union Government's debt is leading to reduced rollover risks. The proportion of dated securities

³⁴ Data for combined liabilities for FY23 are Revised Estimates, and data for FY24 are Budget Estimates. Data for GDP is RE for FY21, FY22, FY23 and PE for FY24.

³⁵ The cost of borrowing is calculated as the total interest payments as a per cent of the average debt of period (t) and (t-1).

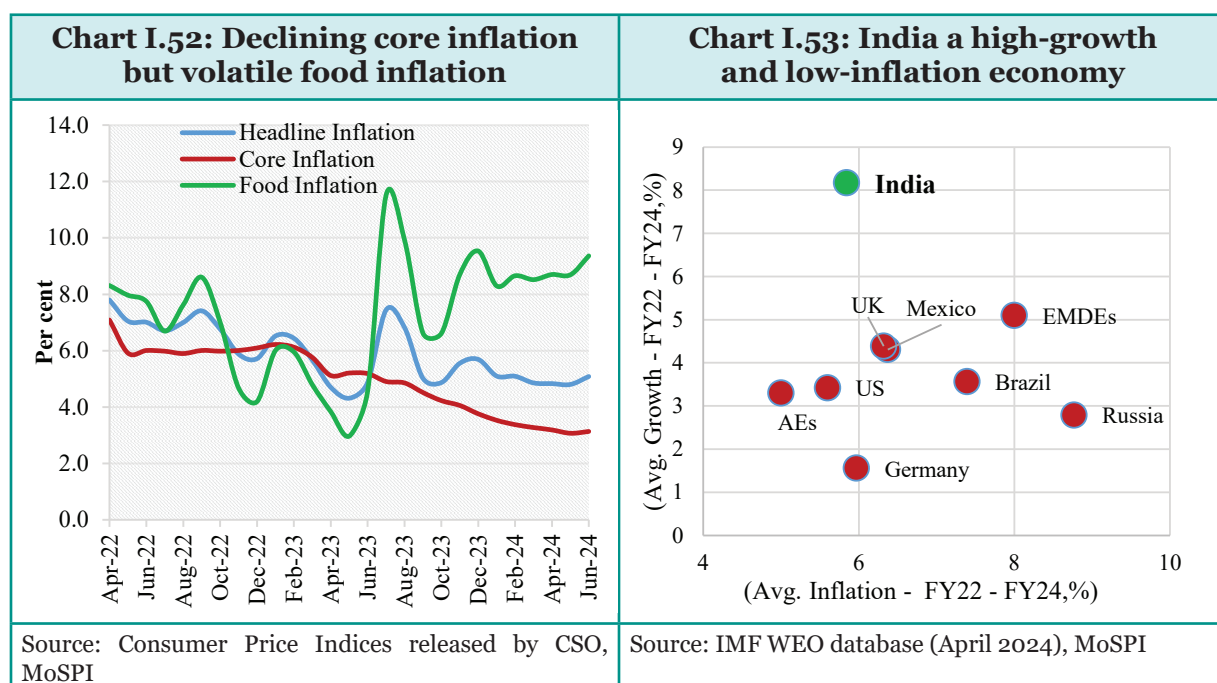
maturing in less than five years has seen a consistent decline in recent years. The weighted average maturity of the outstanding stock of dated securities of the Government has increased from 9.6 years in end-March 2011 to 12.5 years in end-March 2024.³⁶

1.39 The sustained improvement in fiscal metrics is beginning to have an impact on India's credit ratings. For the first time in 13 years, S&P Global Ratings upgraded India's sovereign credit rating outlook from 'stable' to 'positive' in May 2024 on the back of robust economic growth, sound economic fundamentals and improved composition of government spending. S&P mentioned that cautious monetary and fiscal policy that diminishes general government debt and interest burden while improving economic resilience could lead to a higher rating over the next two years. The agency further indicated that such an update would require continued commitment to fiscal consolidation in a manner that reduces general government deficits to below 7 per cent on a structural basis. If that were to happen, India's 10-year benchmark bond yield will drop between 30 and 50 basis points. The drop in the benchmark borrowing cost will cause interest rates to decline in general, leading to overall lower cost of borrowing for households and businesses. That would be a fiscal stimulus in itself.

Moderation in inflation pressure

1.40 Despite global supply chain disruptions and adverse weather conditions, domestic inflationary pressures moderated in FY24. After averaging 6.7 per cent in FY23, retail inflation declined to 5.4 per cent in FY24. This has been due to the combination of measures undertaken by the Government and the RBI. The Union Government undertook prompt measures such as open market sales, retailing in specified outlets, timely imports, reduced the prices of Liquefied Petroleum Gas (LPG) cylinders and implemented a cut in petrol and diesel prices. The RBI raised policy rates by a cumulative 250 bps between May 2022 and February 2023. It also managed liquidity levels efficiently and maintained consistent and coherent communication with market participants. Even as higher policy rates are transmitted through the system, the RBI continues to support growth with adequate liquidity, thereby ensuring that inflation is headed to the target of 4 per cent on a durable basis. The effects of these measures are reflected in the latest data on CPI inflation – headline CPI inflation of 5.1 per cent in June 2024, and core inflation declined to 3.1 per cent. Consequently, India was the only country amongst its peers to traverse a high-growth and low-inflation path in the period FY22 – FY24 (Chart I.53). This is despite the fact that there were pressures on the food inflation front, driven by adverse weather conditions.

³⁶ Table 4.2 of PDMC quarterly report (January – March 2024) (<https://tinyurl.com/mrxaf4kw>)



The financial system remains resilient

1.41 The RBI's vigil over the banking and financial system and its prompt regulatory actions ensure that the system can withstand any macroeconomic or systemic shock. Data from the RBI's Financial Stability Report of June 2024 show that the asset quality of SCBs has improved, with the Gross Non-Performing Assets (GNPA) ratio declining to 2.8 per cent in March 2024, a 12-year low. The system-wide capital to risk-weighted assets ratio (CRAR) declined marginally by 37 basis points (bps) over FY24 due to an RBI-mandated revision of risk weights but remained well above the regulatory threshold. The profitability of SCBs remained steady, with the return on equity and return on assets ratios at 13.8 per cent and 1.3 per cent, respectively, as of March 2024. Macro stress tests also reveal that SCBs would be able to comply with minimum capital requirements even under severe stress scenarios.

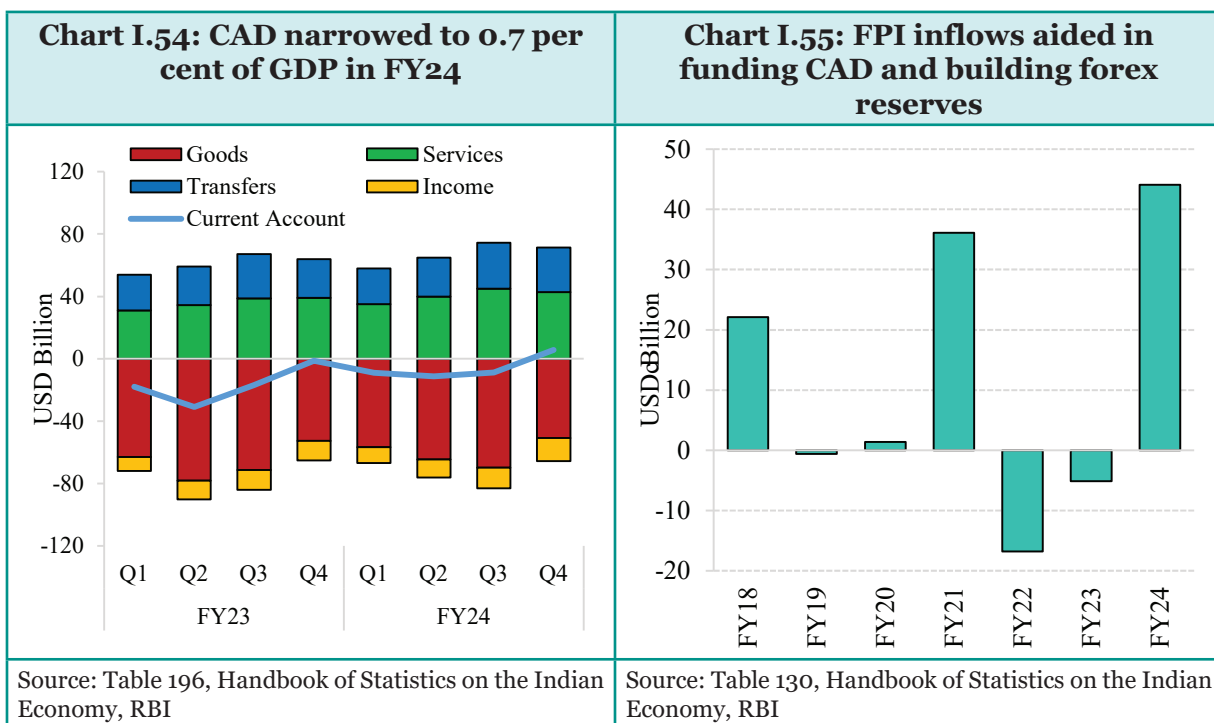
1.42 The RBI remains proactive in undertaking regulatory action. In a measure to regulate the exuberant growth in the unsecured lending category and preserve financial stability, the RBI tightened norms around this portfolio. Growth in unsecured loans was outpacing that in overall credit. To tackle this problem, the RBI directed that consumer credit exposure for banks and Non-Banking Financial Companies (NBFCs) will attract a risk weight of 125 per cent compared to 100 per cent earlier. The risk weight for credit card loans by banks and NBFCs was fixed at 150 per cent and 125 per cent, respectively, up from 125 per cent and 100 per cent earlier. Prompt regulatory actions shield the banking and financial system from adverse developments and instil confidence in market participants. The soundness of the banking system will facilitate the financing of productive opportunities and lengthen the financial cycle, both of which are necessary to sustain economic growth.

India's external sector is safely navigating through uncertainties

1.43 On the external front, moderation in merchandise exports continued during FY24, mainly

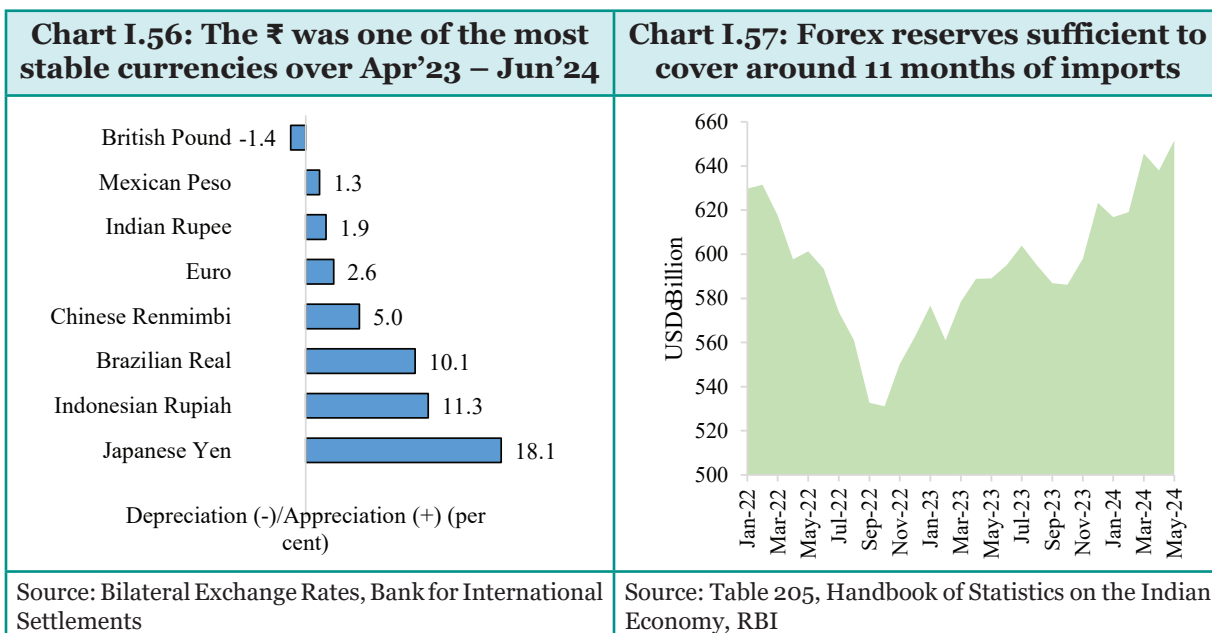
on account of weaker global demand and persistent geopolitical tensions. However, a sharper decline in India’s merchandise import growth, owing to declining commodity prices, resulted in a lower trade deficit in FY24. However, India's service exports have remained robust, reaching a new high of USD 341.1 billion in FY24. Exports (merchandise and services) in FY24 grew by 0.15 per cent, while the total imports declined by 4.9 per cent despite a strong domestic market demand.³⁷ Net private transfers, mostly comprising remittances from abroad, grew to USD 106.6 billion in FY24. As a result, the CAD stood at 0.7 per cent of the GDP during the year, an improvement from the deficit of 2.0 per cent of GDP in FY23.

1.44 Supported by optimism surrounding India’s growth story, progressive policy reform, economic stability, fiscal prudence and attractive investment avenues, India witnessed robust FPI inflows in FY24 that helped fund the CAD and aided the RBI in building adequate forex reserves. Net FPI inflows stood at USD 44.1 billion during FY24 against net outflows in the preceding two years. Net FDI inflows, however, witnessed moderation largely as a part of the global phenomenon of declining FDI flows on account of increased scepticism. Net FDI inflows to India declined from USD 42.0 billion during FY23 to USD 26.5 billion in FY24. However, gross FDI inflows moderated by only 0.6 per cent in FY24. The contraction in net inflows was primarily due to a surge in repatriation/disinvestment.



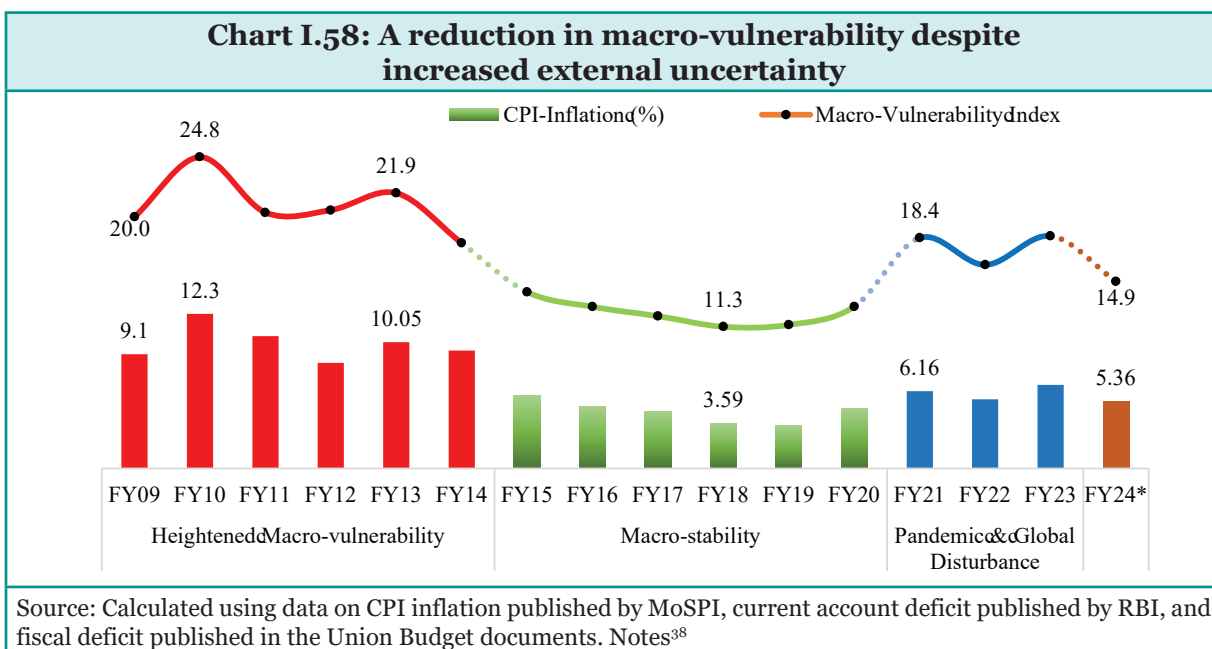
1.45 Overall, India’s external sector is being deftly managed with comfortable foreign exchange reserves and a stable exchange rate. Forex reserves as of the end of March 2024 were sufficient to cover 11 months of projected imports and more than 100 per cent of total external debt. The Indian Rupee has also been one of the least volatile currencies among its emerging market peers in FY24. India’s external debt vulnerability indicators also continued to be benign. External debt as a ratio to GDP stood at a low level of 18.7 per cent as of end-March 2024. The ratio of foreign exchange reserves to total debt stood at 97.4 per cent as of March 2024.

³⁷ Table 132, Handbook of Statistics on the Indian Economy, RBI - <https://tinyurl.com/yne8sbw7>



Reduction in macro vulnerability

1.46 In its pursuit of fiscal consolidation through efficient and prudent fiscal management, the Government continues to stick to the fiscal glide path. The fiscal deficit of the Government is expected to drop to 4.5 per cent of GDP or lower by FY26. This commitment has helped keep the sovereign debt sustainable, thereby keeping sovereign bond yields and spreads in check. All these factors have combined to keep the macroeconomic environment stable and provide a platform for sustainable growth. This is reflected in the downward trajectory of the macroeconomic vulnerability index – an index constructed by combining India's fiscal deficit, CAD and inflation.



³⁸ Retail Inflation from FY09 to FY12 is based on CPI-Industrial Workers released by the Labour Bureau, FY13 to FY24 is based on CPI-Combined released by MoSPI; Gross fiscal deficit data for FY24 for the Union Government is Provisional Actuals, and for the state governments, it is a Budget Estimate.

Box I.2: Strengthening the Statistical System

A sound and dynamic statistical system is the cornerstone for an informed citizenry, data-driven policies and decision-making. Official statistics play a pivotal role in addressing societal challenges and promoting inclusive growth. The government is taking many steps aimed at strengthening administrative and survey statistics, building capacities and improving data quality and timeliness.

MoSPI, the cornerstone

MoSPI is the nodal ministry for the planned and integrated development of the Indian statistical system. MoSPI anchors the core statistics by publishing GDP, price and volume indices and countrywide surveys of macroeconomic and sectoral importance. The Ministry has initiated various new surveys, namely, the annual survey of unincorporated sector enterprises, a time-use survey and started a pilot for an annual survey of service sector enterprises. MoSPI is also working towards increasing the frequency of PLFS data and extending the generation of quarterly estimates for rural areas. Modern IT tools are being adopted for improved data capturing and processing. To encourage greater use of administrative data, a National Metadata Structure is also being developed. The Unified Data Portal project has been envisaged by MoSPI with the objective of creating a centralised database and storage system. Ministries are also taking initiatives to enhance the frequency of various surveys to make more informed policy decisions. Given India's 2047 goals, it is important for development policy that (a) MoSPI is capacitated fully to produce and integrate all required statistics with the desired quality, regularity and timeliness and (b) the quality and timeliness of administrative and transactional data of the line Ministries are brought to levels that fully facilitate timely course corrections.

Further steps to strengthen the statistical database

- a) An extensive exercise for base revision of important economic statistics is being taken up at MoSPI. The exercise to change the base year of CPI from 2012 to 2024 has been initiated. An Advisory Committee on National Accounts Statistics has been set up to decide on the base year for GDP. It is important that the base year of critical data series like the GDP, different price indices and volume indices like Index of Industrial Production (IIP) are updated to the most recent feasible year at the earliest. The ongoing efforts to construct the producer price index for goods and services may be expedited to have a greater grasp of episodes of cost-push inflation. State-level variants of indices like IIP will help understand the emerging geographical patterns. Survey data to help understand private sector capital formation at regular intervals will also help policy formulation.
- b) The high-frequency price monitoring data for essential food items collected by different departments may be linked in such a way that the build-up of prices at each stage from the farm gate to the final consumer is quantifiable and monitorable. This will help improve the effectiveness of administrative action by the Government to stabilise prices of essential food items.

- c) More than 1.3 crore entities are registered under GST and file returns. The granular GST data, if made available, has great potential to analyse the health of businesses, screening of loan applications, provide support for cash flow-based lending, and understand the economies of different geographies deeply.
- d) The XV Finance Commission observes, “The CAG, which is mandated to carry out the role of accounts compilation and finalisation for almost all the States, as well as being the auditor of both the Union and the States, is already in the process of establishing common fiscal data standards. This would eventually ensure the availability of standardised data through a public web portal for granular level fiscal statistics of the Union and the States, both for historic audited fiscal data and high-frequency fiscal data for the current year in downloadable database formats.”³⁹ Granular time series, in database formats, of audited accounts of the Union and the States will make fiscal analysis and policy much easier.
- e) Regular indicators of the dynamics of production and employment in MSMEs are essential, considering their potential for growth and job creation.
- f) Information may be published on industry-wise gross disbursement of bank credit (as opposed to the data on outstanding credit currently available), industry-wise monthly gross financial flows through domestic and external equity and debt routes, and other financing sources.
- g) There is also a need to have a regular mechanism to aggregate the financial flows to infrastructure and physical progress- sectorally and geographically differentiated- achieved in different infrastructure sectors, at least on an annual basis.
- h) The large volume of data generated by schemes such as Pradhan Mantri Jan Arogya Yojana and Ayushman Bharat Digital Mission, which capture details such as hospital admissions, patients’ medical history or demographic details. These can be used for disease surveillance, preventive medication, etc.
- i) The Labour Bureau is also tasked with conducting five surveys relating to workers and employment. Ensuring rigour, timeliness and user-friendliness of data and making it available in database formats will help analysis and policy⁴⁰.

The thrust on evidence also necessitates that the process and impact evaluation capacities in the Union and State Governments and universities are nurtured and driven towards maturity in a time-bound manner.

INCLUSIVE GROWTH

Shift in the approach to welfare

1.47 India’s social welfare approach has undergone a shift from an input-based approach to outcome-based empowerment. Saturation of basic necessities has been recognised as imperative to achieve this, thus impelling an array of flagship initiatives. Government initiatives like providing free-of-cost gas connections under PM Ujjwala Yojana, building toilets under

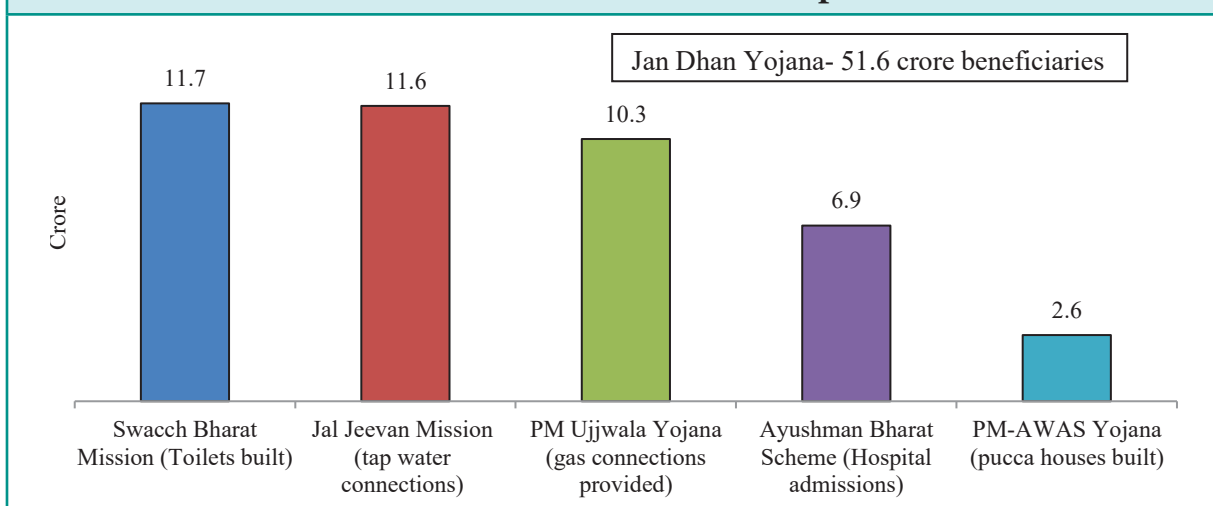
³⁹ <https://tinyurl.com/2dbutsvt>

⁴⁰ <https://tinyurl.com/5xrrja3c>

the Swacch Bharat Mission, opening bank accounts under Jan Dhan Yojana, building pucca houses under PM-AWAS Yojana have improved capabilities and enhanced opportunities for the underprivileged sections.

1.48 The approach also involves the targeted implementation of reforms for last-mile service delivery to truly realise the maxim of “no person left behind”. These include the Aspirational Districts Programme, launched in 2018, for focusing efforts on the most backward regions, the success of which inspired the Aspirational Blocks Programme launched in 2023; the Vibrant Villages Programme for border areas; and more recently, the Viksit Bharat Sankalp Yatra, which saw the participation of 15 crore people in two months starting 15 November 2023⁴¹. The digitisation of healthcare, education and governance helps improve the gains for every rupee spent. The Direct Benefit Transfer (DBT) scheme and Jan Dhan Yojana-Aadhaar-Mobile trinity have been boosters of fiscal efficiency and minimisation of leakages, with ₹36.9 lakh crore having been transferred via DBT since its inception in 2013 (DBT Portal.⁴²).

Chart I.59: Beneficiaries under various government welfare schemes since their inception

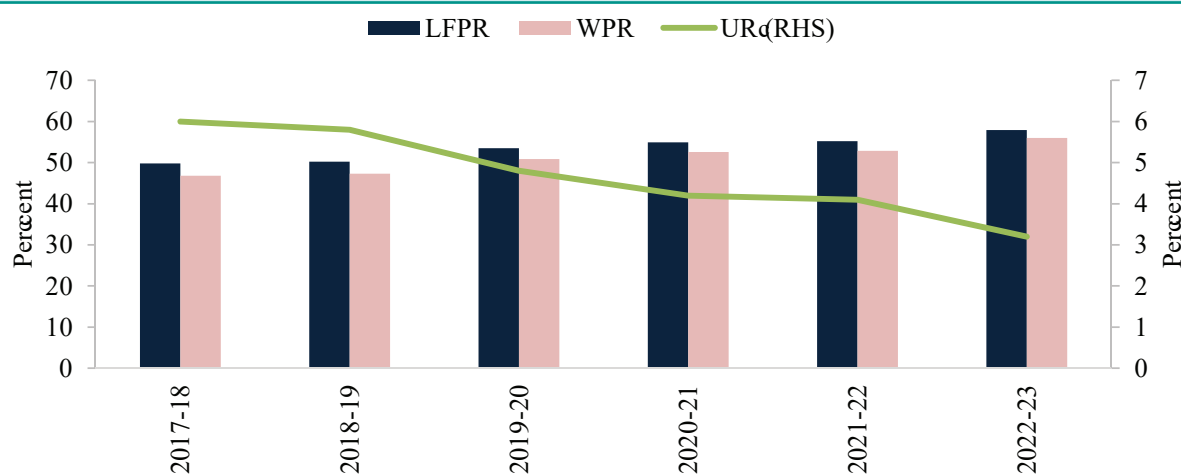


Source: Various PIB Press Releases

1.49 On the employment front, according to the annual PLFS, the all-India annual unemployment rate (persons aged 15 years and above, as per usual status) has been declining since the pandemic. This has been accompanied by a rise in the labour force participation rate and worker-to-population ratio. Even by the relatively strict standards of current weekly status, employment has recovered from the pandemic in urban and rural areas. From the gender perspective, the female labour force participation rate has been rising for six years, i.e., from 23.3 per cent in 2017-18 to 37 per cent in 2022-23, driven mainly by the rising participation of rural women.

⁴¹ 15 Crore Participants in Two Months Viksit Bharat Sankalp Yatra draws huge crowds across many states, 17 Jan 2024 (<https://tinyurl.com/55xae4b3>)

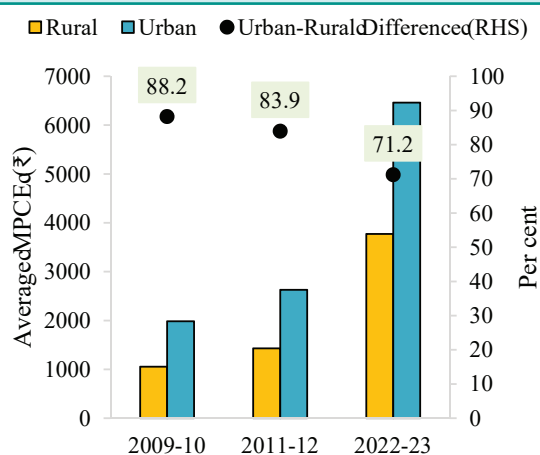
⁴² <https://dbtbharat.gov.in/>

Chart I.60: Declining unemployment rate and improvement in labour force participation rate and worker population ratio

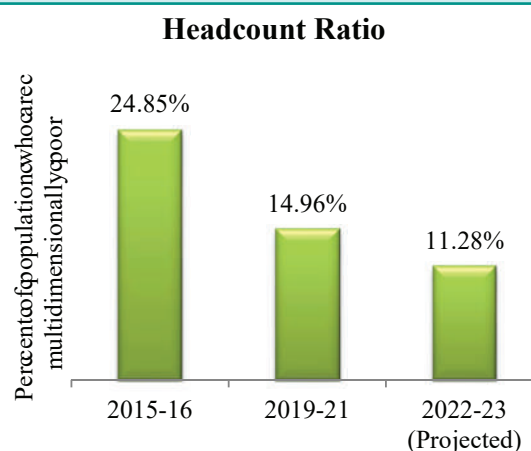
Source: Annual Report, PLFS, July 2022 - June 2023, MoSPI

1.50 As a result of the systematic focus on addressing individual deprivations, the incidence of poverty has reduced remarkably. This is reflected in the steep decline in the headcount ratio of multidimensionally poor between 2015-16 and 2022-23, as per NITI Aayog's discussion paper on multidimensional poverty in India⁴³.

1.51 The initiatives in the social sector have also translated into rising consumption spending, as evident from the results of the latest Household Consumption Expenditure Survey (HCES) 2022-23. The HCES throws many reassuring findings on inclusive growth in the past decade. The monthly per capita consumption expenditure (MPCE) in 2022-23 increased in real terms in both rural and urban areas over 2011-12. The difference between rural and urban MPCE also declined in percentage terms.

Chart I.61: Reduced rural-urban inequality

Source: Survey on Household Consumption Expenditure: 2022-23, MoSPI; Note⁴⁴

Chart I.62: Population that is multidimensionally poor has declined

Source: Multidimensional Poverty in India since 2005-06- A Discussion Paper, Niti Aayog

43 NITI Aayog's discussion paper, 'Multidimensional Poverty in India since 2005-06', 2023 (<https://tinyurl.com/4yvmrcax>)

44 Urban-rural difference is calculated as the difference a percentage of rural MPCE.

OUTLOOK

1.52 The Indian economy recovered swiftly from the pandemic, with its real GDP in FY24 being 20 per cent higher than the pre-COVID, FY20 levels. This meant a CAGR of 4.6 per cent from FY20, despite a 5.8 per cent decline in FY21 inflicted by the pandemic. Analysis in this chapter shows that the current GDP level is close to the pre-pandemic trajectory in Q4FY24. During the decade ending FY20, India grew at an average annual rate of 6.6 per cent, more or less reflecting the long-run growth prospects of the economy. This is the background against which we can see the prospects for FY25.

1.53 IMF projects the global economy to grow at 3.2 per cent in 2024, with risks being broadly balanced. The average annual global growth was 3.7 per cent during the decade ending FY20. Inflationary pressures have moderated in most economies with declining global commodity prices and easing of supply chain pressures. However, core inflation remains sticky and driven by high service inflation. Many central banks have hinted at the peaking of the interest rate hike cycle. The ECB has already cut the policy rate, while the Fed has hinted at reducing the rate in 2024. If the services inflation across economies moderates faster, that may allow central banks to bring forward the monetary policy easing cycle earlier than currently anticipated. A likely reduction in policy rates by central banks of AEs, especially the Fed, will open the space for central banks of EMEs to follow the lead, bringing down the cost of capital.

1.54 On the downside, any escalation of geopolitical conflicts in 2024 may lead to supply dislocations, higher commodity prices, reviving inflationary pressures and stalling monetary policy easing with potential repercussions for capital flows. This can also influence RBI's monetary policy stance. The global trade outlook for 2024 remains positive, with merchandise trade expected to pick up after registering a contraction in volumes in 2023. Conversely, increased fragmentation along geopolitical lines and renewed thrust on protectionism may distort merchandise trade growth, impacting India's external sector. Global financial markets have scaled new heights, with investors betting on global economic expansion. However, any corrections in the elevated financial market valuations may have ramifications for household finances and corporate valuation, negatively impacting growth prospects. Hiring in the information technology sector had slowed down considerably in FY24, and even if hiring does not decline further, it is unlikely to pick up significantly. However, leveraging the initiatives taken by the government and capturing the untapped potential in emerging markets, exports of business, consultancy and IT-enabled services can expand. Despite the core inflation rate being around 3 per cent, the RBI, with one eye on the withdrawal of accommodation and another on the US Fed, has kept interest rates unchanged for quite some time, and the anticipated easing has been delayed.

1.55 Domestic growth drivers have supported economic growth in FY24 despite uncertain global economic performance. Improved balance sheets will help the private sector cater to strong investment demand. A note of caution is warranted here. Private capital formation after good growth in the last three years may turn slightly more cautious because of fears of cheaper

imports from countries that have excess capacity. While merchandise exports are likely to increase with improving growth prospects in AEs, services exports are also likely to witness a further uptick. A normal rainfall forecast by the India Meteorological Department and the satisfactory spread of the southwest monsoon thus far are likely to improve agriculture sector performance and support the revival of rural demand. However, the monsoon season still has some ways to go. Structural reforms such as the GST and the IBC have also matured and are delivering envisaged results. Considering these factors, the Survey conservatively projects a real GDP growth of 6.5–7 per cent, with risks evenly balanced, cognizant of the fact that the market expectations are on the higher side.

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MONETARY MANAGEMENT AND FINANCIAL INTERMEDIATION: STABILITY IS THE WATCHWORD

02

CHAPTER

India's banking and financial sectors have displayed a stellar performance in FY24. Double-digit and broad-based growth in bank credit, gross and net non-performing assets at multi-year lows, and improvement in bank asset quality highlight the government's commitment to a healthy and stable banking sector. Capital markets are becoming prominent in India's growth story, with an expanding share in capital formation and investment landscape on the back of technology, innovation, and digitisation. Indian stock market was among the best-performing markets, with India's Nifty 50 index ascending by 26.8 per cent during FY24, as against (-)8.2 per cent during FY23. The market capitalisation of the Indian stock market has seen a remarkable surge, with the market capitalisation to GDP ratio being the fifth largest in the World. Supported by regulatory measures and the vision to achieve 'Insurance for all by 2047', India is poised to emerge as one of the fastest-growing insurance markets over the next five years. The pension sector witnessed a robust increase in subscribers and assets under management.

While the outlook for India's financial sector appears bright, some areas will require focused attention going forward. The significant increase in retail investors in the stock market calls for careful consideration. This is crucial because the possibility of overconfidence leading to speculation and the expectation of even greater returns, which might not align with the real market conditions, is a serious concern. For a developing economy such as India, the financial sector needs to support the banking sector and fill the gap in capital required for the economy's growth. Therefore, the financial sector should expand at a pace that is in lockstep with economic growth. In particular, India can ill-afford the economy's over financialisation at its current development stage.

The increased retail participation in financial markets and familiarity with financial products are beginning to grow in line with India's emergence as the world's fifth-largest economy. Therefore, firms operating in banking, insurance, and capital markets must keep the interests of the consumers in mind and improve their service quality through fair selling, disclosure, transparency, reliability, and responsiveness. Their internal appraisal and incentive systems must be in alignment with these considerations. It is in their interest and in the interest of the nation that they optimise their commercial goals over the long run.

INTRODUCTION

2.1 The Indian economy's financial and banking sectors have shown strong performance despite continuous geopolitical challenges. The Central Bank maintained a steady policy rate throughout the year, with the overall inflation rate under control. The effects of the monetary tightening following the Russia-Ukraine conflict are evident in the lending and deposit interest rates increase among banks. Bank loans saw significant and widespread growth across various sectors, with personal loans and services leading the way.

2.2 Capital markets have also shown impressive results, with India's stock market capitalisation to GDP ratio ranking fifth globally.¹ The presence of a robust Digital Public Infrastructure (DPI) and the greater involvement of banks and microfinance institutions (MFIs) have contributed to improved financial inclusion. The insurance and pension sectors are also doing well, as indicated by their expanding coverage.

2.3 Against this backdrop, the chapter is divided into two parts-Monetary developments and financial intermediation. The monetary developments part presents the monetary and liquidity conditions of the economy.

2.4 The financial intermediation part offers a discussion on the state of various financial institutions and financial market instruments that form part of the financial market milieu in India. Section I of this part presents the performance of the country's banking sector, which is the most critical pillar of the financial intermediation landscape. Section II highlights the Government's mechanism for dealing with distressed assets and how the Insolvency and Bankruptcy Code, 2016 (IBC/Code) has emerged as a game-changer in resolving insolvencies. Section III discusses the Government's approach towards financial inclusion with increased emphasis on digital financial inclusion and data protection. Section IV highlights the role of MFIs in facilitating financial inclusion and promoting inclusive growth. Section V discusses the securities markets, which have come a long way to become an alternative and efficient means of resource mobilisation for the corporate sector and the Government. The global stature of India's securities markets in using technology and best practices in regulations is a matter of pride. Section VI concerns the International Financial Services Centre, Gujarat International Finance Tec-City (IFSC GIFT City) and how it is emerging as a global financial and IT service hub. Sections VII and VIII present the developments in the insurance and pension sectors. Section IX discusses the government's mechanism to ensure regulatory coordination and overall financial stability, highlighting the role of the Financial Stability and Development Council (FSDC). Section X provides an overall conclusion and the outlook for the financial sector while mentioning the key challenges to tackle going forward.

¹ As per the World Federation of Exchanges (WFE)

MONETARY DEVELOPMENTS

2.5 Monetary policy plays a crucial role in determining the economic conditions of a country through its influence on macroeconomic indicators such as economic growth, inflation, and investments. The primary objective of monetary policy is to maintain price stability while keeping in mind the objective of growth. Various instruments of monetary policy, viz. cash reserve ratio (CRR) and statutory liquidity ratio (SLR) of banks, open market operations of the Central Bank, and imposition of credit ceilings, etc., are used by the central bank in the direction of this overall objective. This section of the chapter presents the recent monetary developments in the economy, focussing on the emerging liquidity conditions and monetary policy transmission in terms of lending and deposit rates of banks.

Monetary and Credit Conditions

2.6 Monetary and credit conditions evolved in line with the monetary policy stance during the year, supporting domestic economic activity. The Monetary Policy Committee (MPC) maintained the status quo on the policy repo rate at 6.5 per cent in FY24. It focused on withdrawing accommodation to ensure that inflation gradually aligns with the target while supporting growth. With the cumulative policy repo rate hike of 250 basis points (bps), undertaken between May 2022 and February 2023, working its way through the economy, the MPC kept the policy repo rate unchanged at 6.5 per cent since February 2023, but with readiness to undertake appropriate and timely policy actions if the situation so warrants.

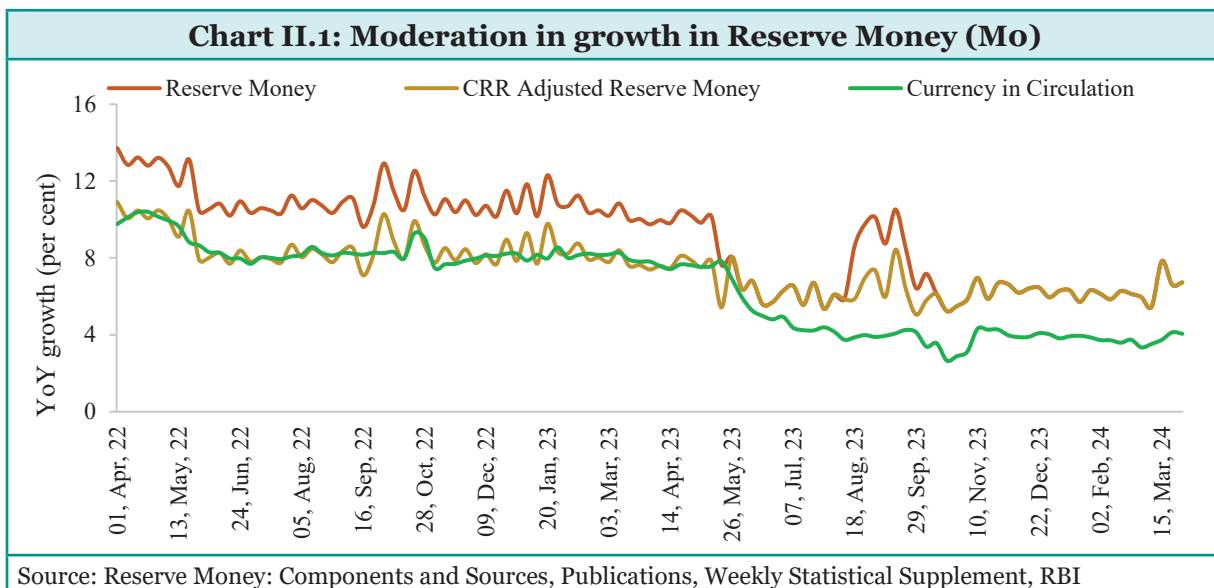
2.7 Important factors impacting the evolution of monetary and credit conditions during FY24 were the withdrawal of ₹2,000 banknotes (May 2023)², the merger of HDFC, a non-bank with HDFC Bank (July 2023), and the temporary imposition of the incremental CRR (I-CRR) (August 2023). The expansion in reserve money and currency in circulation (CiC) moderated due to the return of a predominant part of ₹2,000 banknotes to the banking system as deposits. As per the Reserve Bank of India (RBI), the total value of ₹2,000 banknotes in circulation has declined from ₹3.56 lakh crore as of 19 May 2023 (when the withdrawal of ₹2,000 banknotes was announced) to ₹7,581 crore as of 28 June 2024, indicating that 97.87 per cent of the ₹2,000 denomination banknotes have returned to the banking system.³ This and an increase in term deposit rates contributed to an acceleration in aggregate deposits and broad money (M3). The growth in CiC moderated to 4.1 per cent from 7.8 per cent YoY in the last year, reflecting the impact of the withdrawal of ₹2,000 banknotes.

2.8 Reserve Money (Mo) recorded a year-on-year (YoY) growth of 6.7 per cent as of 29 March 2024, compared to 9.7 per cent in the previous year. Mo, adjusted for the first-round impact of

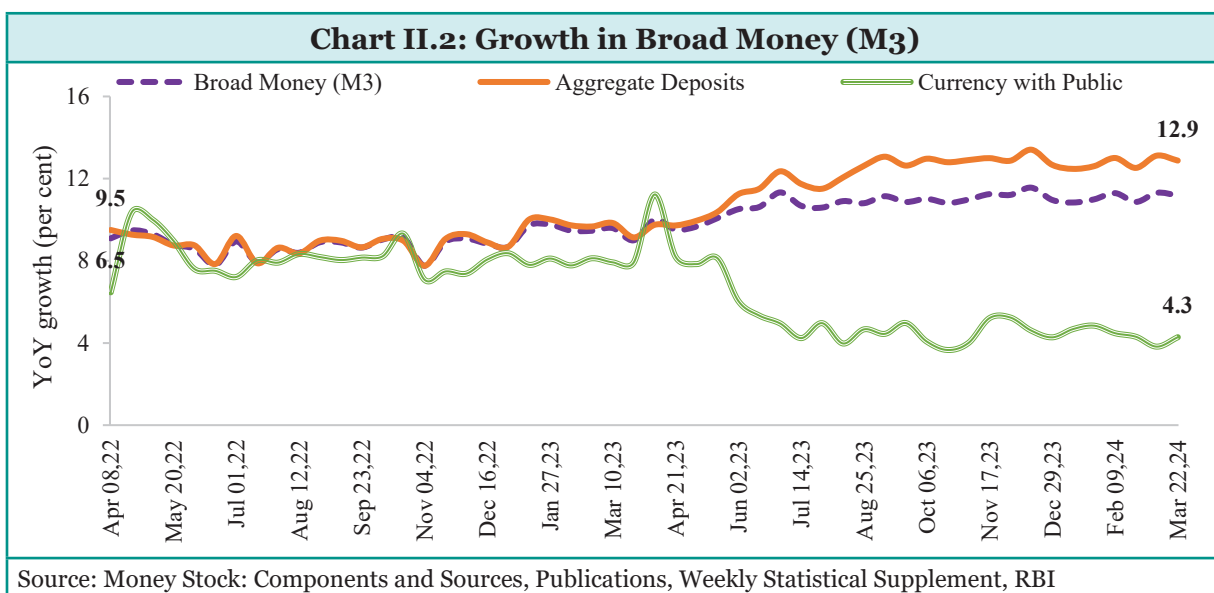
2 Vide circular dated 19 May 2023 https://www.rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=55707, RBI announced the withdrawal of ₹2000 banknotes from circulation since (i) about 89% of the ₹2000 denomination banknotes were issued before March 2017 and are at the end of their estimated life-span of 4-5 years; (ii) the total value of these banknotes in circulation has declined from ₹6.7 lakh crore at its peak as of 31 March 2018 (37.3% of Notes in Circulation) to ₹3.62 lakh crore, constituting only 10.8% of notes in Circulation as of 31 March 2023; (iii) this denomination is not commonly used for transactions, and (iv) the stock of banknotes in other denominations continues to be adequate to meet the currency requirement of the public.

3 RBI press release dated 1 July 2024, 'Withdrawal of ₹2000 Denomination Banknotes – Status', https://www.rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=58199

changes in the CRR, recorded a 6.7 per cent growth compared with 7.4 per cent a year ago. The increase in MO was mainly driven by net foreign assets (NFA) during FY24.



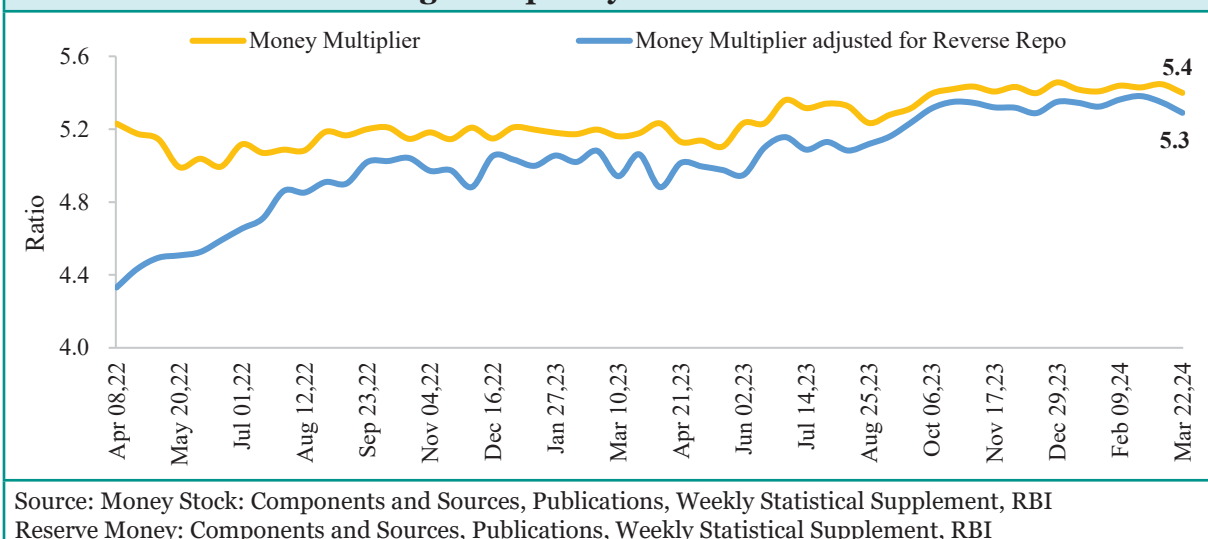
2.9 The growth in Broad Money (M₃), excluding the impact of the merger of HDFC with HDFC Bank (with effect from 1 July 2023), was 11.2 per cent (YoY) as of 22 March 2024, compared to 9 per cent a year ago. On the components side⁴, aggregate deposits (AD), the most significant component, contributed most to the expansion of M₃. Amongst sources, bank credit to the commercial sector significantly contributed to the increase in M₃, with a share of 67.1 per cent as of 22 March 2024, supplemented by net bank credit to the Government. (share of 29.4 per cent)⁵



⁴ Components of Broad Money=Currency with the Public + Aggregate Deposits (Demand Deposits with Banks + Time Deposits with banks + 'Other' deposits with Reserve Bank)

⁵ 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- Banking Sector's Net Non-Monetary Liabilities)

Chart II.3: Higher Money Multiplier in FY24, indicating higher liquidity in the market



2.10 As of 22 March 2024, the Money Multiplier (MM) was 5.4 against 5.2 a year ago. Adjusted for reverse repo amounts, analytically akin to banks' deposits with the Central Bank, the adjusted MM was marginally lower at 5.3 as of March 2024.⁶

Liquidity conditions and trends in policy rates

2.11 The RBI's liquidity management involved two-way operations in response to shifts in liquidity conditions. During FY24, 17 fortnightly Variable Rate Reverse Repo (VRRR) auctions and seven Variable Rate Repo (VRR) auctions were undertaken as the primary operation. In addition, 49 fine-tuning operations (25 VRRR and 24 VRR) were conducted intermittently, modulating liquidity conditions in alignment with the monetary policy stance. Amidst tightened liquidity conditions, banks also took recourse to the marginal standing facility (MSF). Given the extensive deployment of surplus funds under the standing deposit facility (SDF) and simultaneous recourse to the MSF, reversal of liquidity facilities under both the SDF and the MSF was allowed even during weekends and holidays, effective 30 December 2023.⁷

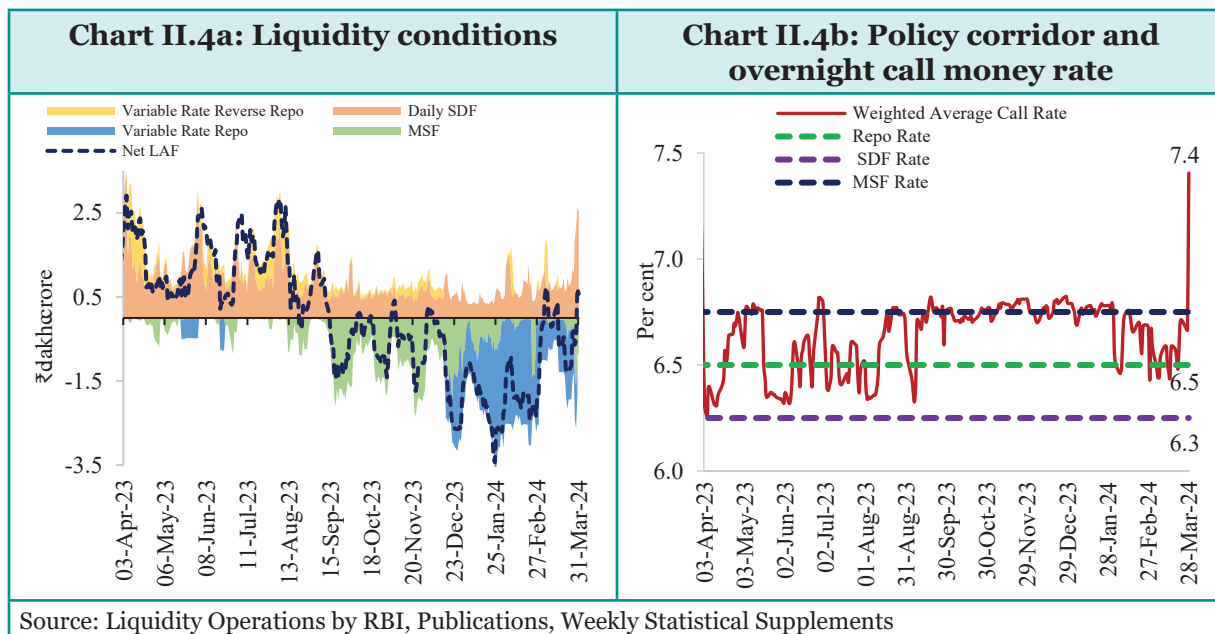
2.12 Taking cognisance of risks that excess liquidity can pose to price and financial stability and the increase in the surplus liquidity, inter-alia, due to the return of ₹2,000 banknotes to the banking system, the RBI announced a temporary I-CRR of 10 per cent on 10 August 2023⁸. The I-CRR, which impounded about ₹1.1 lakh crore from the banking system, was reviewed on 8 September 2023 and discontinued in a phased manner, ending 7 October 2023. The impounded amount was thus released to the banking system ahead of the festival season in line with the announcement on the Developmental and Regulatory Policies of 10 August 2023. As a result of these actions, the banking system's liquidity moderated, becoming a deficit in mid-September, which persisted during FY24.

⁶ Money Multiplier (MM) refers to the amount of M3 a bank generates with each rupee of Mo available to them. It depicts the relationship between the monetary base and the economy's money supply, indicating how fast the money supply will grow from the bank's lending activity. Higher the value of the MM, the higher the liquidity in the market and vice versa.

⁷ This measure will be reviewed after six months or earlier if needed.

⁸ RBI Governor's Statement: 10 August 2023, para 18, https://www.rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=56175

Moderation in liquidity conditions



Monetary policy transmission

2.13 Lending and deposit rates of scheduled commercial banks (SCBs) increased further during FY24, reflecting the lagged impact of the policy rate hikes during May 2022-February 2023, the external benchmark-based lending rate system of loan pricing and the moderation of surplus liquidity. During the current tightening cycle, i.e., from May 2022 to May 2024, the external benchmark-based lending rate and the one-year median marginal-cost-of-funds-based lending rate increased by 250 bps and 175 bps, respectively. The transmission of hike in policy rates to lending and deposit rates is given in Table II.1.

Table II.1: Pick-up in transmission to domestic lending and deposit rates

	May-22 to May -24	Apr-23 to Mar-24
WALR-Outstanding Rupee Loans	1.14	0.11
WALR-Fresh Rupee Loans	1.88	0.05
WADTDR-Outstanding Rupee Deposits	1.90	0.73
WADTDR-Fresh Rupee Deposits	2.44	0.14

Source: Lending and Deposit Rates of SCBs, RBI Press Release (various issues)

Note: WALR: Weighted average lending rate

WADTDR: Weighted average domestic term deposit rate

FINANCIAL INTERMEDIATION

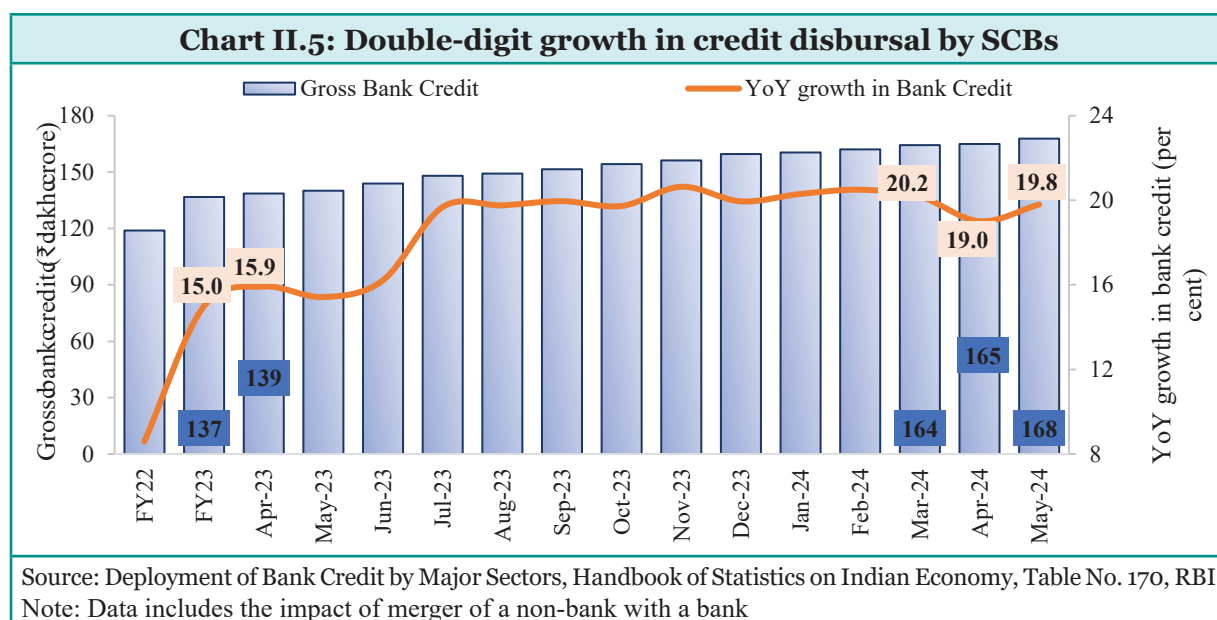
2.14 Financial development and economic growth are inextricably linked, and financial intermediation is the pathway through which the former translates into the latter. Financial intermediation helps in the efficient allocation of limited resources. Renowned economist Joseph Schumpeter believed that the services provided by financial intermediaries, viz. mobilising

savings, extending credit, storing assets, growing them, managing risk, and facilitating transactions, were essential for technological innovation and economic development.⁹ Financial intermediation also facilitates and encourages the inflows of foreign capital. Empirical studies¹⁰ show that efficient and developed financial markets can lead to increased and inclusive economic growth by improving the allocation and utilisation of savings and ensuring access to finance to all sections of society, including vulnerable groups and small and medium-sized firms.

2.15 Financial development parameters should not only be sound, but they also ensure the system's financial stability as a whole. This requires indicators such as Capital to Risk (Weighted) Assets Ratio (CRAR), liquid assets to deposits, and short-term credit to be within manageable limits. Further, an essential part of financial sector development is implementing robust policies for regulation and supervision of all the financial market entities, market players, and financial instruments. Coordinating amongst Regulators is paramount in this regard.

Performance of the banking sector and credit availability

2.16 The soundness and resilience of India's banking sector have been underpinned by ongoing improvements in asset quality, enhanced provisioning for bad loans, sustained capital adequacy, and a rise in profitability. Credit growth remains robust, mainly driven by lending to services and personal loans. As mentioned in para 2.9-2.10, deposit growth has also gained momentum due to the transmission of previous rate increases, resulting in the repricing of deposits and higher accretion to term deposits. Lending by non-banking financial companies (NBFCs) accelerated, led by personal loans and loans to the industry, and their asset quality has improved.



9 Schumpeter, Joseph A. *The Theory of Economic Development*, (Cambridge, MA: Harvard University Press, 1911).

10 Arestis, P., & Demetriades, P. (1997). Financial development and economic growth: Assessing the evidence. *The Economic Journal*, 107(142), 783–799; Aziakpono, M. J. (2011). Financial development and economic growth: Theory and a survey of evidence. *Studies in Economics and Econometrics*, 35(1), 15–43.; Calderón, C., & Liu, L. (2003). The direction of causality between financial development and economic growth. *Journal of Development Economics*, 72(1), 321–334.

2.17 Bank credit growth has sustained momentum during FY24, with broad-based growth across sectors. Credit disbursement by SCBs stood at ₹164.3 lakh crore, growing by 20.2 per cent at the end of March 2024, compared to 15 per cent growth at the end of March 2023. The trend is continuing in FY25, as reflected in a 19 per cent and 19.8 per cent YoY growth in bank credit in April and May 2024.

Sectoral credit growth

2.18 Growth in credit to agriculture and allied activities was in double digits during FY24. Agricultural credit had increased nearly 1.5 times from ₹13.3 lakh crore in FY21 to ₹20.7 lakh crore in FY24. The Kisan Credit Card (KCC) scheme has played a pivotal role in providing timely and hassle-free credit to farmers, with over 7.4 crore operative KCC accounts at the end of 2023.¹¹ Increased credit disbursement to the agricultural sector continued in April and May 2024 with bank credit to agriculture and allied sectors growing by 19.7 per cent and 21.6 per cent YoY, respectively

2.19 Industrial credit growth picked up in H2 of FY24, registering 8.5 per cent growth in March 2024, compared to 5.2 per cent a year ago, driven by an increase in bank credit to small and large industries. The boost in credit disbursement to Micro, Small and Medium Enterprises (MSMEs) has been supported by the availability of collateral-free loans with a 100 per cent credit guarantee under the Emergency Credit Linked Guarantee Scheme (ECLGS). Further, the availability of enriched and timely credit data and rapid implementation of digital lending infrastructure have significantly contributed towards enhancing lender confidence. Box II.1 discusses the measures undertaken by the Government to ensure credit availability to MSMEs and their success. In the future, the development of new technologies, such as the Open Credit Enablement Network (OCEN)¹², are expected to boost credit flow to the MSME sector.

Box II.1: Enhancing the flow of bank credit to MSMEs through formalisation

Improving credit flow to the MSME sector at low cost has been a policy priority of the Government and RBI. Various initiatives have been undertaken in this regard. These are elaborated below¹³:-

- **Introduction of Trade Receivables Discounting System (TReDS):** TReDS is a digital platform that facilitates the discounting of MSMEs' trade receivables through multiple financiers- Banks and NBFCs- to meet liquidity and working capital requirements. Cumulatively, 98.9 lakh invoices amounting to ₹2.9 lakh crore have been discounted on TReDS platforms, as of 31 March, 2024 supporting MSMEs for better liquidity and working capital management.

11 PIB Press Release of Ministry of Finance dated 27 December 2023, <https://shorturl.at/EqWwK>

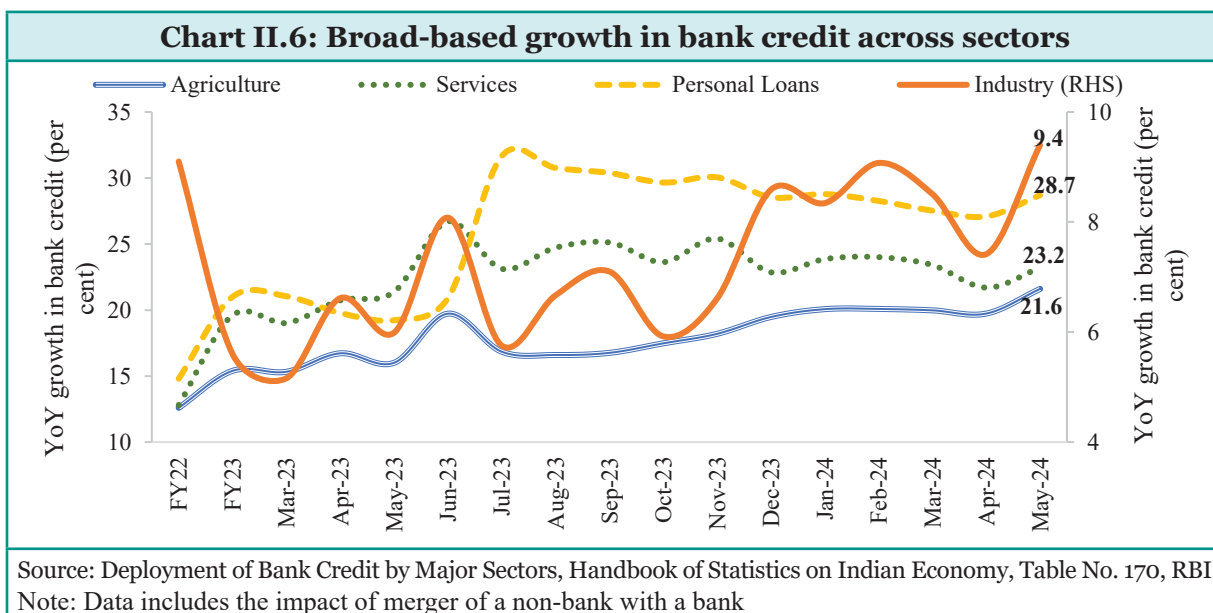
12 OCEN is a decentralised open credit network that codifies the flow of credit between borrowers, lenders, and credit distributors under a common set of standards. It is expected further to strengthen the digital public infrastructure of the country

13 This box write up is based on information/data from the Ministry of MSME and UDYAM Portal, <https://www.msme.gov.in/>, <https://udyamregistration.gov.in/>

- **Change in definition of MSMEs:** From 1 July 2020, MSMEs are defined as per a composite criterion of turnover and investment in plant and machinery/equipment. This is envisaged to bring a large number of entrepreneurs under the ambit of the formal banking sector, which will facilitate the flow of credit to the industry at subsidised rates.
- **Registration of MSMEs on Udyam Portal:** The Ministry of MSMEs launched the Udyam Registration Portal (URP) on 1 July 2020 and since then has established itself as an essential enabler for ease of doing business, as it is free of cost, simple and online. This was done to bring entrepreneurs under the ambit of the formal banking sector, which will facilitate the flow of credit to MSMEs at subsidised rates. However, one challenge with URP is the registration of Informal Micro Enterprises (IMEs) which are sizeable in number. As per the 73rd National Sample Survey, 6.3 crore unincorporated non-agricultural entities existed in FY16, primarily micro-enterprises. Since IMEs do not have a PAN/GST, they cannot register on URP and avail themselves of the benefits of Government programmes. To formalise such enterprises, the Ministry of MSME, in collaboration with the Small Industries and Development Bank of India (SIDBI), launched the Udyam Assist Platform (UAP) on 11 January 2023. Through formalisation, informal micro enterprises will be linked to various facilities such as access to markets and credit etc. As of June 2024, 1.86 crore IMEs have been onboarded on UAP. More than 4.5 crore enterprises have been registered on URP and UAP as of 3 June 2024.
- **Revamp of Credit Guarantee Scheme (CGS) for MSEs:** In the Union Budget FY23, the revamp of the CGS for Micro and Small Enterprises (MSEs) was announced with a required infusion of funds to facilitate an additional credit of ₹2 lakh crore for MSEs. Accordingly, the CGS was revamped with an infusion of ₹9,000 crore in the corpus of Credit Guarantee Fund Trust for MSEs. Subsequently, the credit limit under the said scheme was enhanced from ₹2 crore to ₹ 5 crore, with a minimum annual guarantee fee of as low as 0.37 per cent per annum. Consequently, credit guarantees worth ₹3 lakh crore were approved during FY23 and FY24 against the target of ₹2 lakh crore in four years. During FY23, out of the guarantees of ₹1.04 lakh crore, ₹16,373 crore and ₹2,750 crore were extended to women and SC/ST-owned enterprises, respectively. Guarantees worth ₹2.02 lakh crore were extended in FY24, out of which ₹32,223 crore and ₹5,393 crore were extended to women & SC/ST-owned enterprises, respectively.

To ensure credit availability to IMEs, w.e.f 14 February 2024, the Ministry of MSME made a special provision under the existing CGS for MSEs providing that IMEs registered on UAP can avail of credit up to ₹20 lakh without primary security and with 85 per cent guarantee coverage and a reduced annual guarantee fee. Additionally, initiating legal action is not required for financial institutions to invoke the guarantee.

2.20 Bank credit disbursement to the services sector remained resilient despite a slowdown in credit growth to NBFCs. Within the services sector, credit disbursement to the ‘commercial real estate’ and ‘trade’ sub-sectors improved in H2 of FY24. Personal loans and NBFCs have the largest share of credit disbursed by banks. Within personal loans, housing loan growth remained range-bound during FY24, with signs of improvement in April and May 2024.



2.21 Credit disbursement for housing loans increased from ₹19.9 lakh crore in March 2023 to ₹27.2 lakh crore in March 2024. Credit growth in personal loans can be attributed to the significant digitalisation of the ecosystem with increased use of credit bureaus for faster decisions, data collation and validation and e-commerce transactions. However, personal loan growth moderated after December 2023 due to increased capital requirements for unsecured personal loans, credit cards and lending to NBFCs by the RBI from 100 per cent to 125 per cent.^{14, 15}

Improvement in asset quality of banks

2.22 There has been a significant enhancement in the asset quality of banks, led by improved borrower selection, more effective debt recovery and heightened debt awareness among large borrowers.¹⁶ In addition to regulatory capital and liquidity requirements, qualitative metrics such as enhanced disclosures, robust code of conduct, and transparent governance structures have also improved banking performance.

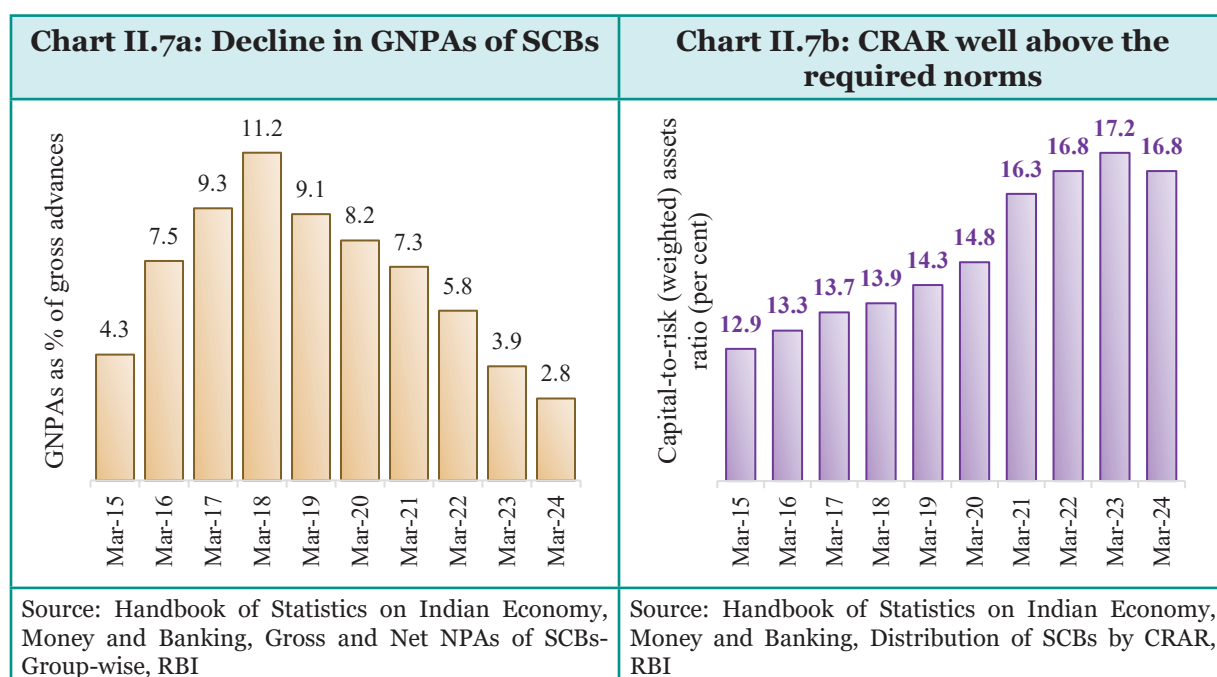
2.23 The gross non-performing assets (GNPA) ratio of SCBs continued its downward trend, reaching a 12-year low of 2.8 per cent at the end of March 2024 from its peak of 11.2 per cent in FY18. Lower slippages and a reduction in outstanding GNPA through recoveries, upgradations

¹⁴ RBI notification, 'Regulatory measures towards consumer credit and bank credit to NBFCs', dated 16 November 2023, <https://rbi.org.in/Scripts/NotificationUser.aspx?Id=12567&Mode=0>

¹⁵ As per the RBI Annual Report 2023-24

¹⁶ Ibid 15

and write-offs led to this decrease. The improvement in SCBs' asset quality has been broad-based. The GNPA ratio of the agriculture sector remains high at 6.5 per cent at the end of March 2024, but it has recorded persistent improvement during H2 of FY24. The GNPA ratio in the personal loans segment improved across all categories. Asset quality improved across all significant sub-sectors within the industrial sector, barring vehicles and transport equipment. Lower GNPA and high provisions accumulated in recent years contributed to a decline in net NPAs.



2.24 As SCBs bolstered their capital base by capitalising reserves from higher profits and raising fresh capital, their CRAR increased to 16.8 per cent at the end of March 2024. As of the end of March 2024, all banks met this as well as the CET-1 ratio¹⁷ requirement of 13.9 per cent, well above the regulatory minimum.

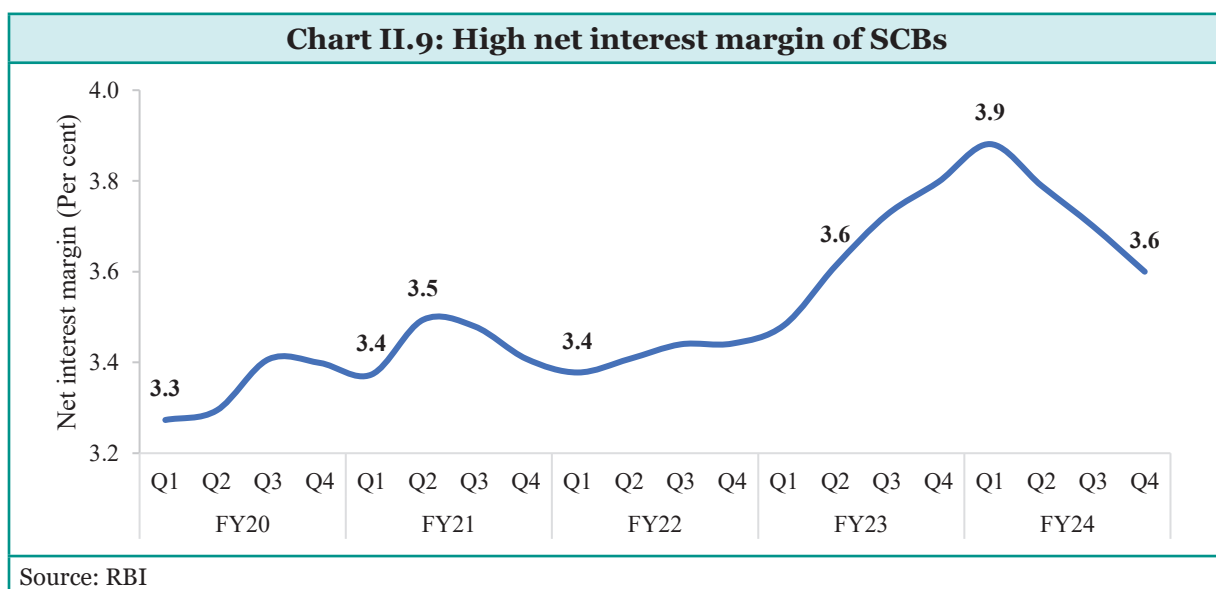
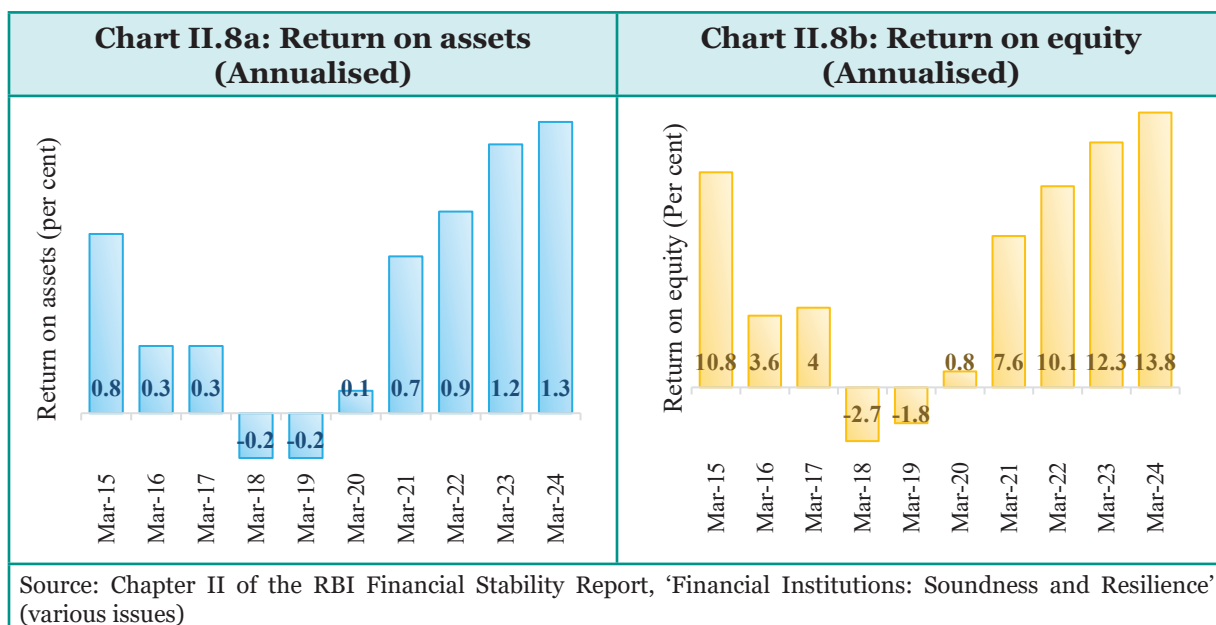
2.25 The net interest margin (NIM) of SCBs remained robust at 3.6 per cent in March 2024. With growing net interest income and other operating income and as the need for additional provisions fell, their profit after tax rose by 32.5 per cent (YoY) in March 2024, in spite of a large increase in operating expenses. Profitability indicators remained strong, with return on equity (RoE) and return on assets (RoA) ratios touching decadal highs in March 2024. Lagged effects of transmission of monetary policy rate increases and shifts in liquidity conditions led to a 100 basis points increase in the cost of funds as against the 75 basis points rise in the yield on assets in FY24. The yield on assets further improved due to the rise in interest rates.

2.26 It is important to note that in its annual report on ‘Trend and Progress of in Banking in India 2021-22’, RBI observed that a high NIM is negatively correlated with financial stability. Still, the threshold above which a high NIM is antithetical to financial stability is 5 per cent. The

¹⁷ Common Equity Tier 1 refers to the sum of common shares (equivalent for non-joint stock companies) and stock surplus, retained earnings, other comprehensive income, qualifying minority interest and regulatory adjustments

NIM of SCBs is well below that. It peaked at 3.9 per cent in Q1 of FY24, after which it moderated to 3.6 per cent as of March 2024.

Consistent improvement in performance indicators



2.27 India’s banking sector has shown remarkable resilience. The macro-and micro-prudential measures by RBI and the Government have enhanced risk absorption capacity in recent years, improving the banking system's stability. The RBI’s Basic Statistical Returns 2 (Deposits with SCBs) reveal that as of March 2024, 56.9 per cent of India’s deposits are with Public Sector Banks (PSBs). 61.1 per cent of total deposits are owned by households considered sticky retail customers; therefore, deposit withdrawals in this category, in case of an adverse event, are likely to remain limited. Second, for the top 10 Indian banks in asset size, loans constitute more

than 50 per cent of their total assets, making banks immune to the rising interest rate cycle. Third, after a phase of recapitalisation and cleaning up of bank balance sheets during the past years, there is a visible improvement in various banking indicators. The CRAR for the top 10 SCB (based on asset size) has been well above Basel III Norms. Fourth, interest rate cycles have been quite prominent in India, aligning with RBI's financial conditions and goal to maintain economic stability and manage inflationary pressures. The exposure to regular interest rate cycles has made Indian banks well-equipped to handle the cycles.

2.28 Based on the analysis mentioned above, it is seen that the Indian banking system remains sound and resilient, backed by high capital adequacy ratio, improved asset quality and robust earnings growth. The trend of improvement in the profitability of SCBs, which began in FY20, continued for the fifth consecutive year in FY24. This has been aided by higher income and lower provisions and contingencies.

Dealing with distressed assets

2.29 The ability to resolve stress in the market is a measure of an economy's soundness, and the ability to do so in the face of an economic slowdown is an essential indicator of the economy's resilience. The last decade saw Indian commercial banks face a crisis due to the significant burden of NPA. As of March 2016, the GNPA ratio of the public sector banks was 14.5 per cent. The other side of this was the plateauing of the bank debt, which fuelled an increase in corporate leverage, leading to the twin-balance sheet problem. Maximum stress was in the industry and infrastructure sectors.

2.30 The Government has paid close attention to resolving stress in banks and corporations over the past decade. Measures such as strengthening the banking regulatory framework, amending the recovery laws, enacting comprehensive insolvency and bankruptcy legislation, and establishing a public sector asset reconstruction company were implemented. These measures have nursed the credit sector back to sound health, and the GNPA ratio shrunk to 2.8 per cent in March 2024.

2.31 The emergence of stress in the market due to the operation of market forces and the subsequent business/venture failures is a sign of an active and dynamic economy. Since banks form the most significant and predominant source of finance for businesses in India, banks need to be equipped to deal with the flow of distressed assets, and the markets need to be equipped to channel investments into the reconstruction and revival of such assets.

2.32 Banking regulations provide for monitoring and timely identification of stressed assets, and RBI has taken several measures to strengthen its prudential framework. Regulations also provide measures to address stress at its initial stages through restructuring and rescheduling loans. The broad contours of these options form a part of banks' risk management tool kit. Banking regulations form the first line of defence and measures to address stress. The RBI updates them in response to market needs and economic conditions.

Conventional channels of recovery and reconstruction

2.33 The recovery routes viz., Debt Recovery Tribunals (DRTs) and the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act, 2002, form the second line of measures available to address stress. During FY23, around 45 per cent of the reduction in GNPA of SCBs was contributed by recoveries and upgradations.¹⁸

2.34 The Asset Reconstruction Companies (ARCs)¹⁹ regulated under the SARFAESI Act are emerging as an alternative channel for investors, including FPIs, to access the NPAs/distressed assets held by banks. During FY23, 28 ARCs were operating in the market.²⁰ Such acquisition is done by issuing security receipts (SRs), and ARCs are mandated to take at least 15 per cent of the SRs issued or 2.5 per cent of the total SRs issued, whichever is higher. The regulatory framework has allowed the ARCs to participate as resolution applicants under the IBC process subject to certain conditions. It has thereby allowed harnessing the synergies and complementarities of the two market channels of asset reconstruction. During FY23, 9.7 per cent of the previous year's stock of SCBs' GNPA was sold to ARCs, compared to only 3.2 per cent in FY22. The number of SRs ultimately redeemed increased during FY23, indicating enhanced recovery through this mode.

2.35 The prerequisites for an efficient market for the NPAs are that it should be deep, competitive and have adequate liquidity. The market has to have enough investors to ensure that the price discovery of the NPAs is efficient. It has to have adequate liquidity to support acquisition from the banks and support asset's turn-around. Apart from direct measures taken to reduce the GNPA, the Government is building systemic strength in the market with market-based interventions to improve liquidity and competition by establishing a bad bank and encouraging the insolvency and bankruptcy ecosystem.

2.36 The Securities and Exchange Board of India (SEBI) has implemented several measures to improve liquidity in the market for distressed assets. FPIs are permitted to invest in debt instruments issued by companies undergoing resolution and in SRs issued by ARCs. No minimum investor limit or residual maturity requirement is imposed on FPIs for these investments. These measures have led to an increase in FPI investment in SRs issued by ARCs from around ₹10,000 crore to ₹14,482 crore during FY22²¹. SEBI also opened a particular route in 2022, the Special Situation Fund, a sub-component of the Alternative Investment Funds, to participate in the distressed asset market. It allowed these investment vehicles to invest in SRs issued by ARCs and to act as resolution applicants under the IBC process subject to certain conditions. With increased access to funds, market participants are likely to invest in more NPAs/distressed assets, and the recovery rate for banks is expected to be higher.

¹⁸ RBI Report on Trend and Progress of Banking in India 2022-23, Page 80, <https://shorturl.at/dOXt1>

¹⁹ ARCs are entities registered with the RBI and are permitted to acquire financial assets, including loans, advances, bonds, guarantees and letters of credit from banks/financial institutions for reconstruction

²⁰ <https://tinyurl.com/56vmwnkv>

²¹ RBI Report on Trend and Progress of Banking in India 2021-22, <https://shorturl.at/yx9n4>

Increasing competition in the distressed asset market

2.37 To deepen the distressed asset market further, the Government, in July 2021, set up the National Asset Reconstruction Company Ltd. (NARCL) and India Debt Resolution Company Ltd. (IDRCL). NARCL acquires assets from banks, and the Government guarantees back the SRs issued against these assets. The India Debt Resolution Company Ltd (IDRCL) has an exclusive arrangement with NARCL to resolve assets acquired by the latter. The IDRCL is mandated to identify the appropriate resolution strategy for the asset and to aid NARCL in optimal resolution outcomes. The assets acquired by the NARCL clear the bank balance sheets immediately, freeing capital for further lending.

2.38 NARCL has so far acquired 18 accounts with loan exposure of around ₹92,000 crore²², which includes the acquisition of the ailing Srei Infrastructure Finance Ltd and Srei Equipment Finance Ltd as resolution applicants. While offers on assets worth ₹1.25 lakh crore are at different stages of acquisition, due diligence, and evaluations for assets of around ₹40,000 crore are underway. The establishment of a government-backed company for the aggregation and resolution of distressed assets will further improve liquidity and competition in the market.

Addressing distressed assets through insolvency resolution

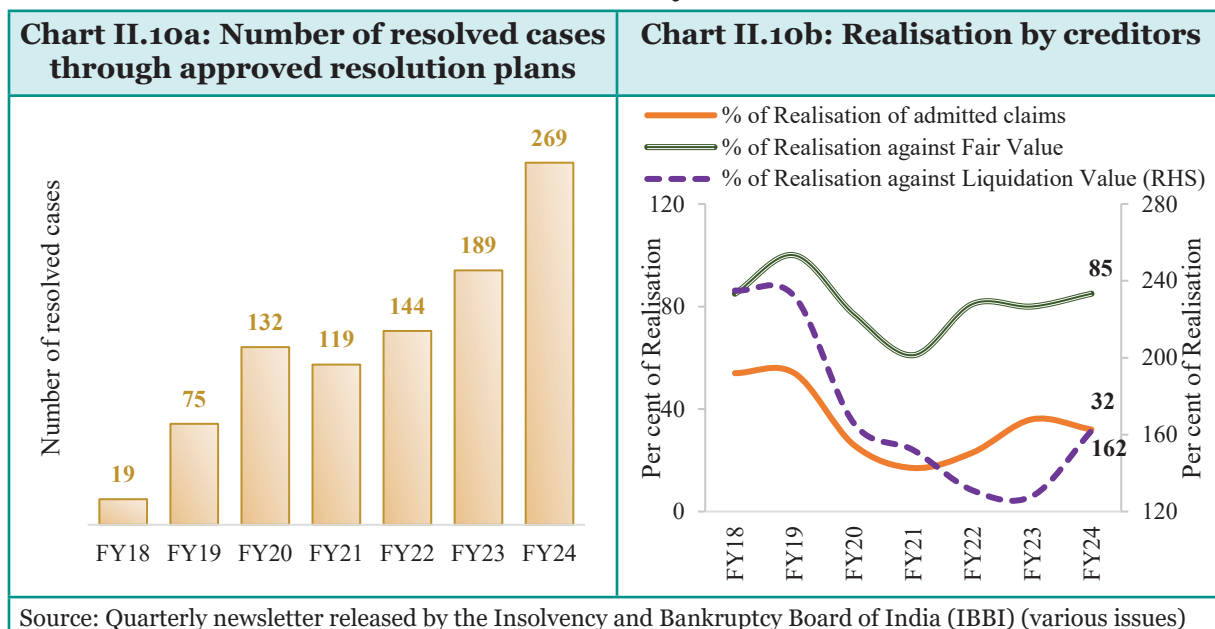
2.39 The IBC has been recognised as an effective solution for the twin balance sheet problem, where banks are under the stress of NPAs while corporates are overleveraged and unable to repay their debt. The Code provides for addressing financial distress early in time. It mandates the insolvency professional to conduct the insolvency process and run the operations of the distressed corporate debtor. At the same time, the committee of creditors steers the resolution process and all significant decisions, thus reducing further erosion of value during the process itself. By design and operation, the Code balances the needs of all stakeholders. IBC has provided an avenue for corporate debtors to resolve their debt and get an honourable exit from failed business endeavours, thus promoting ease of doing business and encouraging entrepreneurship. The Code has established itself as an effective solution for addressing banks' stress by aiding in significantly reducing GNPA and helping rescue failing corporate debtors. It has offered fresh impetus to the recovery segment of the financial markets and the reconstruction of failed/distressed assets in the real sector. In the eight years since 2016, 31,394 corporate debtors involving a value of ₹13.9 lakh crore have been disposed of (including pre-admission case disposals) as of March 2024. The loss of control immediately after admission into the resolution process has led debtors to settle with creditors as soon as the applications are filed with the National Company Law Tribunal (NCLT). A singularly notable fact is that ₹10.2 lakh crore of underlying defaults were addressed at the pre-admission stage.²³ This change in debtor

²² Data of the Department of Financial Services

²³ Source: IBBI newsletter, January-March 2024, <https://ibbi.gov.in/uploads/publication/21aa7620a9e809f7a20b432eec89888b.pdf>

behaviour has been a big boon for banks and other lending institutions. The Code has created an optimal incentive-disincentive mix to facilitate above-board and transparent dealings in creditor-debtor relations.

Remarkable progress in cases resolved under the IBC and realisation by creditors



2.40 The Code uses the corporate insolvency resolution processes (CIRPs) to identify the best means to resolve a distressed asset. It has facilitated the successful closure of 4,131 CIRPs until March 2024. 3,171 corporate debtors have been rescued, of which 947 cases have been resolved through approved resolution plans, which brought in a realisable value of ₹3.36 lakh crore. In the resolved cases, the creditors recovered approximately 32 per cent of their claims. This amounted to a recovery of 85 per cent of the fair value and 162 per cent of the liquidation value of assets.

2.41 The impact of IBC on the health of the financial markets is evident as it is the dominant recovery route for SCBs today.²⁴ As per the RBI’s Report on Trends and Progress of Banking in India, 2022-23, the IBC held a share of 43 per cent of the total amount recovered by SCBs in FY23. In the six years since FY18, the IBC has enabled over ₹3 lakh crore recovery for the SCBs, more than what they have recovered through the Lok Adalats, DRTs, and the SARFAESI Act.

2.42 More significant to the real sector is that over 3,000 businesses have emerged out of the CIRP, with continued business operations extending the productive use of resources trapped due to financial distress in these corporate debtors. A study conducted by the Indian Institute of Management, Ahmedabad, reports²⁵ that the resolved firms that went through the resolution process under the Code have witnessed a significant improvement in their performance in

²⁴ It is important to note that the foremost objective of the Code is resolution of stressed corporate debtors. Recovery of claims is only incidental to the process of resolution.

²⁵ IIM Ahmedabad report, ‘Effectiveness of the Resolution process: From Outcomes in the Post-IBC Period’, <https://ibbi.gov.in/uploads/resources/59f737b213b4700cc16428aefd62869a.pdf>

terms of increase in tangible assets and average capex in the post-resolution period compared to the pre-resolution period, the aggregate market valuation of resolved firms rose from around ₹2 lakh crore in the pre-resolution phase to ₹6 lakh crore in the post-resolution phase. There is a substantial increase in total employment and around a 50 per cent increase in the average employee expenses in the resolved firms (listed) in the three years post-resolution. It is hard to find another policy measure that has created winners.

2.43 As of March 2024, the total CIRPs ending in liquidation were 2,476. Around 77 per cent of these corporate debtors were defunct at the beginning of the process and were, on average, valued at 7 per cent of the outstanding debt. The liquidation process provides a last window of opportunity for the revival of the asset through a going concern Sale/Compromise/Arrangement to maximise the value rescued. Around 50 businesses have been rescued at this last resort. 586 firms were dissolved at the end of the liquidation process, releasing whatever resources were needed for alternate uses.

2.44 Nine of the twelve large accounts²⁶ referred by the RBI for resolution under the IBC have been resolved. The resolution plans for these corporate debtors yielded 54 per cent of the claims admitted. These debtors included steel and power majors such as Electrosteel Steels Ltd., Bhushan Steel Ltd., Monnet Ispat & Energy Ltd., Essar Steel India Ltd., Bhushan Power & Steel Ltd., etc., and their resolutions played a significant role in the revival of the steel sector. The framework under Section 227 of the IBC provides for the resolution of financial service providers, and, at present, NBFCs, including Housing Finance Companies with asset size of ₹500 crore or more, are covered. The framework has enabled the resolution of Dewan Housing Finance Corporation Ltd., Srei Equipment Finance Limited and Srei Infrastructure Finance Limited under this framework. In each case, the creditors have recovered around 42 per cent of the claims. Box II.2 discusses the role of the IBC process in resolving financial stress of real estate companies.

Box II.2: Role of IBC in reviving stalled real estate projects and strengthening homebuyers' rights

Before 2016, the only remedy available for homebuyers whose housing projects were stalled for various reasons was through the Consumer Forums established under the Consumer Protection Act of 1986. In FY24, over 5,500²⁷ cases were filed with the National Consumer Dispute Redressal Commission, and almost 21 per cent were related to the housing sector. However, the number of cases resolved through the consumer redressal route has been minimal. It was estimated that 4.1 lakh dwelling units in real estate projects across the country involving ₹4.1 lakh crore were under stress.²⁸

²⁶ The first set of corporate debtors referred by RBI for resolution under the IBC.

²⁷ CONFONET Dashboard at <https://cms.nic.in/ncdrcusersWeb/dashboard.do?method=loadDashBoardPub> as reflected on 21 May 2024

²⁸ Model Building Bye-Laws 2016 Towns and Country Planning Organisation, Ministry of Housing and Urban Affairs, [https://mohua.gov.in/upload/uploadfiles/files/report\(1\).pdf](https://mohua.gov.in/upload/uploadfiles/files/report(1).pdf)

The year 2016 saw the enactment of the Real Estate (Regulation and Development) Act 2016 (RERA Act). This provided a dedicated grievance redressal mechanism to the aggrieved homebuyers and a means to rein in errant real estate contractors and companies. Subsequent enactment of the IBC in the same year opened another channel and has been the most favoured among the three available remedies. As of March 2024, over 1500 real estate companies were admitted into the insolvency resolution process under the IBC, accounting for 21 per cent of total admissions. One in four cases settled after admission was also from this sector. Of the 891 corporate debtors resolved, 133 were real estate companies, forming 15 per cent of the companies resolved.

Insolvency resolution of real estate companies posed a unique set of challenges for the standardised corporate insolvency process. Real estate companies have multiple projects spread across geographies, projects at different stages of construction, and diversified business models. The large number of homebuyers across these projects meant claims from thousands of homebuyers who needed to be included in the process. The judiciary, the Government, and the market have recognised these difficulties and moved in cohesive steps to improve outcomes for these projects. The availability of two new remedial routes led to discord and friction in the system.

The Insolvency Law Committee, in its March 2018²⁹ report took cognisance of the peculiarity of the real estate sector. It recommended that the amount raised from homebuyers be considered financial debt as it formed a significant contribution to finances raised and had the commercial effect of borrowing. This led to substantial changes in the CIRP by making homebuyers a distinguished class of creditors and a part of the Committee of Creditors, enabling their direct participation in decision-making. A system to organise and derive decisions, through consensus of majority voting of the thousands of homebuyers, was also worked out to introduce insolvency professionals as authorised representatives. Further amendments enabled insolvency to be initiated by a joint application of not less than 100 allottees or not less than 10 per cent of the total number of allottees under the same project, ensuring that frivolous applications are not filed. As clarity emerged on the use of IBC as a remedy for homebuyers, it was also laid out that resolution plans approved for real estate projects should necessarily be compliant with the RERA Act, thereby restoring primacy to the sectoral law and the sectoral regulator in its domain for optimal oversight of the sector.

By way of innovation in economic law, the judiciary paved the way for solutions in resolving real estate corporate debtors. As a class of creditors, it enabled homebuyers to act as resolution applicants. It approved what was termed a “reverse CIRP”, where the corporate debtor could take measures to complete the project even as the resolution process was underway. The judiciary has allowed project-specific resolution plans, targeting the affected project alone under the same corporate debtor. This measure relieved the corporate debtors and allottees of different projects, and the market has responded positively.

²⁹ Ministry of Corporate Affairs report of the Insolvency Law Committee, March 2018, https://ibbi.gov.in/uploads/resources/ILRReport2603_03042018.pdf

Several real estate companies have successfully resolved and enabled the progress of stalled projects. In the case of Value Infracon India Private Limited, the resolution process yielded creditors 98 per cent of the claim value and 189 per cent of the asset's liquidation value.

In the cases of Ashiana Landcraft Realty Private Limited and Anudan Properties Private Limited, the resolutions yielded around 2.5 times the liquidation value of the assets. Large corporate debtors in the sector, like Jaypee Infratech Limited, have been resolved with a recovery of 88 per cent for creditors, and assets have been acquired at over 114 per cent of liquidation value.³⁰

Even as the pace of resolutions picked up under the IBC, there was still a need to channel/redirect investments into these stressed projects. To address this vital gap, the Government set up the Special Window for Affordable and Mid-Income Housing (SWAMIH) with a target corpus of ₹12,500 crore in 2019. It is a professionally managed Alternative Investment Fund (AIF) aimed at providing priority debt financing for the completion of stalled housing projects, including corporate debtors and projects undergoing the resolution process under the Code. As of April 2024, the SWAMIH Fund has delivered 32,000+ homes and the delivery of 20,000 homes every year for the next three years is being targeted.

The impact of seamless resolutions and progress of cases under IBC and improvement in liquidity through the AIF is reflected in the healthy balance sheets of banks, thereby enhancing their ability to lend further.

2.45 The Government has taken several measures to improve the insolvency ecosystem. It has strengthened the NCLT regarding infrastructure, increasing its strength by filling vacancies and proposing an integrated IT platform. The regulations have been amended to keep in line with the needs of the markets and the advances in judicial pronouncements. The IBC has established itself as an indispensable component of the asset recovery and reconstruction market. In the process, it has forever changed the credit market landscape in the country for good.

Financial inclusion is within reach; digital financial inclusion is the next goal

2.46 Financial inclusion is not just a goal but also a means to an end as an enabler for sustainable economic growth, reduction of inequality and elimination of poverty. The United Nations (UN) has positioned financial inclusion as a prominent enabler of other development goals in the 2030 Sustainable Development Goals (SDGs). Academic evidence states that financial inclusion can enhance overall economic growth and facilitate the achievement of different SDGs.

2.47 The Government has prioritised delivering financial services to the last mile. Given the low levels of financial inclusion and formal identification in 2008, the magnitude of the challenges facing India a little over a decade ago was immense. According to the World Bank's Global Financial Inclusion Database, India has made remarkable progress in its financial inclusion goals over the past ten years. The number of adults with an account in a formal financial institution increased from 35 per cent in 2011 to 77 per cent in 2021. There has been

³⁰ As per data as reflected in the summary of outcomes released by IBBI, <https://ibbi.gov.in/en/claims/cd-summary>

an increase in the percentage of adults saving in a financial institution and borrowing from formal sources. There is a decline in the access gap between the rich and the poor. Further, the gender divide in terms of financial inclusion has also narrowed. While progress has been made on gender in financial inclusion, India's youth are seeing the same benefits (Table II.2). Compared to South Asian and world averages, it is seen that India's performance is better in specific indicators (Table II.3).

2.48 Based on the bank account data and the relationship with GDP per capita, one rough estimate is that it would have taken 47 years to achieve 80 per cent of adults with a bank account had India solely relied on traditional growth processes.³¹

Table II.2: India's performance across indicators of financial inclusion and financial education

S.No.	Indicators of Financial Inclusion	2011	2021
1.	Adults with an account at a formal financial institution (% age 15+)	35	77
2.	Made or received a digital payment (% age 15+)	22*	35
3.	Borrowed from a formal financial institution, older (% age 15+)	8	12
4.	Account, poorest 40% (% age 15+)	27	78
5.	Account, richest 60% (% age 15+)	41	77
6.	Account, female (% age 15+)	26	78
7.	Account, male (% age 15+)	44	78
8.	Youth (age 15-24 years) made or received digital payment	19*	30

Source: World Bank's Global Financial Inclusion Database

Note: *data is for 2014, as data for 2011 is not available

Table II.3: A cross-country comparison of financial inclusion and financial education parameters

	Adults with an account at a formal financial institution (% age 15+)	Adults saving at a financial institution (% ages 25+)	Borrowed from a formal financial institution, older (% age 25+)
World	76	29	32
South Asia	68	11	12
Brazil	84	23	42
China	89	45	42
India	78	13	13
Indonesia	52	20	15
South Africa	85	37	20

Source: World Bank's Global Financial Inclusion Database, Data for 2021 (latest available)

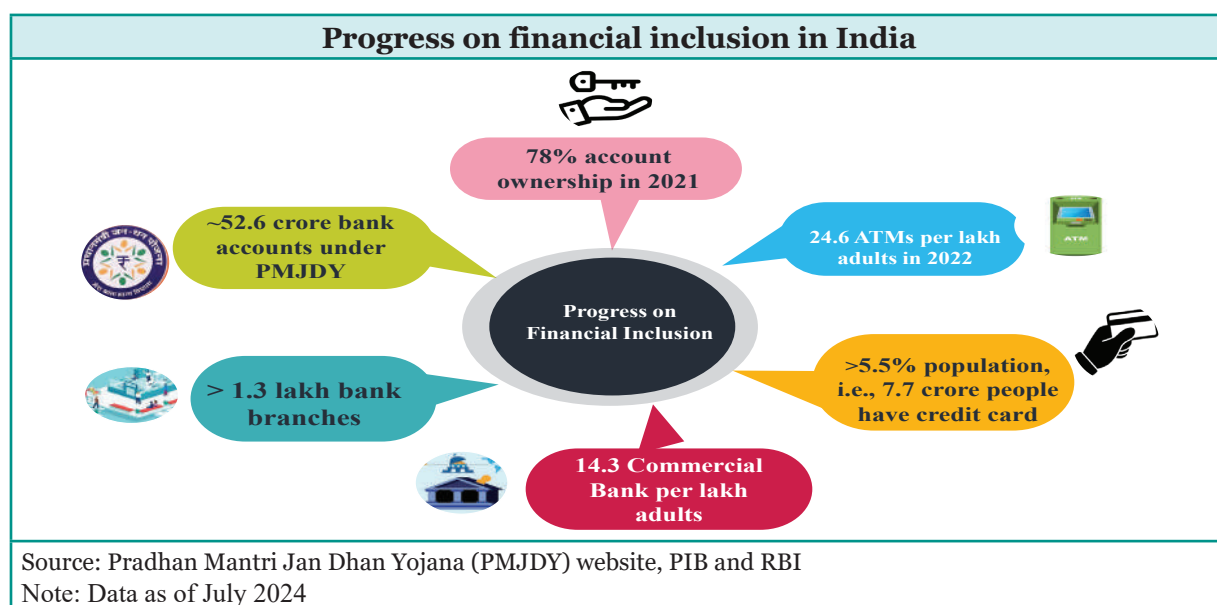
2.49 More recently, there has been a shift in focus of the financial inclusion strategy in the country, from 'every household' to 'every adult,' with added emphasis on the usage of accounts

³¹ BIS Papers No 106: The design of digital financial infrastructure: lessons from India by Derryl D'Silva, Zuzana Filková, Frank Packer and Siddharth Tiwari, Monetary and Economic Department, December 2019, (<https://www.bis.org/publ/bppdf/bispap106.pdf>)

by enhancing direct benefit transfer (DBT) flows through these accounts, promoting digital payments using RuPay cards, UPI etc. The RBI launched UPI123Pay in March 2022 as an option to make UPI payments for feature phones, and the National Payments Corporation of India (NPCI) introduced UPI Lite, an on-device wallet service provided by select banks that allows low-value transactions up to ₹200 through the BHIM app. These innovations are steps towards accelerating the digital adoption process in India by creating a more prosperous and inclusive ecosystem that can accommodate larger sections of the population. India is also collaborating with several countries to bring more efficiency to national and cross-border payment systems.

2.50 RBI has been collaborating bilaterally with various countries to link India's Fast Payments System (FPS), i.e., UPI, with their respective FPSs for cross-border Person to Person (P2P) and Person to Merchant (P2M) payments. The RBI joined Project Nexus, a multilateral international initiative to enable instant cross-border retail payments by interlinking domestic FPSs. The Nexus aims to connect the FPSs of four ASEAN countries (Malaysia, Philippines, Singapore, and Thailand) and India, who would be the founding members and first mover countries of this platform. An agreement to this effect was signed by the BIS and the central banks of the founding countries on 30 June 2024.³² The platform is expected to go live by 2026. Once functional, Nexus is expected to play an important role in making retail cross-border payments efficient, faster, and more cost-effective.

2.51 The main components of the RBI's strategy for financial inclusion have been a target-based approach, market development, strengthening infrastructure, innovation, and technology, last-mile delivery, consumer protection and financial literacy and awareness.³³ Following this strategy, the progress on financial inclusion so far is presented below:



³² BIS press release dated 1 July 2024, 'Project Nexus completes comprehensive blueprint for connecting domestic instant payment systems globally and prepares for work towards live implementation', <https://www.bis.org/press/p240701.htm>

³³ The RBI launched a National Strategy for Financial Inclusion 2019-2024, with the vision to help expand and sustain the financial inclusion process at the national level through a broad convergence of actions involving all the stakeholders in the financial sector. The strategy aimed to provide affordable access to formal financial services, broaden and deepen financial inclusion, and promote financial literacy and consumer protection.

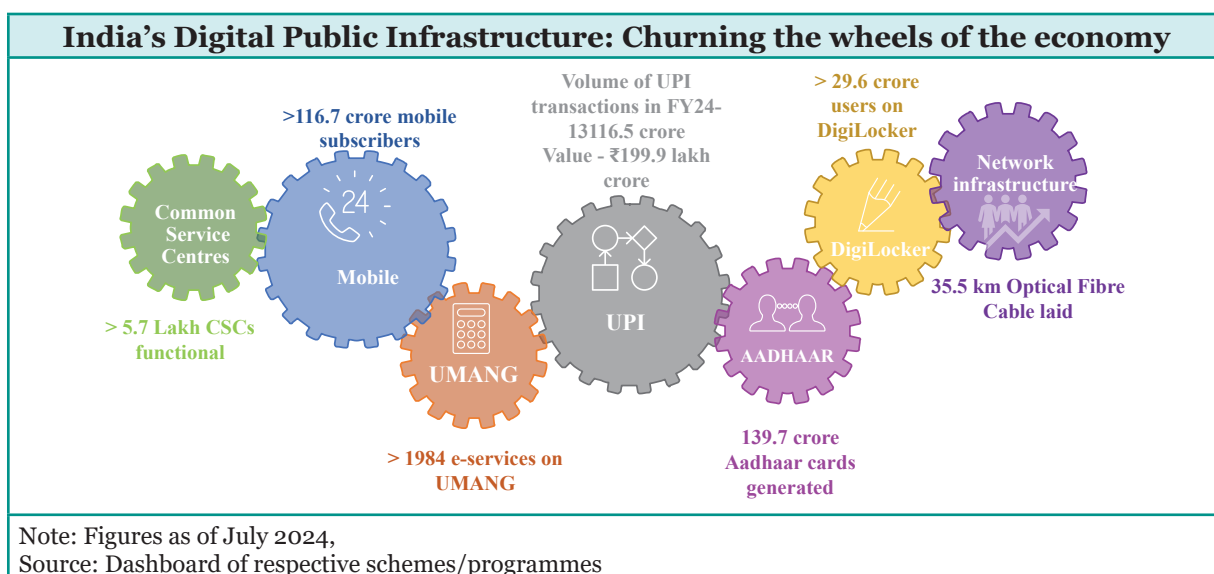
Digital Financial Inclusion

2.52 A key enabler of this financial inclusion drive has been the digitalisation of the financial system, which has catalysed the transformation of the financial services landscape worldwide. With financial services now available on tap on digital devices, the next big challenge is to ensure ‘Digital financial inclusion (DFI).’ DFI involves arranging cost-effective digital means to reach currently financially excluded and underserved citizens with a range of formal financial services suited to their needs. The essential components of DFI include the availability of digital transactional platforms to enable customers to make or receive payments and devices to enable such transactions. These retail agents have digital devices and additional financial services via a digital transactional platform.

2.53 While measures were afoot towards digitisation of financial services in India, the COVID-19 pandemic gave further momentum to the process when the most vulnerable and excluded citizens were severely affected. The Government, accordingly, encouraged innovation and developed a well-stacked digital infrastructure and technology-led system. This has evolved into an inclusive, cost-efficient, and responsible DPI.

2.54 With the objective of India emerging as a fintech nation, the Government has launched many flagship schemes such as the Digital India Mission, Make-in-India, etc. Greater emphasis has been given to the creation of DPI such as Aadhaar, e-KYC, Aadhaar-enabled Payment System, UPI, Bharat QR, DigiLocker, e-sign, Account Aggregator, Open Network for Digital Commerce, etc. These DPIs can be utilised on a shared basis by different players to ensure optimum outcomes. Their usage has brought transparency, scale operation and timely delivery of financial services to the public.

2.55 India's robust DPI has played a pivotal role in enabling the country's digital transformation, providing citizen-centric and transparent governance services. India's fast-growing population, world-class DPI, and proactive regulations have underpinned the Fintech industry's growth. India is among the fastest-growing fintech markets in the World, hailing as the third-largest growing fintech economy.



2.56 Advances in DFI have enabled millions of people in the formal and vast informal economy to accept payments, settle invoices, and transfer funds anywhere in the country with just a few screen taps. These advances are built on the India Stack, a comprehensive digital identity, payment, and data-management system. India Stack consists of three interconnected layers that provide a digital identity to every Indian while facilitating easy, cost-free, mobile-first digital transactions. The three critical components of India Stack³⁴ are the Identity Layer, payment layer and data governance layer. Regarding the identity layer, Aadhaar has been instrumental in transforming India's authentication ecosystem. It has facilitated the KYC process, reducing the cost of conducting e-KYC from USD 12 to 6 cents, extending banking to millions of Indians and improving financial inclusion. In the case of the payment layer, the UPI has revolutionised the country's payment system. The success of UPI has been enhanced by the expansion of smartphone usage in India, with more than 116.5 crore smartphone subscribers as of 31 March 2024.³⁵ The value of transactions conducted on the UPI platform has increased multifold from ₹0.07 lakh crore in FY17 to ₹200 lakh crore in FY24.³⁶ The data governance layer focuses on ensuring ownership and control over the user data to its rightful owners.

2.57 Digital credit can be a powerful agent for sustainable and inclusive growth by empowering individuals and firms to cultivate economic opportunities. According to the International Monetary Fund (IMF) research, an increase in digital financial inclusion in payments leads to a 2.2 per cent rise in average economic growth, likely driven through the consumption channel and higher formalisation.³⁷

Microfinance institutions: facilitating financial inclusion

'Access to formal finance can boost job creation, reduce vulnerability to economic shocks and increase investment in human capital. With adequate access to financial services, individuals and firms can rely on costly informal sources of finance to meet their financial needs and pursue growth opportunities. At a macro level, greater financial inclusion can support sustainable and inclusive socio-economic growth for all.'

- National Strategy for Financial Inclusion 2019-24, RBI

2.58 Microfinance refers to providing financial services, including small-value loans to households, small businesses and entrepreneurs who lack access to formal banking services. It is an effective tool for financial inclusion, which involves sustainably providing microfinance and related services to enable the poor and the marginalised to achieve social equity and empowerment. Microfinance has been playing an essential role in meeting low-income households' credit needs by providing affordable doorstep services. They have also played a

34 World Bank's blog, 'India digital transformation could be a game-changer for economic development', dated 2DFIO June 2023, <https://shorturl.at/Z2rL9>

35 Telecom Regulatory Authority of India (TRAI) report, 'Telecom Subscription Data as of 31 March 2024', page no. 6, https://www.trai.gov.in/sites/default/files/PR_No.23of2024_0.pdf.

36 National Payment Corporation of India, <https://www.npci.org.in/what-we-do/upi/product-statistics>

37 IMF Working Paper, June 2021, 'Is Digital Financial Inclusion Unlocking Growth', <https://tinyurl.com/2russwem>

role in extending other financial services like insurance, remittance, financial literacy, etc. Microfinance has emerged as one of the most important tools for fostering financial inclusion.

2.59 The evolution of the MFI sector in India has been substantially facilitated by the supportive regulatory framework of RBI coupled with the formulation of an Industry Code of Conduct by the Self-Regulatory Organisations (SROs), such as Sa-Dhan³⁸ and MFIN.³⁹ The New Regulatory Framework for Microfinance Loans issued by the RBI for the microfinance sector on 14 March 2022 ensures that all entities operating in the microfinance space are subject to the same regulations, creates a level playing field and safeguards the interest of the borrowers.

2.60 Globally, the Indian microfinance sector is the second largest after China in terms of number of borrowing customers in India, which are about three times that of the next biggest market, i.e., Indonesia. The Indian microfinance coverage (Self-Help Groups (SHGs) and Joint Liability Group (JLG)) is more than 50 per cent of households and 10 per cent of the Indian population.⁴⁰

Table II.4: India has the second-largest microfinance sector

Country	Savers (millions)	Borrowers (millions)	Outstanding loans (USD billion)
Bangladesh (June 2022)	66.4	44.6	17.4
Cambodia (December 2022)	2.7	2.1	9.7
Philippines (December 2020)	–	17.0	7.6
Indonesia (December 2019)	–	56.8	2.1
Pakistan (March 2023)	98.1	9.25	1.8
India (March 2023)			
SHGs	161	83	23.5
MFIs	–	73	44.0

Source: Data from different sources such as industry associations, central bank websites, and academic publications

2.61 As per the 2023 Bharat Microfinance Report, MFIs operate in 28 States, five UTs, and 646 plus districts in India. Two hundred and thirteen MFIs operate in India as of FY23, with a branch network of 25,790, engaging 2.2 lakh employees. Together, they have reached out to over 532 lakh clients with a total loan outstanding of ₹1.8 lakh crore under micro-credit.⁴¹ The addition of new clients reflects the continuing inclusion efforts of the sector and offers hope for the remoter and underserved geographies. As of 31 March 2023, the number of clients with

38 Sa-Dhan was recognised by the RBI as an SRO for the microfinance sector in the year 2015 to administer industry regulations, tools and performance standards for effective monitoring of MFIs, their compliance with regulations and the Code of Conduct in the best interest of clients. As an SRO, Sa-Dhan has been at the forefront of formulating and administering industry regulations, tools, and performance standards for effective monitoring of MFIs, their compliance with regulations and the Code of Conduct in the best interest of clients.

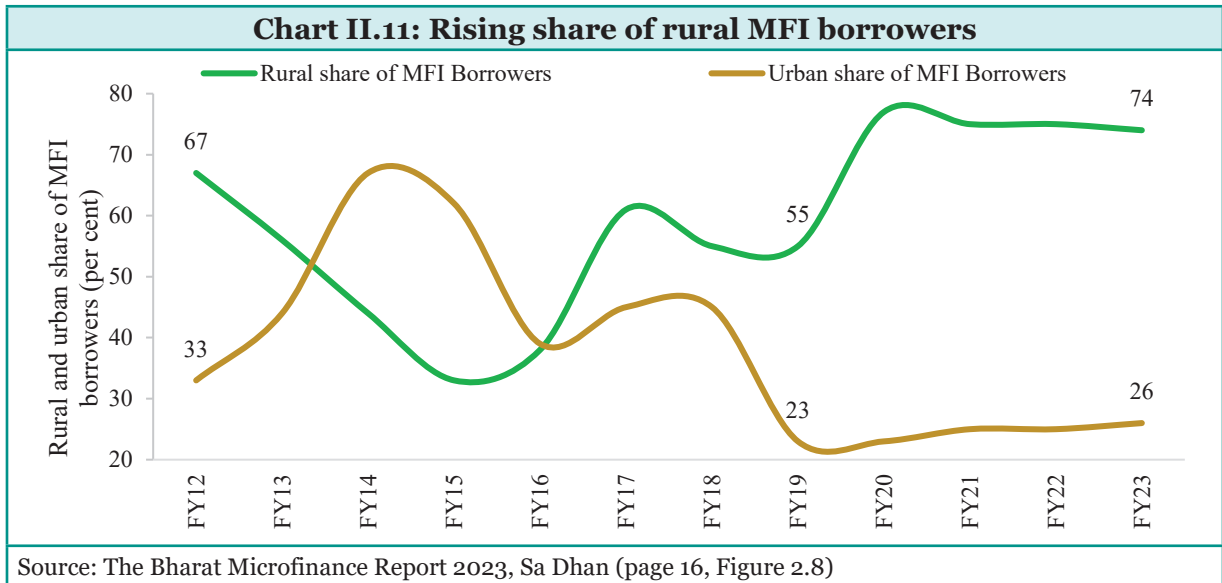
39 <https://mfindexia.org/>

40 Inclusive Finance India Report, 2023, Access Development Services, <https://inclusivefinanceindia.org/wp-content/uploads/2023/12/IFI-Report-2023.pdf>

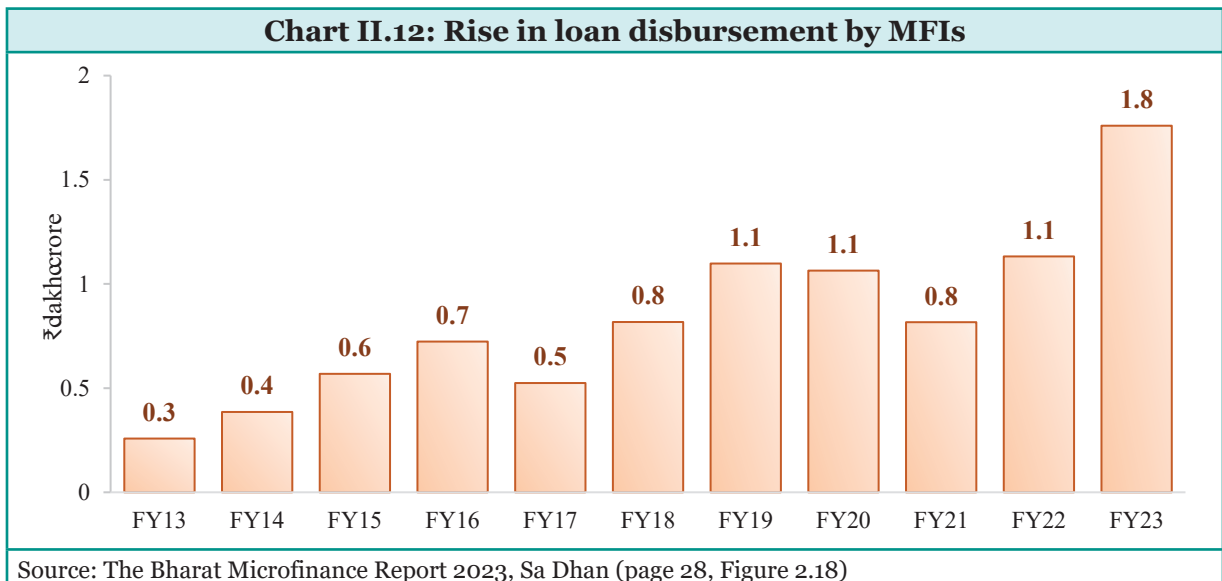
41 Bharat Microfinance Report, 2023, Sa-dhan, <https://rb.gy/hnq8zo>

loans outstanding with MFIs, including those overdue over 179 days, was 571 lakhs. Out of these, the active clients (excluding the clients having overdue over 179 days) served by MFIs stood at 532 lakhs, posting a YoY growth of 19 per cent.

2.62 Though MFIs serve both rural and urban poor, they are oriented more towards rural areas in India. Urban borrowers dominated for a while. There is a definite shift thereafter towards the rural sector, and it has continued for the last four years. The present share of the rural clientele is at 74 per cent.



2.63 Microfinance is mostly a woman-focused activity. Women constitute 98 per cent of the total clients of MFIs. Further, it also serves other weaker and marginalised sections like scheduled castes (SC), scheduled tribes (ST) and minorities in a significant way. The SC/ST borrowers constitute a substantial 23 per cent of the clients.



2.64 Disbursement of loans by MFIs recorded steady growth throughout, except in some years due to external events like the COVID-19 pandemic, etc. During FY23, the microfinance sector bounced back strongly, achieving an aggregate disbursement of ₹1.8 lakh crore, 55 per cent higher than the previous year.

2.65 The performance and profitability ratios of MFIs during FY23 provide a picture of good health and improving prospects of the industry. The industry managed to trim operating costs while retaining finance costs at more or less the same level as in previous years. The total assets of the MFIs stood at ₹1.5 lakh crore at the end of FY23, 30 per cent higher than the previous year. The sector has been going from strength to strength for the last few years, except for one or two years in between owing to some external events. In FY23, RoA and RoE stood at 2.5 per cent and 12.2 per cent for all MFIs, reflecting an improvement over the previous year. As per the RBI regulatory norms, NBFC-MFIs need to maintain at least 15 per cent of their risk-weighted assets in the form of capital. The capital adequacy of Indian MFIs is largely well above the prescribed norms, with the median CAR for FY23 at 26.5 per cent.

2.66 During FY23, good progress in enhancing portfolio quality has been achieved by the MFIs, as they have been able to rein in defaults, improve recoveries, and deal with chronic cases through settlements and write-offs. The Performance and Accountability Reporting (PAR) 30+ ratios for MFIs are moving towards pre-COVID levels but are still short of the lowest delinquency ratios achieved in FY19. The CRIF-Highmark analysis shows that, during FY23, MFIs were able to reduce forward flows of impaired loans⁴² from one bucket to the next in the case of 30, 60, and 90-day PAR. However, the forward flows in the 91 to 180-day buckets increased for MFIs and banks.⁴³

2.67 The success of the microfinance sector in rural India can be measured using several indicators. The most extensive microfinance programme, the SHG-Bank Linkage Programme (SHG-BLP), has captured the post-pandemic recovery through the number and amount of SHGs with loans outstanding with banks over FY22 and FY23. During FY23, the credit disbursement under SHG-BLP was ₹1.5 lakh crore, registering a growth of 45.6 per cent. The number of SHGs credit linked during FY23 increased to 43 lakh from 34 lakh in FY22. As of March 2023, the banking system held SHG savings to the tune of ₹58,893 crore with a growth of 24.7 per cent, with average savings per SHG amounting to ₹43,940.⁴⁴ The improvement in the RBI's Financial Inclusion Index from 60.1 in March 2023 to 64.2 in March 2024 indicates the strides being made in the area of access, usage, and quality of the financial sector in India.⁴⁵

42 An impaired loan is a loan that is not performing according to the original terms of the agreement.

43 Volume XXIII of CRIF Quarterly publication on Microfinance lending, 'MicroLend', March 2023, https://www.crifhighmark.com/media/2921/crif-microlend-vol-xxiii_mar-2023.pdf

44 Status of Microfinance in India 2022-23, <https://shorturl.at/Blzyn>

45 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 FI-Index comprises three broad parameters (weights indicated in brackets) viz., Access (35 per cent), Usage (45 per cent), and Quality (20 per cent), with each of these consisting of various dimensions, which are computed based on a number of indicators.

Trends in Indian capital markets

2.68 Despite heightened geopolitical risks, rising interest rates and volatile commodity prices, Indian capital markets have been one of the best performing among emerging markets in FY24, reflecting India's bright economic stature. Capital markets are becoming prominent in India's growth story, with an expanding share in capital formation and investment landscape on the back of technology, innovation, and digitisation. The following sections present the significant trends in primary markets, secondary markets, and institutional investment in India.

Primary Markets

2.69 Amid healthy domestic economic performance and a favourable investment climate, primary markets remained robust during FY24, facilitating capital formation of ₹10.9 lakh crore (which approximates 29 per cent of the gross fixed capital formation of private and public corporates during FY23), compared to ₹9.3 lakh crore in FY23. Of the total amount mobilised in FY24, 78.8 per cent was raised through debt issuances. Fund mobilisation through all three modes, viz., equity, debt, and hybrid, increased by 24.9 per cent, 12.1 per cent and 513.6 per cent, respectively, in FY24 compared to the previous year.

2.70 The number of initial public offers (IPOs) increased by 66 per cent in FY24 from 164 in FY23 to 272 in FY24, while the amount raised grew by 24 per cent (from ₹54,773 crore in FY23 to ₹67,995 crore in FY24). SME platforms at the exchanges witnessed heightened activities during FY24 as the number of IPOs/FPOs (Follow-on Public Offers) of SMEs increased by 1.6 times (from 125 in FY23 to 196 in FY24), while the corresponding fund raised rose by more than two and half times over the previous year (from ₹2,333 crore in FY23 to ₹6,095 crore in FY24). As per E&Y Global IPO trends report, Indian exchanges were global leaders in IPO listings. India's share consistently rose to 17 per cent in 2023 from 6 per cent and 11 per cent in 2021 and 2022, respectively.⁴⁶ Reflecting the buoyant market conditions, Qualified Institutional Placements (QIPs)⁴⁷ emerged as a critical equity fundraising mechanism for the corporates during FY24. Resource mobilisation through rights issues more than doubled to ₹15,110 crore during FY24, compared to ₹6,751 crore in the previous year.

Public debt issuances

2.71 The corporate debt market in India is going from strength to strength. During FY24, the value of corporate bond issuances increased to ₹8.6 lakh crore from ₹7.6 lakh crore during the previous financial year. The number of corporate bonds public issues in FY24 was the highest for any financial year so far, with the amount raised (₹19,167 crore) at a four-year high. Private placements remained the preferred channel for corporates, accounting for 97.8 per cent of total resources mobilised through the bond market. Increasing investor demand and the rise in

⁴⁶ E&Y Press Release on 'Indian stock exchanges rank first in the world in terms of the number of IPOs in 2023' dated 19 February 2024, <https://shorturl.at/Lj6Z3>

⁴⁷ QIP was introduced by SEBI in 2006, under which Indian listed companies can raise funds by issuing equity shares, fully or partially convertible debentures, or any other securities as mentioned under the notification by SEBI in this regard. Listed companies can raise capital without meeting the legal requirements like submitting the pre-issue filings to SEBI.

the cost of borrowing from banks have made these markets more attractive for corporates for funding requirements. The quantum of outstanding corporate bonds increased by 5.5 per cent YoY to ₹45 lakh crore (i.e., 15.5 per cent of GDP) at the end of March 2024.

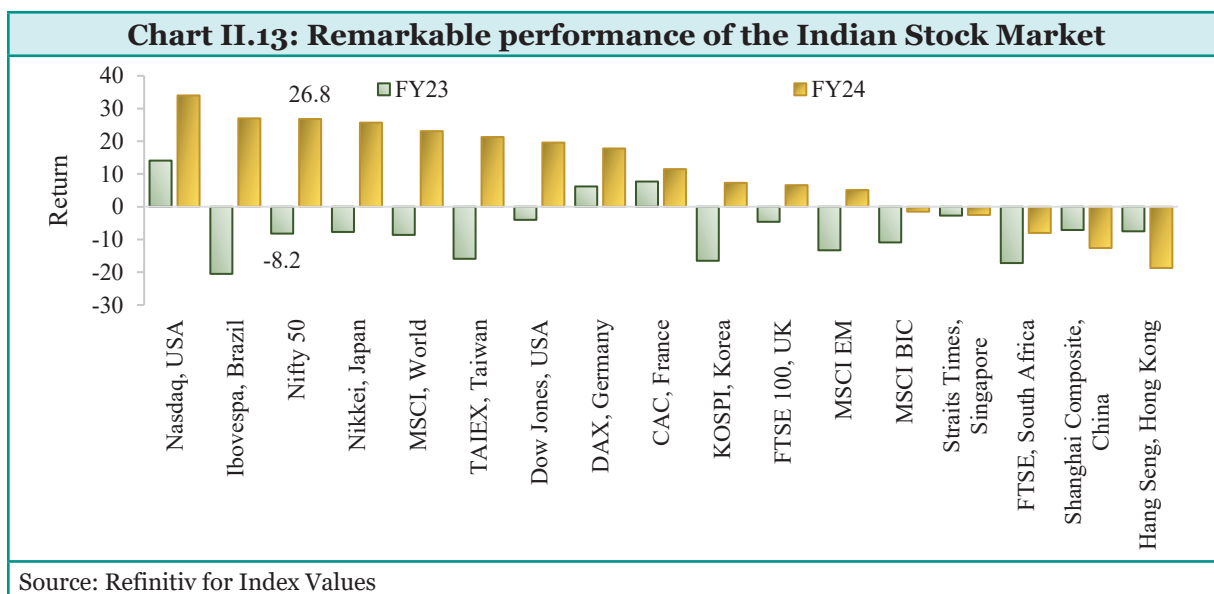
REITs and InvITs

2.72 During FY24, ₹39,024 crore was raised by Real Estate Investment Trusts (REITs) and Infrastructure Investment Trusts (InvITs), more than five times compared to FY23, supported by the Government's thrust on infrastructure development.

Secondary Markets

India among the best-performing markets

2.73 After enduring a highly turbulent global environment in FY23, global stock markets recovered and performed well during FY24. All the major markets, except China and Hong Kong, delivered better returns during the period compared to the previous year. Indian stock market was among the best-performing markets, with India's Nifty 50 index ascending by 26.8 per cent during FY24, as against (-)8.2 per cent during FY23. FY24 saw stellar performances from the US, Brazilian and Japanese markets among the global markets. There was evidence of an AI-led tech stock surge, with the tech-heavy US Nasdaq index rising by 34 per cent during FY24 after delivering heavy losses in FY23.



2.74 The exemplary performance of the Indian stock market compared to the world and emerging markets over the years can be primarily attributed to India's resilience to global geo-political and economic shocks, its solid and stable domestic macroeconomic outlook, and the strength of the domestic investor base. Mirroring the positive outlook on Indian markets, India's weight in the MSCI-EM index has increased to 17.7 per cent at the end of FY24 from 13.7 per cent at the end of April 23, the second-highest share among the EMs in the index.

2.75 The market capitalisation of the Indian stock market has seen a remarkable surge over the years. Significant interest from domestic and global investors in the Indian stock market as an attractive investment destination and sustained IPO activity placed the Indian market fifth in the world by market capitalisation in FY24. India's market capitalisation to GDP ratio has improved significantly over the last five years to 124 per cent in FY24, compared to 77 per cent in FY19, far higher than that of other emerging market economies like China and Brazil. It is essential to strike a note of caution. The market capitalisation to GDP ratio is not necessarily a sign of economic advancement or sophistication. Financial assets are claims on real goods and services. If equity market claims on the real economy are excessively high, it is a harbinger of market instability rather than market resilience.

2.76 The value traded increased across all segments in the exchanges, except currency derivatives during FY24, with increased investors' participation and positive market trends. Commodity derivatives turnover rose by 87 per cent in FY24, driven by an increase in turnover of options contracts of the energy segment.

Table II.5: Market capitalisation to GDP ratios across countries (percentage)

	India	China	Brazil	Japan	South Korea	United Kingdom	United States
Dec-19	77	60	65	121	89	106	159
Dec-20	95	79	68	129	122	92	197
Dec-21	113	80	50	136	127	108	208
Dec-22	105	65	42	126	96	91	158
Dec-23	124	61	44	147	114	71	179

Note: *GDP figures are taken from the World Federation of Exchanges (WFE), and market capitalisation is calculated as the sum of the market capitalisation of NASDAQ and NYSE

Source: CEIC Database, World Bank, WFE

2.77 Box II.3 discusses the initiatives undertaken to strengthen the capital markets through the use of technology, which have played a significant role in enhancing their performance and efficiency.

Box II.3: The synergy of technology and Indian capital markets: Driving growth and efficiency

Indian capital markets have witnessed a broad-based expansion across various sub-markets, with the country's equity market capitalisation reaching ₹415 lakh crore (USD 5 trillion) in May 2024, placing it fifth in the global rankings.

The proliferation of technology has been a critical catalyst in transforming economies worldwide, and the Indian capital markets have been no exception. The sector has continuously transformed over the past few years, leveraging technological advancements to facilitate growth and efficiency.

Technology plays a role in meeting the market regulator SEBI's three goals: market regulation, investor protection, and market development.

Individual investors today are over 9.5 crore and have nearly 10 per cent direct ownership of the market through its almost 2500 listed companies. This translates to around ₹36 lakh crore of wealth as of March 2024, apart from indirect ownership in equity mutual funds that have ₹28 lakh crore in assets under management (AuM). In this manner, technology allows exchanges to help allocate capital to firms and millions of market investors to invest in companies they have never visited and participate in their long-term success and wealth creation. Overall, the market capitalisation in India has risen by over 100 times in the last three decades.

Technological advancements such as India Stack and regulatory measures have fuelled an unprecedented surge in retail investor participation and activity. The prevalence and proliferation of user-friendly trading apps, mobile-friendly educational resources, and financial market guidance have democratised access to the capital markets.⁴⁸ The seamless use of technology has empowered investors to open trading and demat accounts online within minutes, trade from the comfort of their homes, access investment reports, and raise queries online efficiently. Initiatives such as the SEBI Complaints Redress System (SCORES), a platform for investor grievance resolution, and Securities Market Trainers (SMARTs) a program for investor education, have been instrumental in safeguarding the interests of market participants, particularly first-time investors.

Technology has also played a crucial role in market development. India's unique digital architecture has imbued the capital market regulator with the confidence to switch to the "T+1 settlement regime" comfortably, a feat followed by very few countries worldwide.⁴⁹ The introduction of "Interoperability" among clearing corporations (CCs) created a one-to-many relationship between stock exchanges and CCs that reduced trading costs via better margin utilisation and capital resources of the participants.⁵⁰ Indian capital markets have also adopted on a pilot basis the "Application Supported by Blocked Account" facility in the secondary market, which allows investors to block funds in their bank until trade confirmation. A recent initiative of the National Securities Depository Limited (NSDL) titled NSDL-CAS has further eased the investors' lives by presenting an aggregated view of assets held in demat format across multiple accounts and mutual fund folios.⁵¹

Beyond growth, investor safety, and market development, business continuity today has become a critical aspect of capital markets. Initiated in 2022, the "Disaster Recovery (DR)

48 Explained: What's driving increased retail participation in the Indian stock market? Livemint (2024), link available at: <https://tinyurl.com/3xetmuvt>

49 Indian equity markets have even transitioned to same-day settlement cycles ("T+0") in a limited manner, becoming the first nation to do so. The transition to shorter settlement cycles has increased efficiency and reduced settlement risk.

50 Interoperability among clearing corporations, PWC (2019)

51 Enhancing Investor Centric Services through Technology and Education, AIBI Summit (2022)

45” framework allows the continuation of trading using existing connectivity parameters in case of unforeseen events with minimal switching time.⁵² In consultation with SEBI, stock exchanges and brokers have implemented various measures to address technical glitches in stockbrokers' electronic trading systems, such as the "LAMA (Log Analytics and Monitoring Application) reporting" API, a monitoring platform to overview the IT structure and perform analytics thereof.⁵³ Additionally, clearing corporations like NSCCL and ICCL⁵⁴ have worked on two-way portability to be operated as a "SaaS" (Software as a Service) model to manage unforeseen software failures.⁵⁵

While the synergy of technology and capital markets has unlocked significant benefits, evolving challenges must be addressed. Privacy concerns, cybersecurity risks, and the rising digital divide in the population are some issues that require attention. Nonetheless, regulators have been steadfast in their approach, realising that unlocking the maximum potential from the marriage of technology and capital markets is essential for the overall growth and development of the Indian economy.

Retail Participation in the Capital Market

2.78 The Indian capital markets have seen a surge in retail activity through direct (trading in markets through their accounts) and indirect (through mutual funds) channels in the last few years. The individual investor's share in the equity cash segment turnover was at 35.9 per cent in FY24. The number of demat accounts with both depositories rose from 1,145 lakh in FY23 to 1,514 lakh in FY24. The impact of this influx of individual investors in the market is also reflected in new investor registrations with the exchanges, their share in total traded value, net investments, and ownership in the listed companies. For instance, the registered investor base at NSE has nearly tripled from March 2020 to March 2024 to 9.2 crore as of 31 March 2024, potentially translating into 20 per cent of the Indian households now channelling their household savings into financial markets.

Mutual Funds (MFs): Accelerating the financial savings and retail participation in capital markets

2.79 A rise in retail participation was more substantial and steadier through the indirect channel via mutual funds. FY24 has been a spectacular year for MFs as their AuM of the MFs increased by ₹14 lakh crore (YoY growth of 35 per cent) to ₹53.4 lakh crore at the end of FY24, boosted by mark-to-market (MTM) gains and expansion of the industry. The total number of folios increased from 14.6 crore at the end of FY23 to 17.8 crore at the end of FY24. Barring income/debt-oriented schemes, all categories of MF schemes witnessed net inflows. Inflows into growth/equity-oriented and hybrid schemes accounted for more than 90 per cent of net

⁵² <https://www.nseindia.com/trade/disaster-recovery-faqs>

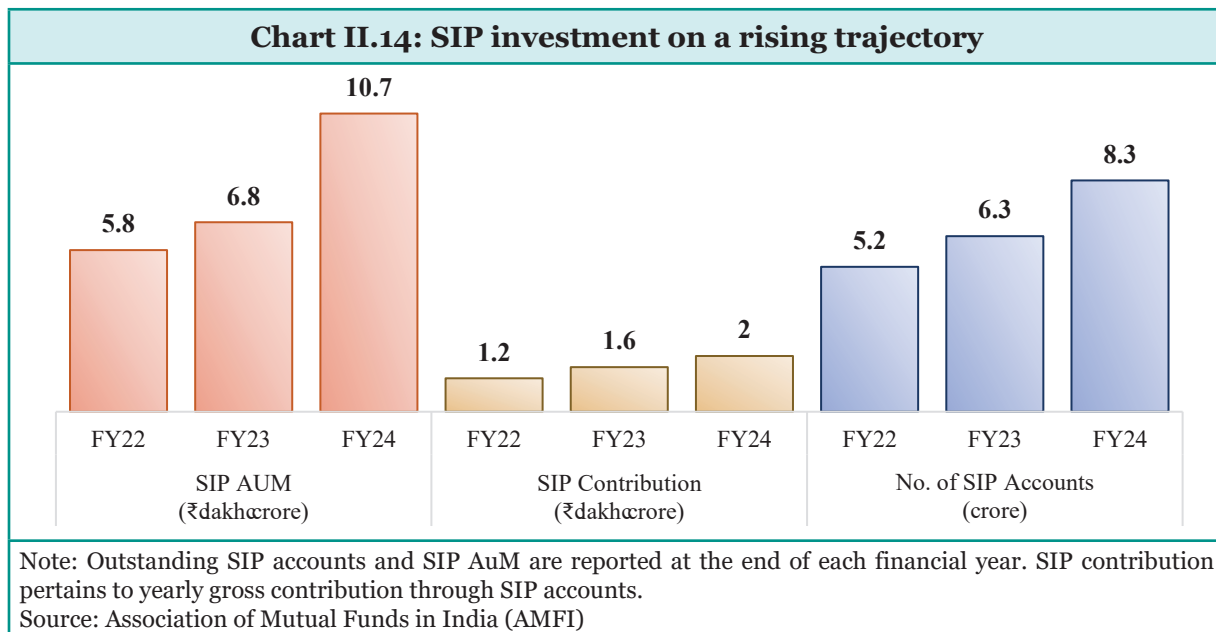
⁵³ LAMA reporting: Failure is not an option, ITRS Blog (2023), <https://www.itrsgroup.com/blog/new-year-operational-risk>

⁵⁴ National Securities Clearing Corporation Limited; Indian Clearing Corporation Limited

⁵⁵ NSE Clearing Archives dated 29 March, 2023, <https://archives.nseindia.com/content/circulars/COM56205.pdf>

inflows into MFs. Among the passive schemes, exchange-traded funds (ETFs) (other than gold exchange-traded funds) witnessed a 37 per cent rise in net assets in FY24.

2.80 The MF segment presently has about 8.4 crore systematic investment plan (SIP) accounts⁵⁶ through which investors regularly invest in schemes. Annual net SIP flows have doubled in the last three years, from ₹0.96 lakh crore in FY21 to ₹2 lakh crore in FY24. Total SIP AuM is approximately 35 per cent of the AuM of the MF industry for equity-oriented schemes. This has pushed up ownership of MFs in Indian equities to 9.2 per cent as of 31 December 2023, compared to 7.7 per cent as of 31 December 2021.



2.81 Some of the factors that facilitated the entry of investors in the pandemic period and beyond included seamless technological integration, Government measures towards financial inclusion, growth of digital infrastructure, rapid smartphone penetration, a rise of low-cost brokerages, the pursuit of generating income from alternative sources and lower returns generated by traditional asset classes such as real estate and gold. However, retail investors have cashed in their gains in financial markets and been investing in real assets. It is smart portfolio diversification. A conducive economic environment in the form of lower interest rates, sustained post-COVID-19 recovery, elevated inflation, and a supportive policy backdrop also boosted the retail accumulation of capital market assets. Further, continuous investor awareness programs focusing on the rights and responsibilities of investors have contributed to the continuing growth of individual participation in securities markets. In August 2023, SEBI introduced the Online Dispute Resolution, which combines online conciliation and online arbitration to resolve disputes arising in the securities market. Another significant measure introduced in FY24 was the centralised mechanism for reporting and verification in case of demise of an investor, thereby smoothening the transmission process to the legal heirs. Enhanced Investor

⁵⁶ A SIP is a systematic approach to investing in mutual funds that involves allocating a small pre-determined amount of money for investment in the market at regular intervals.

Protection Fund⁵⁷ and Settlement Guarantee Fund⁵⁸ and shortening of the settlement cycle have improved the perception of safety and security in the Indian markets. Nonetheless, it is essential to ensure that retail investors do not mistake these funds as mechanisms to underwrite their losses and provide a backstop.

2.82 The number of unique tax IDs registered on the NSE rose from 2.7 crore in FY19 to 9.2 crore in FY24. The enhanced participation of retail investors in the Indian capital market is hugely welcome and lends stability to the capital market. It has also enabled retail investors to earn higher returns on their savings. Most of the new retail investors are likely young and may have a higher risk appetite. It is also reflected in the interest that retail investors have shown in derivatives trading, especially expiration-day trading. While derivatives are hedging instruments, they are mostly used as speculative instruments by investors worldwide. India is likely no exception.

2.83 Derivatives trading holds the potential for outsized gains. Thus, it caters to humans' gambling instincts and can augment income if profitable. These considerations are likely driving active retail participation in derivatives trading. However, globally, derivatives trading loses money for the investors, for the most part. Raising investor awareness and continuous financial education is essential to warn them of the low or negative expected returns from derivatives trading. A significant stock correction could see losses that are more considerable for retail investors participating in capital markets through derivatives. Investors' behavioural response would be to feel 'cheated' by unseen more considerable forces. They may not return to capital markets for a long time. That is a loss to them and the economy.

2.84 The financialisation of economies has not ended well, even for advanced economies. The global financial crisis of 2008 is an obvious example. Developing countries face debilitating crises when financial market 'innovations' and growth run ahead of economic growth. The Asian crisis of 1997-98 set back the high-flying economies of the region for a long time. Therefore, India needs to have an orderly and gradual evolution of the financial market.⁵⁹

2.85 All stakeholders – market participants, market infrastructure institutions, regulators, and the Government must ensure that capital markets play their theoretically assigned role of directing savings to their most productive investments. It is not just in the national interest. It is an act of self-interest, too.

Social Stock Exchanges: Leveraging finance from a social stand-point

2.86 Box II.4 discusses the role of the Social Stock Exchange (SSE) in bridging the financing gap by providing alternative fund-raising instruments for achieving socio-development goals.

⁵⁷ The Investor Protection Fund compensates the investors to the extent of funds found insufficient in the defaulters' account to meet the admitted value of the claim, subject to a maximum limit of ₹25 lakh per investor per defaulter/expelled member in respect of claims arising on expulsion/declaration of default of members.

⁵⁸ The objective of the Settlement Guarantee Fund is to guarantee the settlement of all transactions of the members of the exchange inter-se through the stock exchange.

⁵⁹ For further details, please see: Nageswaran, V. & Natarajan, Gulzar. (2019), 'The Rise of Finance: Causes, Consequences and Cures'. Cambridge University Press.

Box II.4: Social Stock Exchanges in India: Making progress

Indian securities markets, over the years, have been characterised by momentous strides in expanding the retail footprint in finance, innovative fund-raising, and regulatory solid scrutiny of stock exchange platforms. To leverage this transparency and rigour of equity markets for social good, in the Union Budget of FY20, the Government proposed to initiate steps towards creating a SSE under the regulatory ambit of SEBI for listing social enterprises and voluntary organisations working for the realisation of a social welfare objective so that they can raise capital as equity as well as, debt in the country.

Need for Social Stock Exchange: The SSE aims to bridge the financing gap by providing alternative fund-raising instruments for achieving socio-development goals. SSE is a separate segment of the existing stock exchange, which can help social enterprises like non-profit organisations (NPOs) and non-government organisations (NGOs) raise funds from the public through the stock exchange mechanism. In this way, SSE is expected to stimulate the ecosystem of outcome-driven philanthropy in India in a transparent and regulated environment. SSE also offers a platform for constructive engagement of NGOs and other enterprises working in the area of social projects related to health, education, livelihood generation, etc., to directly raise funds from the private sector, corporate entities and individuals (including High Net Worth Individuals (HNIs)) and contribute to development goals. With the increasing global appetite for socially responsible investments, SSE bridges this gap and brings the capital markets closer to the masses for meeting various social welfare objectives.

Operationalisation of SSEs: The contributions towards the social sector projects listed on SSE are made through a unique security, known as Zero Coupon, Zero Principal (ZCZP) instrument as the nature of funding is akin to a donation and, as such, does not promise any payment of coupon or return of the principal amount. To scale up this ecosystem, the Government has recently extended tax exemption under section 80G of the Income Tax Act, 1961, to the contributions made through ZCZPs on SSE. Another noteworthy feature of

SSE is that fund-raising on this platform is tied to specific projects undertaken by eligible NPOs. These NPOs are mandated to declare their year-wise milestones that are targeted to be achieved with funds raised from the public. In this regard, the SEBI (Issue of Capital and Disclosure Requirements (ICDR)) Regulations, 2018 identifies broad activities for which these potential projects can be undertaken, in areas such as eradication of hunger, poverty, malnutrition, and inequality; promotion of healthcare, education, livelihood for rural and urban poor; disaster management; and environmental sustainability, among others.

To be listed on SSE, NGOs/NPOs must disclose their past social audit reports, verifying proven expertise and commitment to executing social sector projects. As eligibility criteria, the regulatory framework requires that the NGOs/NPOs have at least 3 years of field experience in executing social sector projects. Further, to ensure accountability of fund-

raisers to fund-providers, entities raising funds on SSE must disclose detailed information about their social and environmental performance in an Annual Impact Report within 90 days from the end of the financial year, duly audited by a social auditor.⁶⁰ Thus, through its rigour, transparency, and scrutiny, the SSE platform ensures that donations reach credible entities, inspiring confidence in the ecosystem and paving the way for its scalability as we advance.

Progress so far: After the rollout of the regulatory framework for SSE by SEBI, National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) obtained SEBI's in-principal approval to set up a separate segment of SSE. As of April 2024, 51 NPOs are registered on the BSE, and 50 (11 undergoing renewal) are registered on the NSE. Nine NPOs have raised funds on SSE, amounting to a total of ₹ 12.4 crore. These projects span social projects in education, livelihood generation, skill development, etc.⁶¹

Gift IFSC: emerging as a dominant gateway for global capital inflows into india

2.87 The IFSC in GIFT City, Gujarat, is envisaged to be a unique international financial jurisdiction located inside onshore India, set up with a dual objective of onshoring India-centric international financial services business as well as serving as a preferred gateway for channelising global capital flows into and out of the country. Over the last few years, GIFT IFSC has made great strides in achieving both of these objectives. The initiative is a shining example of India's firm commitment to undertake deep, bold and ambitious financial sector reforms to attract the global financial services business and gradually become a global leader in international finance.

2.88 The uniqueness of the IFSC as a distinct financial jurisdiction emanates from three fundamental factors. First, the IFSC has been designated as a non-resident zone under the Foreign Exchange Management Act, which means that entities set up in the IFSC are outside the capital control restrictions and, therefore, can conduct business in any of the eleven notified foreign currencies.⁶² Second, the IFSC has been brought under the regulatory purview of a dedicated and unified financial regulator, i.e. IFSCA (International Financial Services Centres Authority), which has been set up under an Act of Parliament. This regulatory intervention by the Government has significantly bolstered the attractiveness of IFSC among global investors and financial institutions, as they now have to deal with only one Authority for all approvals and licenses. Third, through successive Union Budgets, the Government has provided a separate tax regime for the IFSC, which is at par with what is available in other leading global financial centres. The competitive tax regime has ensured that financial services institutions

⁶⁰ A financial auditor audits financial statements and transactions, keeping in mind the objective of issuing an opinion on the state of financial affairs, whereas a social auditor looks at the impact caused on society by the organisation, covering environmental, social and economic aspects. SEBI defines a social auditor as an individual registered with a self-regulatory Organisation (SRO) under the purview of the Institute of Chartered Accounts of India (ICAI).

⁶¹ As per SEBI

⁶² US Dollar (USD) Euro (EUR) Japanese Yen (JPY) UK Pound Sterling (GBP) Canadian Dollar (CAD) Australian Dollar (AUD) Swiss Franc (CHF) Hong Kong Dollar (HKD) Singapore Dollar (SGD) UAE Dirham (AED) Russian Ruble (RUB)

operating from IFSC are not at a disadvantage. The contribution of GIFT IFSC in transforming the country's financial industry landscape can be better appreciated by looking at some key business activities in GIFT IFSC.

2.89 Banking sector: The Banking ecosystem in GIFT IFSC is rapidly evolving with a healthy mix of foreign and domestic banks, primarily catering to the foreign currency borrowing requirements of Indian corporates and public sector enterprises through external commercial borrowing, trade finance, etc. Transactions under these heads, previously booked from foreign financial centres such as Singapore, Dubai, Hong Kong, etc., are now being booked out of GIFT IFSC. As of March 2024, the total asset size of IFSC Banking Units (IBUs) crossed USD 60 billion, and the cumulative value of transactions undertaken by IBUs crossed USD 795 billion.⁶³

2.90 Funds Industry: The robust funds industry in GIFT IFSC has a transformative impact in catalysing global capital inflows into India, including the start-up ecosystem. In the last three years, there has been rapid growth in Fund Management Entities (FMEs) and AIFs registered with IFSCA. As of March 2024, the cumulative FMEs and funds registered rose from 39 and 33 as of September 2022 to 114 and 120, respectively, as of March 2024. Previously, the pooling of international capital for investments in India was structured through funds (private equity, venture capital, hedge funds, etc.) set up in offshore jurisdictions. Now, with enabling regulations, a competitive tax regime, and beneficial cost of operations, GIFT IFSC is emerging as a preferred jurisdiction for the pooling of global capital by foreign and Indian fund managers.

2.91 Aircraft & ship leasing and financing: The aviation industry in India is on the cusp of unprecedented growth, with a strong order book of more than 1500 + aircrafts placed by Indian airlines and a projected demand for over 2,200 aircrafts by 2042. Currently, most aircraft operated by Indian airlines are leased from offshore lessors that have access to competitive capital costs. The aircraft leasing and financing business, the most profitable segment in the aviation value chain, was entirely residing in foreign jurisdictions. Recognising the immense potential of the aircraft leasing and financing business, IFSCA introduced the enabling leasing framework, and the Government supported the endeavour by providing several tax incentives. In three years, green shoots have been visible in IFSC, with more than 28 aircraft lessors already registered, which have leased more than 120 + aviation assets, including commercial aircraft, helicopters, aircraft engines and ground support equipment. Interestingly, Air India has also commenced leasing its wide-bodies aircraft from the IFSC Zone.

2.92 Considering the critical role of the maritime and shipping industry, the Government and IFSCA have taken significant steps to develop a robust ship leasing and financing ecosystem in GIFT IFSC. The initial focus is to bring back Indian shipping companies who are leasing/owning ships out of foreign jurisdiction. With an enabling regulatory framework, the ship leasing ecosystem is gaining traction. As of 31 March 2024, the number of ship leasing companies registered with IFSCA has risen to 11, underscoring the financial centre's rising appeal for maritime business. Furthermore, these companies have acquired and leased four

⁶³ Data sourced from IFSC GIFT City

assets from GIFT IFSC. Going forward, IFSCA intends to work with IFSC Banking Units (IBUs) to develop a vibrant ship and aircraft financing ecosystem and contribute towards increasing Indian ownership of assets.

2.93 Foreign universities initiative: The IFSC, being an offshore jurisdiction, is also uniquely positioned to become an ‘international higher education hub’ by attracting top-quality global universities keenly exploring India due to its talent and demographic profile. This opportunity was outlined in the Union Budget FY23, wherein it was stated that ‘*World Class Foreign Universities and Institutions will be allowed in the GIFT City to offer courses in Financial Management, Fintech, Science, Technology, Engineering and Mathematics, free from domestic regulations, except those by the IFSCA to facilitate the availability of high-end human resources for financial services and technology*’. In this endeavour, IFSCA achieved a significant milestone in FY24 when Deakin University from Australia became the first foreign university to be granted final registration for their International Branch Campus in GIFT IFSC under IFSCA (Setting up and operation of International Branch Campus and Offshore Education Centre) Regulation, 2022. Additionally, the University of Wollongong from Australia became the second foreign university to receive in-principal approval for their International Branch Campus in GIFT IFSC. The entry of two foreign universities in GIFT IFSC has paved the way for other globally reputed universities to look at this opportunity and contribute to the rise of an educated and skilled India.

2.94 There are several ongoing reforms to establish IFSC as a reputed international financial centre towards achieving the dual mandate of development and regulation of financial services. IFSCA is in the process of implementing robust regulatory and supervisory systems backed by best-in-class technology. The announcements made in the Union Budget FY24, such as a single window IT system for registrations and delegating powers under the SEZ Act to IFSCA to avoid dual regulations, will enhance the ease of doing business. The IFSC is expected to emerge as a preferred gateway for global capital flows into and out of the country.

Developments in the insurance sector

Moderation in global insurance markets

2.95 Global economic slowdown and inflation have raised challenges for insurers. The cost of capital is rising with more robust investment returns. Reserve adequacy has emerged as a critical consideration as a prolonged period of favourable development wanes due to the current and recent shocks of high inflation and the COVID-19 pandemic. Despite having a large buffer, the pace of industry reserve releases has slowed. In the existing environment, many uncertainties prevail, such as delayed settlements, which emerge as a more significant problem in periods of high economic and social inflation. The shift of inflation from goods to services has impacted liability exposures. In the future, lower claims once disinflation sets in and higher returns on interest rate-sensitive investments are expected to support profitability.

2.96 Considering the abovementioned factors, global insurance markets have witnessed a contraction in 2022 compared to the previous year. As per the Swiss Re Institute report on World Insurance 2023⁶⁴, total global insurance premiums contracted by 1.1 per cent in real terms in 2022, compared to a growth of 3.4 per cent in 2021. However, the non-life insurance sector witnessed an increase of 0.5 per cent in 2022, though lower than the 2.6 per cent growth registered in 2021, driven by rate hardening in commercial lines in developed markets. In the life insurance segment, global premiums contracted by 3.1 per cent in 2022, compared to a growth of 4.5 per cent in 2021.

India is poised to emerge as one of the fastest-growing insurance markets in the coming decade

2.97 Economic growth, an expanding middle class, innovation, and regulatory support have driven insurance market growth in India. In FY23, premium growth moderated slightly compared to the previous year, reflecting still-in-process adjustments to the post-COVID-19 era. Overall insurance penetration⁶⁵ in India moderated slightly to 4 per cent in FY23, from 4.2 per cent in FY22. During the same period, insurance penetration in the life-insurance segment declined from 3.2 per cent in FY22 to 3 per cent in FY23, while it remained flat at 1 per cent for the non-life insurance segment. Overall insurance density⁶⁶ increased from USD 91 in FY22 to USD 92 in FY23. In the life insurance segment, it rose from USD 69 in FY22 to USD 70 in FY23 and remained stable in the non-life insurance segment.⁶⁷

2.98 As per the Swiss Re Institute Report,⁶⁸ Life premium growth in India is estimated to slow to 4.1 per cent in FY23 (higher than the historical average of 3.2 per cent during 2012-2021) from 5.9 per cent in FY22 as memories (i.e., risk awareness) of the pandemic faded and a recent change in tax norms for high-ticket policies⁶⁹ weighed on new premium growth. Owing to these factors, new business premiums, after growing by 40 per cent in the first quarter of FY22, contracted in the fourth quarter (7 per cent). The momentum continued in FY23 as well, with new business premiums in the second quarter declining by 21.2 per cent, mainly due to a contraction in the group insurance business.

Status of Non-Life Insurance segment

2.99 Non-life premium growth moderated slightly from 9 per cent in FY22 to an estimated 7.7 per cent in FY23 (lower than the historical average of 8 per cent during 2012-2021) as the market stabilised after the pandemic. Growth in almost all lines of business slowed last year

64 Swiss Re Institute Report, World Insurance Market 2023, <https://t.ly/64ENQ>

65 Insurance penetration refers to the ratio of the insurance premiums written in a particular year to GDP

66 Insurance density refers to the ratio of insurance premium to population, i.e., insurance premium per capita and is measured in US Dollar.

67 Swiss Re Institute Report, 'India's Insurance Market: Growing Fast with Ample Scope to Build Resilience', <https://t.ly/tagPh>

68 Ibid

69 Under this regulation, any proceeds from a life insurance policy with an annual premium exceeding ₹5 lakh are subject to taxation. As a result, section 10(10) of the Income Tax Act, previously offering exemptions, no longer applies to policies with premiums surpassing this threshold.

as the industry stabilised after the pandemic. The sector faces headwinds such as economic slowdown, high interest rates, and elevated retail and medical inflation.

2.100 Health accounts for around 35 per cent of sector premiums written in FY23. With an estimated increase of 11 per cent in premiums, health saw the fastest growth amongst all non-life lines in FY23. Increased health awareness, supportive government policies, rising medical costs and innovations in Insurtech have supported this growth. Although price and income constraints may limit demand for the lower income groups, the expanding middle class and increased discretionary spending are expected to support overall growth. Further, to provide health insurance to low-income households, Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY) and State government extension schemes are in place. Recently, AB-PMJAY achieved a milestone of generating 34.2 crore Ayushman cards across India, with 49.3 per cent of them held by females. In the medium term, health premiums are projected to grow by 9.7 per cent annually in 2024-28, with regulatory initiatives to improve the attractiveness of insurance offering some support.

2.101 Agriculture insurance is another line of business, accounting for around 12 per cent of the non-life insurance market. The agriculture insurance is estimated to register a flat growth in FY23 due to a sharp decline in premium rates in the Kharif cropping season. The decline was more than offset by increased insured land area and farmer enrolments during the season. Agriculture premiums will likely rise from 2024 onwards, with an average real premium growth of 2.5 per cent over the medium term, supported by improvements in insurance infrastructure such as mobile applications and remote sensing for crop loss monitoring. The Government has launched various initiatives to address current concerns around crop insurance. These include the launch of new technological initiatives such as the YES-Tech Manual, WINDS portal, and enrolment app AIDE/Sahayak to assess crop damage via satellite-based advanced technologies, and with door-to-door enrolment initiatives making cover more accessible.

2.102 The Government and Insurance Regulatory and Development Authority of India (IRDAI) have taken several steps to support industry growth. Paramount among these is the mission “Insurance for all by 2047”, launched in November 2022, to ensure that every citizen and enterprise has appropriate insurance cover/solution. Three major initiatives, Bima Sugam,⁷⁰ Bima Vahak,⁷¹ and Bima Vistaar⁷² are expected to be launched, aiming to raise insurance penetration, particularly in semi-urban areas, rural towns, and villages.

2.103 The IRDAI approved amendments to the reinsurance regulations to position India as a global reinsurance hub. Fundamental changes include reducing Foreign Reinsurance Branches’ (FRB) minimum capital requirement to USD 6.1 million from USD 12.2 million and streamlining the regulator’s order of preference of cession by Indian insurers to reinsurers to

⁷⁰ “Bima Sugam” is an online portal to facilitate the buying of insurance, portability facilities, the ability to change insurance agents and the settling of life, motor and health claims directly with insurers

⁷¹ “Bima Vahak” is a women-centric insurance distribution channel

⁷² “Bima Vistaar” is a social safety net accessible to all through the Bima Sugam platform

four from six levels. Reinsurance formats have been simplified, and the International Financial Service Centre Insurance Offices' (IIOs) framework has been aligned with that of the IFSCA rules for better competitiveness.

2.104 A comprehensive regulatory review has been undertaken, transitioning from a rule-based approach to a principle-based architecture while establishing a resilient and robust risk management framework. Streamlining the operations, 167 circulars and 82 returns have been repealed, while 78 regulations have been amended, consolidated, and reduced to 28. The regulatory clearance processes for insurance products have also been replaced from the erstwhile requirement of prior approval under the '*File and Use*' regime, with all the products under the general and health insurance and the majority of the life insurance products being required to follow '*Use and File*' procedures which facilitate insurers to launch the products quickly considering the market dynamics.

2.105 Various regulatory stipulations have also been removed for product offerings under all the segments, focusing on the health insurance segment to provide enhanced coverage and choice to customers. Further, to empower policyholders with a deeper understanding of their insurance coverage, issuance of a concise *Customer Information Sheet* (CIS) to the policyholders has been made compulsory for all types of insurance policies.

2.106 Further, to make the industry future-ready and align with global standards, significant progress has been made towards the implementation of the Risk-Based Supervisory Framework, Risk-Based Capital Framework, and International Financial Reporting Standards. The IRDAI facilitates coordinated efforts between insurers and state governments through state insurance plans to take insurance services to the last mile and even the remotest parts of the country.

2.107 These reforms and sustained economic growth are expected to facilitate the continued development and advancement of the insurance sector supported by robust economic growth, an expanding middle class, innovation, and strong policy support. There are favourable projections for the Indian Insurance market. The Swiss-Re Institute January 2024 report⁷³ projected that over the next five years (2024-28), total insurance premiums in India will grow by 7.1 per cent in real terms, well above the global (2.4 per cent), emerging economies (5.1 per cent) and advanced economies (1.7 per cent) market averages. At this rate, India will have the fastest-growing insurance sector amongst the G20 countries. Insurance penetration as a per cent of GDP is projected to grow from 3.8 per cent in FY23 to 4.3 per cent by FY35. The growth in life business (premiums up 6.7 per cent in 2024-28) is likely to be supported by rising demand for term life cover by the middle class, the country's young population and increasing industry adoption of Insurtech. Non-life premiums are projected to grow at an annual average of 8.3 per cent during 2024-28, driven by economic growth, improvement in distribution channels, government support and a favourable regulatory environment. Further, over the next

⁷³ <https://tinyurl.com/mryvwj9m>

decade (2024-34), total premiums are expected to more than double (inflation-adjusted), and insurance penetration will increase from 3.8 per cent presently to 4.5 per cent in 2034.

2.108 For the anticipated rise in insurance penetration to materialise, the industry has to become more customer-friendly. According to the Annual Report of IRDAI for FY23⁷⁴, the centralised grievance portal received over two lakhs of complaints during the year. If the Life Insurance Corporation of India is excluded, over 50 per cent of the complaints against life insurers were about unfair business practices, a euphemism for mis-selling. Further, 66 per cent of the complaints against general insurers were about claims, including delayed and denied settlements. The industry has to think and work for the long term. Insurance penetration will not rise. Data for FY23 showed a decline in insurance penetration. When it comes to financial products, globally, ‘soft-touch’ regulations have seldom worked over a sustained period in delivering customer satisfaction and value for money.⁷⁵ Globally, the private financial sector has repeatedly shown itself to be adept at selective or misinterpretation of principles-based regulations to its benefit.

Developments in the pension sector

2.109 The demographic structure of most countries is changing significantly as birth rates continue to fall. This development has significant consequences for pay-as-you-go pension arrangements, which rely on the next generation of taxpayers to fund the pensions paid to previous generations. In the recent past, the re-emergence of inflation has also damaged the community’s confidence in the ability of pension programs to deliver adequate retirement benefits over the longer term. Although inflation has declined in some economies, its persistence has highlighted this risk to current and future retirees. At the same time, there is an ongoing global shift away from defined benefit (DB) to defined contribution (DC) arrangements, in which individuals carry all risks relating to investment returns, inflation and, often, longevity. Very few systems have solved the dilemma of moving from an individual-based DC accumulation system to a post-retirement system that provides adequate and secure income to retirees while providing them the same flexibility available during their working years.

2.110 An ongoing challenge facing many pension systems is the inclusion of gig workers and those in the informal labour market. In many economies, the labour market is fracturing; therefore, the stable or structured employer-employee relationship is disappearing. In such circumstances, pension arrangements must become more individually focused and less reliant on third parties.⁷⁶

⁷⁴ <https://tinyurl.com/98vs72dc>

⁷⁵ ‘Insurance industry needs a regulatory shake-up’, Business Line, 10th February 2024 (<https://www.thehindubusinessline.com/opinion/insurance-industry-needs-a-regulatory-shake-up/article67829954.ece>)

⁷⁶ International Labour Organisation, ‘Non-Standard Employment Around the World: Understanding challenges, shaping prospects’, <https://tinyurl.com/3uah4a4n>

Performance of India's Pension Sector

2.111 According to the 15th Annual Mercer CFA Institute Global Pension Index (MCGPI)⁷⁷, India's overall global pension index value improved from 44.5 in 2022 to 45.9 in 2023, primarily due to an improvement in adequacy and sustainability sub-indices. India's pension system comprises an earnings-related employee pension scheme, a defined contribution Employee Provident Fund (EPF) and supplementary employer-managed pension schemes that are essentially by way of DC. Changes in workforce dynamics, employment, and family patterns have brought formal sources of retirement to the forefront. While there is improvement in the net pension replacement rate and participation in private pension plans, which is reflected in the value of adequacy and sustainability sub-indices, the coverage of the Indian workforce under private pension plans is yet to be enhanced.⁷⁸ The Government has launched various schemes as part of the universal social security programme to benefit the unorganised sector.

2.112 India's pension sector has expanded since the introduction of the National Pension Scheme (NPS) and, more recently, the Atal Pension Yojana (APY). The total number of subscribers stood at 735.6 lakh as of March 2024, registering a YoY growth of 18 per cent from 623.6 lakh as of March 2023. The total number of APY subscribers (including its earlier version, NPS Lite) increased from 501.2 lakh as of March 2023 to 588.4 lakh as of March 2024. APY subscribers account for around 80 per cent of the pension subscriber base.⁷⁹

2.113 Disaggregated data of the Pension Fund Regulatory and Development Authority of India (PFRDA) shows that APY subscribers have witnessed an improvement in gender mix, with female subscriber share rising from 37.2 per cent in FY17 to 48.5 per cent in FY23. The age mix is increasing also in favour of the younger cohort in the age group of 18-25, from a share of 35 per cent in FY17 to 46.7 per cent in FY23. However, the bulks, about 92 per cent, of APY accounts are for a pension amount of ₹1,000 per month, followed by 4.7 per cent for ₹5,000. The overwhelming share of ₹1,000 pension in APY could be due to several factors, the predominant cause being that the target population is low-income households where day-to-day consumption expenditure takes precedence over savings.⁸⁰

2.114 The population's pension coverage under these two schemes (NPS & APY) as a share of the total population has increased from 1.2 per cent in FY17 to 5.3 per cent in FY24. AuM under these schemes as a proportion of GDP has risen from 1.1 per cent in FY17 to 4 per cent in FY24.

Outlook for the Pension Sector

2.115 In the future, NPS (private sector) is poised to expand rapidly as an increasing number of corporate employees and relatively better-off households, for example, self-employed and

⁷⁷ The Mercer CFA Institute Global Pension Index benchmarks 47 retirement income systems around the world, highlighting challenges and opportunities within each. The index is made up of three sub-indices, adequacy, sustainability, and integrity that measure each retirement income system against more than 50 indicators

⁷⁸ Presently, 6 per cent of the Indian workforce is covered under private pension plans, as per the 15th Annual MCGPI.

⁷⁹ <https://www.pfrda.org.in/>

⁸⁰ Monthly Pension Bulletins of PFRDA, <https://www.pfrda.org.in>

professionals such as doctors, lawyers, and small business owners, see the merit of joining NPS. There is a potential for NPS in rural areas for larger farmers, traders, and those with lumpy incomes, as it does not require a standard monthly contribution.

2.116 There is a tremendous scope for growth as India's per capita income rises further and transitions to a high-middle-income country. India's demographic structure, with a more significant proportion of younger people, favours a phase of accumulation. Since life expectancy is inching up, the need for a steady income stream is also increasing to mitigate old-age poverty. Further, as the traditional family support system changes with growing urbanisation, there is even a greater necessity for an independent source of income in old age.

2.117 Financial literacy becomes essential for people to reap the benefits of the formal financial sector. There are many facets to pension literacy; women in the family must have a pension account given their higher longevity; it is prudent to empower young adults, particularly students, with a pension account so that they imbibe the financial discipline of long-term saving.

2.118 Financial inclusion and empowerment will only be complete with each family member's pension account. In this direction, given the nature of the pension product where the payoff is not immediate, it needs a nudge by all concerned, the employers, intermediaries, the Government, and the pension regulator, to induce people, particularly young adults, to join a pension scheme. There is immense merit in joining young as, with small contributions, a sizeable corpus could be accumulated given the power of compounding, providing substantial steady income in one's post-working life.

Mechanisms to ensure regulatory coordination and overall financial stability

2.119 The financial system's stability is paramount for sustainable economic growth and prosperity. A financially stable system should be robust to macroeconomic disturbances. It should withstand unforeseen shocks so that there is a high degree of confidence that it will continue to meet its contractual obligations. Financial stability means not only an absence of actual crisis but also the ability of the system to limit and manage imbalances before they assume a magnitude that threatens itself or the economic processes.

2.120 The role of the Government in ensuring financial stability is multifaceted and crucial. Governments worldwide employ various policies, regulations, and measures to safeguard the integrity and smooth functioning of the financial sector. It would also be essential to assess how financial instability interacts with the real economy to either amplify or moderate the effects of initial shocks. Thus, regulators responsible for oversight of different financial institutions must interact and cooperate closely among themselves and with those responsible for the stability of prices and the real economy.

2.121 In the Indian context, the Financial Sector Development Council (FSDC)⁸¹ is a forum that facilitates interaction among various financial sector regulators. It is mandated to deal with a wide range of issues relating to financial stability, financial sector development, inter-regulatory coordination, financial literacy and financial inclusion, macro-prudential supervision of the economy, including the functioning of large financial conglomerates, coordinating India's international interface with financial sector bodies (like Financial Action Task Force (FATF), Financial Stability Board (FSB)) and any other matter relating to the financial sector stability and development referred by a Member/Chairperson and considered prudent by the Council.

2.122 Under the FSDC, the FSDC sub-committee (FSDC-SC) is a forum chaired by the RBI Governor which deliberate on agenda items proposed by any of the members along with supportive actions required. Further, the RBI promotes the financial sector's resilience by regulating financial institutions, monitoring systemic risks, and implementing monetary policy. The collective assessment of the risks to financial stability and the strength of the Indian financial system is undertaken and reported in the bi-annual Financial Stability Report (FSR) published by RBI since March 2010.⁸²

Financial Sector Assessment Program (FSAP) for India

2.123 FSAP is the quinquennial exercise jointly conducted by the IMF and the World Bank in countries having 'systemically important' financial sectors. FSAP involves a comprehensive and in-depth analysis of a country's financial industry to assess financial stability and financial sector development. India underwent its first FSAP exercise in 2011-12 and the second one in 2017, after which IMF-World Bank published its reports, including the Financial System Stability Assessment Report (FSSA) and Financial Sector Assessment (FSA) report. The third FSAP exercise for India is underway for 2023-24. The FSSA and FSA reports will be published by February 2025. FSB publishes its annual report on the Implementation and effects of the G20 financial regulatory reforms, mentioning implementation status across various jurisdictions. The colour-coded template in the report⁸³ highlights the extent of sectoral implementation of FSB Principles and Standards. The monitored priority areas include (i) Basel-III reforms, (ii) Compensation, (iii) Over-the-Counter (OTC) derivatives, (iv) Resolution, and (v) Non-Banking Financial Intermediation (NBFI).

2.124 Implementation of Basel III Reforms⁸⁴ has supported resiliency in both the domestic and global banking sectors. Under Basel III pillars reforms, India is largely compliant as it has laid down provisions for Net Stable Funding Ratio, liquidity coverage ratio, requirements for

81 The Minister of Finance chairs the FSDC. Members are MoS (Finance), heads of all other financial sector regulatory bodies (e.g., RBI, SEBI, IRDAI, PFRDA, IFSCA), Secretaries of the departments of (i) Economic Affairs, (ii) Expenditure, (iii) Financial Services, (iv) Revenue, (v) Ministry of Corporate Affairs and (vi) Ministry of Electronics and Information Technology and the Chief Economic Adviser to the Ministry of Finance. The Financial Stability and Cyber Security Division of the Department of Economic Affairs, Ministry of Finance serves as the Secretariat of the Council, and the Division Head of the Division is the Member Secretary of the Council

82 RBI Financial Stability Report June 2024,

83 2023 Financial Stability Board (FSB) Annual Report, 11 October 2023, 'Promoting Global Financial Stability', <https://www.fsb.org/wp-content/uploads/P111023.pdf>

84 FSB classifies implementation under three heads where a jurisdiction has published and implemented final rule, has published rule but not implemented and has not published draft regulation.

Systematically Important Banks, and supervisory framework for measuring and controlling bank's large exposures in line with international standards. India is also in the process of implementing the other two requirements under Basel III, that is, revised leverage ratio requirements and risk-based capital framework.

2.125 For the compensation pillar, India already has in place Standards for Sound Compensation Practices (Principles and Standards) for significant banks, insurers, and asset managers in India.

2.126 Under the OTC derivatives segment, India made significant progress in 2023 from the 2022 FSB assessment, as more than 90 per cent of the OTC derivatives now follow trade reporting, central clearing and platform trading requirements under FSB principles. The fourth parameter under the OTC pillar, that is, margin requirements concerning OTC derivatives, is currently under implementation.

2.127 Enhancing the resilience of NBFIs is an important priority of FSB, which under key reforms area is bucketed under Money Market Mutual Funds, Securitisation and Securities Financing Transactions (SFT) requirements. India is the only jurisdiction among 24 reported by FSB in total compliance with SFT requirements including minimum regulatory standards for collateral valuation and management, numerical haircut floors on bank-to-non-bank transactions, etc. India has actively undertaken securitisation and MMFs reforms in line with FSB principles.

Financial System Stress Indicator

2.128 The RBI, in the 26th issue of its FSR⁸⁵, attempted to compile a comprehensive indicator called the financial system stress indicator (FSSI)⁸⁶ to monitor the aggregate stress level in the Indian financial system. FSSI aims to (a) help identify periods of stress, (b) assess the intensity and duration of stress in the financial system, and (c) gauge the ability of financial markets and intermediaries to withstand shocks and imbalances.

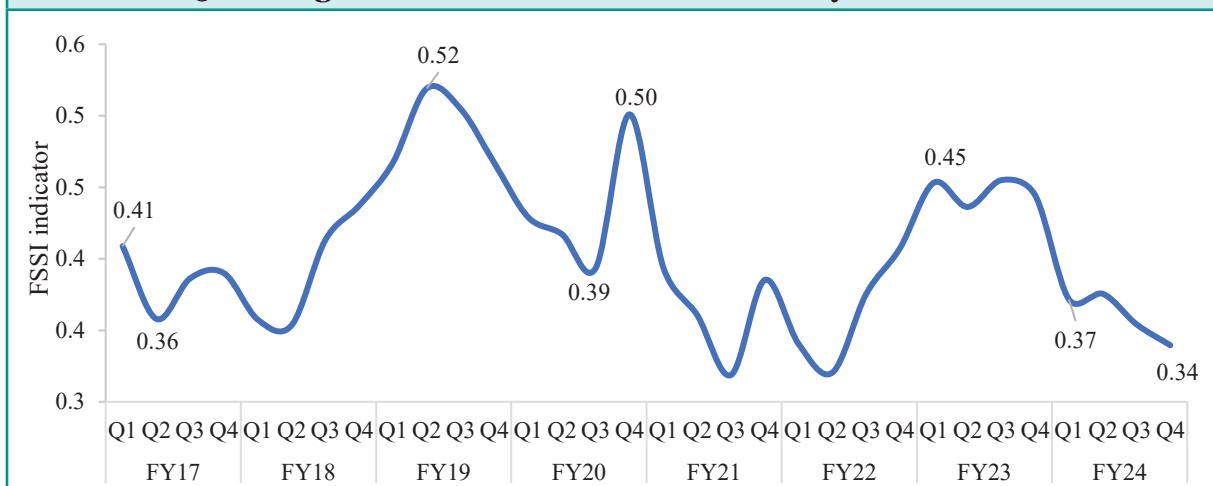
2.129 The latest FSR of June 2024 shows that FSSI indicated a gradual easing of stress during H2 of FY24. The decline in stress indicators has been broad-based, except for the NBFC and money market segments. The decline in government debt market stress was the primary contributor to the improvement in the overall FSSI, aided by a fall in long-term yields as well as volatility and higher net foreign portfolio debt inflows. Meanwhile, declining volatility and rangebound movement in the exchange rate reduced stress levels in the foreign exchange market. Money market stress indicators inched up as tight liquidity in the banking system led to higher interest rates on money market instruments (e.g., Commercial Papers and Certificate of Deposits). The banking system stress indicator remained subdued, supported by improving soundness. The real

⁸⁵ 26th issue of the RBI Financial Stability Report, December 2022, page 56, https://t.ly/o_CZb.

⁸⁶ The FSSI features risk factors about five financial market segments—equity, foreign exchange, money, government debt and corporate debt markets and three groups of financial intermediary segments, namely, banks, NBFCs and AMC-MFs. It also features a real sector component encompassing select real sector variables that have a bearing on financial stability due to their strong interlinkages with the financial sector. For more details, refer: https://rbi.org.in/scripts/BS_PressReleaseDisplay.aspx?prid=57005

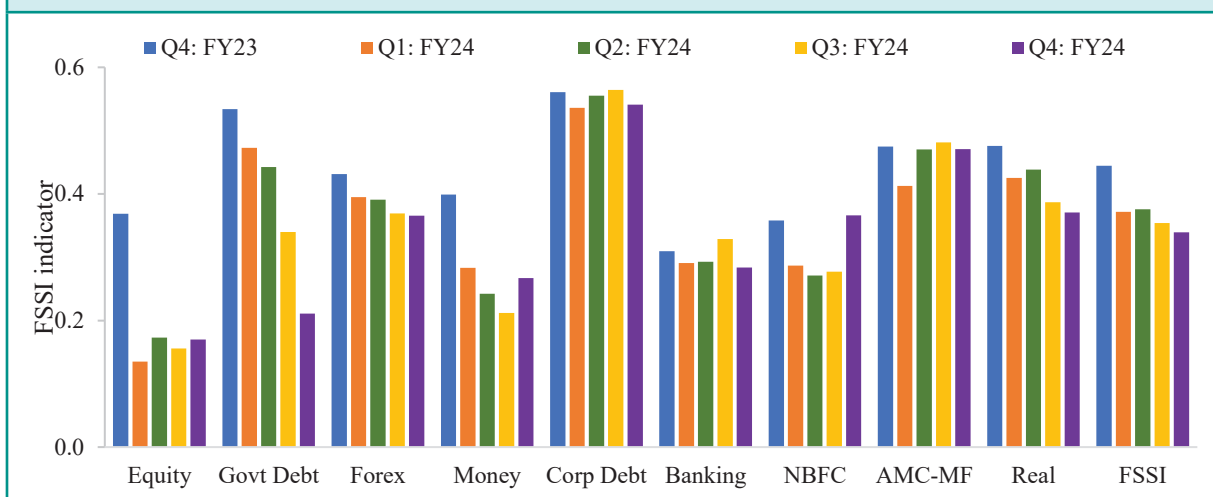
sector stress indicator moderated further on the back of sound macroeconomic fundamentals. Stress indicators for the NBFC sector rose as their capital ratios dipped and spreads on their borrowing costs increased.

Chart II.15: Easing of stress in the Indian financial system reflected in FSSI



Source: Chapter I: Macrofinancial Risks, RBI Financial Stability Report, June 2024

Chart II.16: Broad-based decline in stress levels across financial sectors



Source: Chapter I: Macrofinancial Risks, RBI Financial Stability Report, June 2024

ASSESSMENT AND OUTLOOK

2.130 On most counts, India's financial industry has progressed over time. Domestic credit to the private sector as a per cent of GDP rose from 50.6 per cent in 2010 to 54.7 per cent in 2021. Gross and Net NPAs of SCBs have been declining over time, accompanied by an improvement in CRAR, RoA and RoE. Despite heightened geopolitical uncertainty, India's stock markets have been stable.

2.131 Even as banks, non-banks and corporates battled balance-sheet excesses, the consequences of the credit boom of the first decade of the new millennium and the inevitable bust that followed in the second decade, the broad industry kept advancing the cause of financial inclusion and financial deepening. As India embarks on the vision to become a developed country by 2047, it is imperative that financial intermediation costs decline globally. India has made significant strides in this regard, which may be one reason for its resilient post-Covid economic recovery. However, much work could be done to make it a global financial leader.

2.132 The outlook for India's financial sector appears bright. The vision of Viksit Bharat by 2047 is indeed an opportunity for a prosperous society, robust financial services sector, strong public finances, and economic sovereignty. The elements of a robust financial services sector include a highly competitive and viable banking sector, universal access to banking and other financial services for all citizens, lowest intermediation costs, efficient and quick access to credit and equity funding for small businesses, highly liquid, efficient, and well-regulated stock, bond, and commodity markets. India's financial sector needs to support capital formation and promote trade, business, and investments in MSMEs, enabling them to scale. It also needs to provide insurance protection and retirement security to all citizens. The share of insurance and pension fund assets in GDP stands at 19 per cent and 5 per cent, respectively, in India, compared to a high of 52 per cent and 122 per cent in the USA and 112 per cent and 80 per cent in the UK, leaving scope for further improvements.

2.133 The next big step in the coming years is likely to be towards Artificial Intelligence/ Machine Learning (AI/ML), Decentralised Finance, Internet of Things (IoT), etc., which have a vast potential to disrupt the digital payments ecosystem. Further, the vision is for India to evolve as a 'fintech nation' with the highest number of fintech firms and the highest fintech adoption rate by incumbents fuelled by digital public infrastructure. An approach should be evolved for common user data, e.g. KYC, across Regulators. In the medium term, efforts should be made to move towards data-based lending instead of judgment-based lending, especially for small businesses. In this regard, there is a need for continuous review to identify regulatory gaps/overlaps and benchmark them with the best global practices. Financial sector firms – public or privately owned – must become customer-centric. Without that, most quantitative metrics will remain elusive.

2.134 The Indian financial sector is at a turnpike moment. The dominance of banking support to credit is being reduced, and the role of capital markets is rising. For a country that aspires to be a developed nation by 2047, this is a long-awaited and welcome development. Being reliant on and exposed to the capital market, however, comes with its challenges and trade-offs. As India's financial sector undergoes this critical transformation, it must also brace for likely vulnerabilities and prepare itself with regulatory and government policy levers to intervene and hedge, as required.

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PRICES AND INFLATION: UNDER CONTROL

The pandemic and subsequent geo-political tensions presented considerable challenges to the global economy in inflation management. The supply disruptions inflicted by the pandemic and increased commodity prices caused by heightened global conflicts markedly affected India. As a result, FY22 and FY23 witnessed price pressures in core consumer goods and services. Food prices were affected by adverse weather conditions in the last two years. The net impact of these developments was elevated inflationary pressures in FY23 and FY24. Prudent monetary policy response and calibrated trade policy measures by the Government, coupled with strong output growth, helped reduce core inflation to a four-year low in FY24. Appropriate administrative actions, including dynamic stock management, open market operations, subsidised provision of essential food items and trade policy measures, helped mitigate food inflation to a great extent. The expectation of a normal monsoon and moderating global prices of key imported items give credence to the benign and range-bound inflation projections for India made by the Reserve Bank of India and the International Monetary Fund. Beyond this, the medium to long-term inflation outlook will be shaped by the strengthening of price monitoring mechanisms and market intelligence as well as focussed efforts to increase the domestic production of essential food items like pulses and edible oils for which India has a great degree of import dependence.

INTRODUCTION

3.1 Low and stable inflation is key to sustaining economic growth. Governments and Central Banks face the challenge of keeping inflation at a moderate level while ensuring financial stability. Achieving this delicate balance requires careful monitoring of economic indicators and taking appropriate and timely corrective actions. With the commitment of the Reserve Bank of India (RBI) to the goal of price stability and policy actions by the Central Government, India successfully managed to keep retail inflation at 5.4 per cent in FY24, the lowest level since the Covid-19 pandemic period ('pandemic' hereinafter).

3.2. After the pandemic, the global economy experienced another set of supply chain disruptions beginning with the Russia-Ukraine war in the first half of FY23. In the latter half of the year and FY24, there was a decline in global inflation because of the diminishing impact of price shocks, particularly in energy prices, as well as lower core inflation and monetary tightening. According to the International Monetary Fund¹, the coordinated monetary tightening by Central Banks in

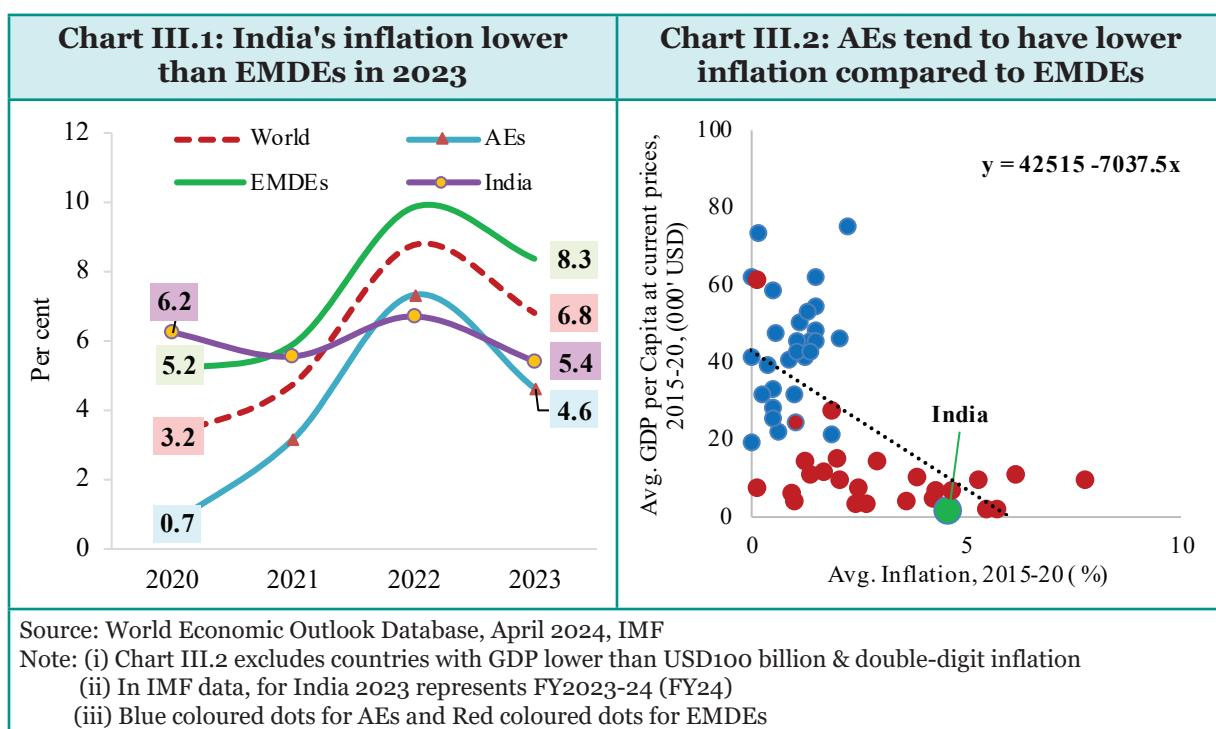
¹ World Economic Outlook, April 2024: Steady but Slow: Resilience amid Divergence, pages 3-4. <https://tinyurl.com/38pederj>

major advanced economies during 2022-23 significantly contributed to the decline in energy prices due to its high level of synchronisation and the resulting impact on reducing global energy demand.

India's retail inflation is lower than the EMDEs and world average

3.3. Despite the synchronous tightening of monetary policy by most central banks to restore price stability, the global economy has shown unexpected resilience in 2023. This is evident in both advanced economies (AEs), and emerging markets & developing economies (EMDEs), as they are returning to their inflation targets. This trend is also observed in India. As per the IMF² data, where India's inflation rate was lower than the global average and that of EMDEs in 2022 and 2023.

3.4. There is a clear negative relationship between cross-country inflation and per capita GDP. Historically, inflation in advanced economies has generally been lower than in EMDEs. Factors such as established monetary policies, economic stability, well-developed and efficient markets that balance supply and demand conditions, and stable currencies contribute to the effective management of inflation (Ha, Kose & Ohnsorge, 2018)³.



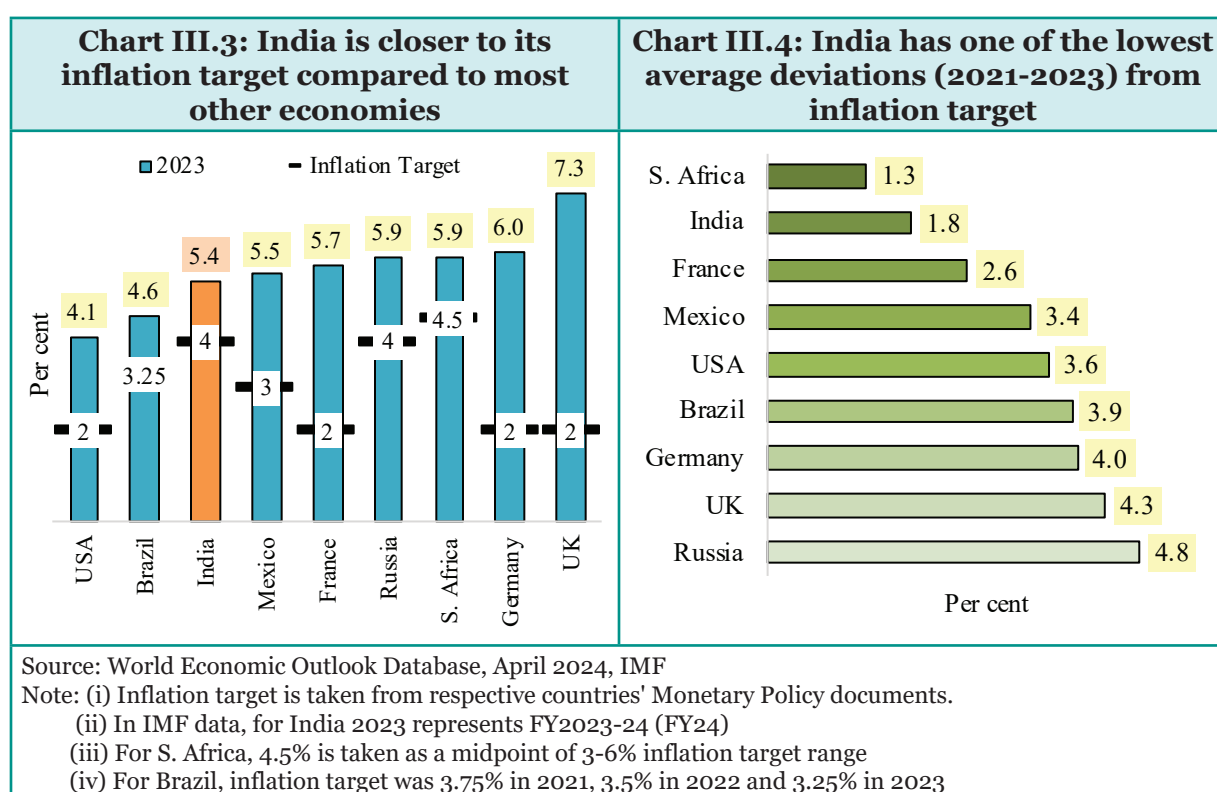
India's inflation management was relatively better to keep it within the target

3.5. With the goal of maintaining price stability, many countries have established their own inflation targets based on various factors that serve their economic objectives best. Factors such as the level of economic development, the structure of the economy, the state of the financial

2 World Economic Outlook, April 2024: Steady but Slow: Resilience amid Divergence, page 145
 3 Ha, Jongrim; Kose, Ayhan; Ohnsorge, Franziska Lieselotte (2018). Inflation in Emerging and Developing Economies: Evolution, Drivers, and Policies. World Bank Group, Washington, D.C. <https://tinyurl.com/yf2zzx95s>

system, and the trade-off between inflation and other economic objectives may influence these targets (Jahan, Sarwat)⁴. In pursuit of specific inflation targets set by countries, they employ various policies and measures. Interestingly, India is performing better than various developed and emerging economies in relation to its inflation target.

3.6. In 2023, India's inflation rate was within its target range of 2 to 6 per cent. Compared to advanced economies like the USA, Germany, and France, India had one of the lowest deviations from its inflation target in the triennial average inflation from 2021-2023. Despite the challenges posed by global demand-supply imbalances due to ongoing geopolitical tensions, India's inflation rate was 1.4 percentage points below the global average in 2023. Against this background, the survey discusses trends and drivers of retail inflation and its constituents – headline, core, and food inflation, state-wise variations in retail inflation, rural-urban inflation differential and fiscal policy measures undertaken to contain inflation as the chapter proceeds.



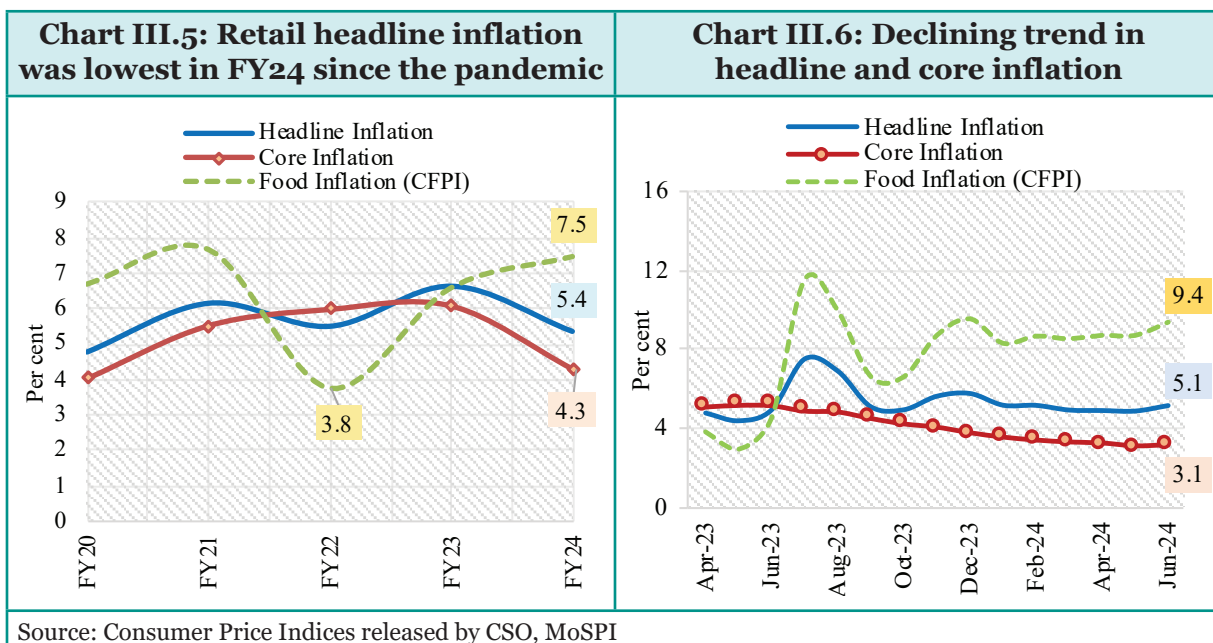
DOMESTIC RETAIL INFLATION

Retail inflation moderated gradually in FY24

3.7. Since 2020, countries have been facing challenges in controlling inflation. In FY23, Consumer Price Index (CPI) based retail inflation in India was primarily influenced by higher food inflation, while core inflation remained moderate. Externally, the Russia-Ukraine war led to price pressures, while domestically, excessive heat in the summer and uneven rainfall put pressure on food prices.

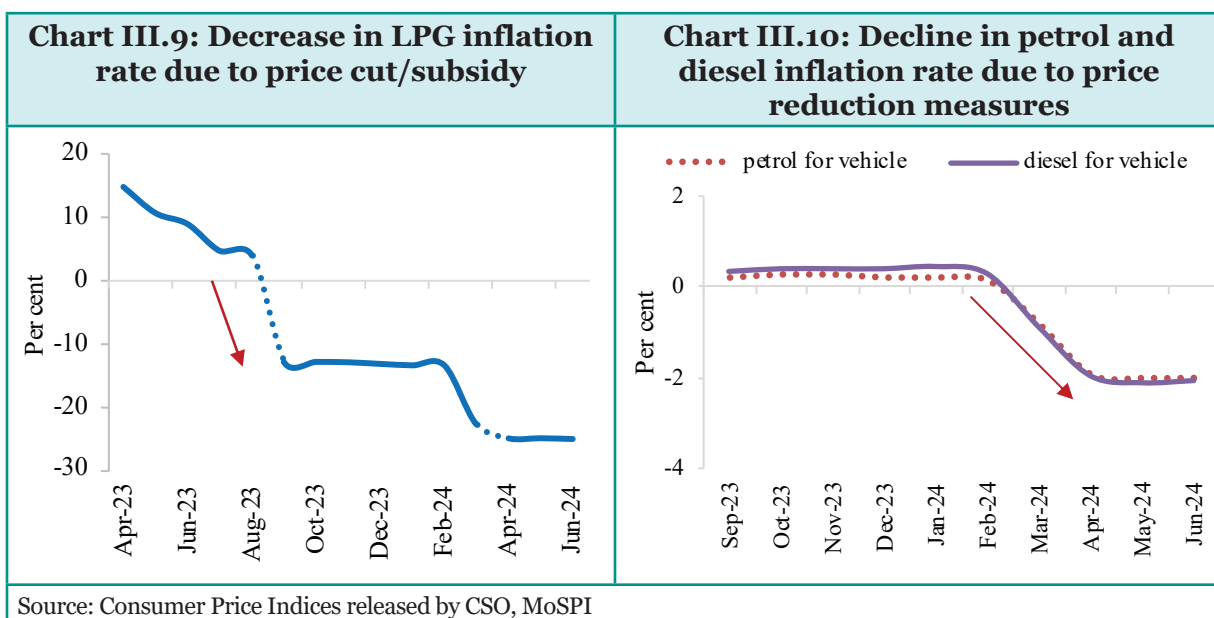
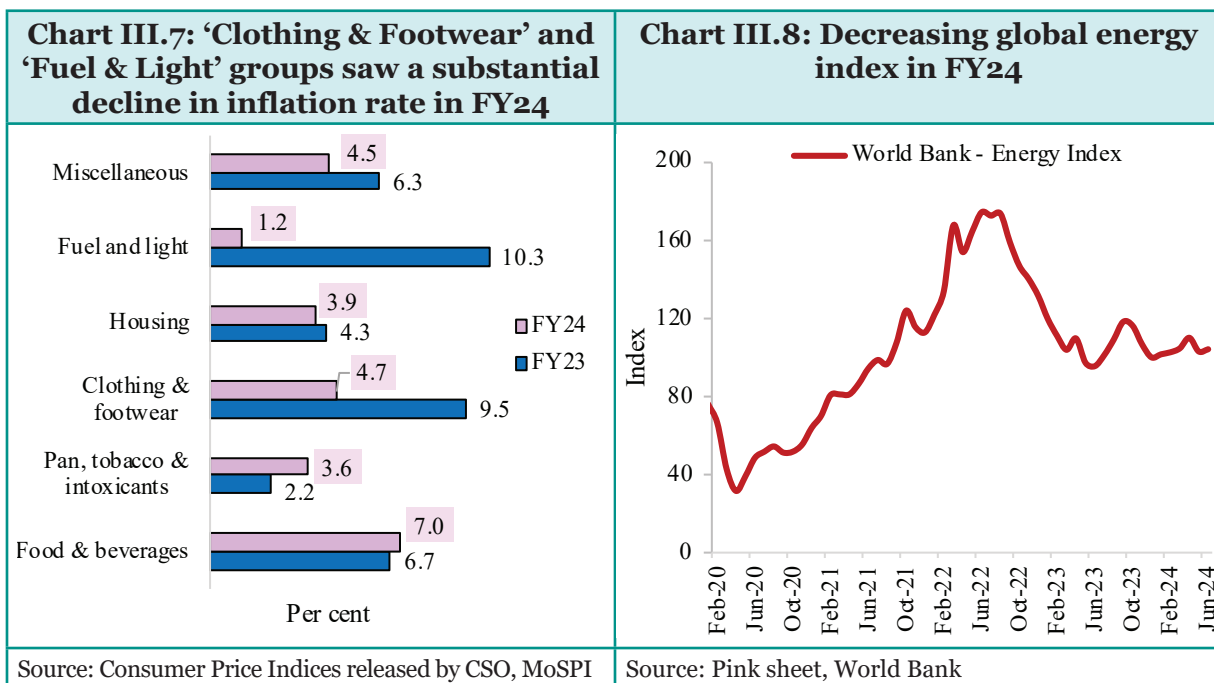
4 Jahan, Sarwat. Inflation Targeting: Holding the Line, Understanding Economics, Back to the Basics, Finance & Development, IMF <https://tinyurl.com/yjwn9ff6>

3.8. However, since May 2022, monetary policy broadly focused on absorbing excess liquidity in the system by increasing the policy repo rate by 250 basis points from 4 per cent in May 2022 to 6.5 per cent in February 2023. Thereafter, the policy rate was kept unchanged by focusing on the gradual withdrawal of accommodation, aiming to align inflation with the target, while simultaneously fostering growth. Consequently, the persistent and sticky core inflation observed in FY23 declined to 3.1 per cent in June 2024.



3.9. As the global energy price index experienced a sharp decline in FY24, retail fuel inflation also stayed low. The Central Government's announcement of price cuts for LPG, petrol, and diesel led to lower LPG and petroleum product inflation. In August 2023, the price of a domestic LPG cylinder was reduced by ₹200 per cylinder in all markets across the country. As a result, LPG inflation rate has been in the deflationary zone since September 2023. Again in March 2024, the price of non-subsidised LPG cylinders was reduced by ₹100 per cylinder. Similarly, in March 2024, the Central Government lowered the prices of petrol and diesel by ₹2 per litre. Subsequently, retail inflation in petrol and diesel used in vehicles moved to the deflationary zone in March 2024. Additionally, global commodity prices declined in 2023, reducing price pressure in energy, metals, minerals, and agricultural commodities through the imported inflation channel. Low fuel and core inflation ensured a downward trajectory for headline inflation, despite volatility in food prices in FY24.

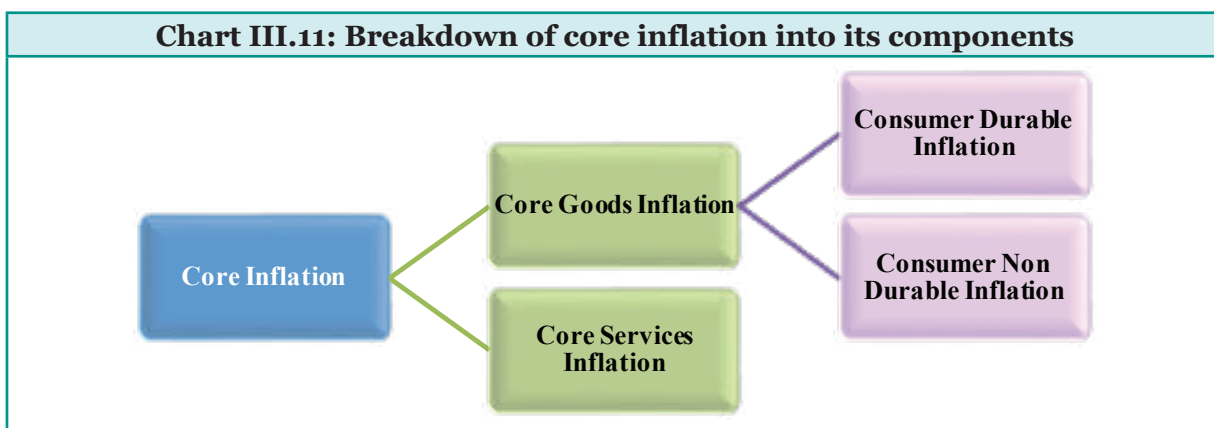
3.10. Thus, moderation in inflation was largely the result of prudent administrative measures and monetary policies implemented during the post-pandemic economic recovery phase. As per the recent data released by MoSPI, the retail inflation rate was 5.1 per cent in June 2024. In view of this, the following section examines the detailed trends and patterns in core and food inflation.



CORE INFLATION DYNAMICS IN THE POST-PANDEMIC WORLD

Core inflation hits a four-year low in FY24

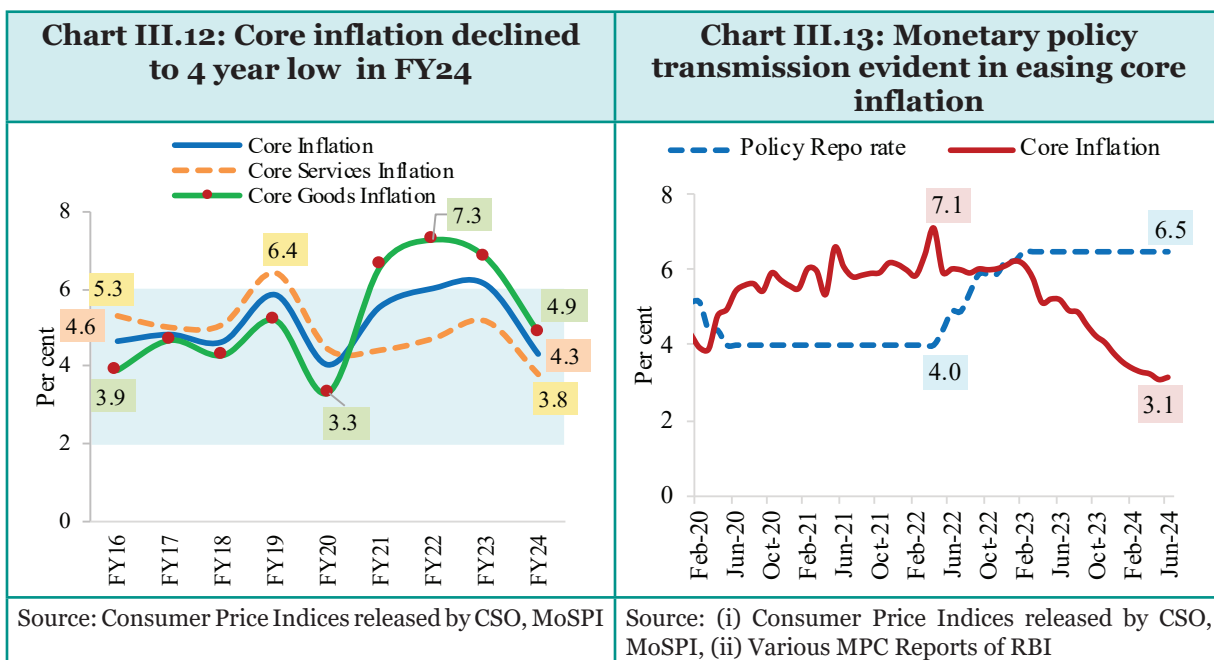
3.11. Core inflation is measured by excluding food and energy items from CPI headline inflation. It assesses the underlying price trends by largely eliminating the impact of price volatilities arising from transitory supply shocks. The following discussion splits core inflation into its goods and services components. Core goods are further split into consumer durables and consumer non-durables. The items and weights to segregate core goods and services indices is given in Annexure 1. The breakdown of core inflation into its components is given in Chart III.11.



3.12. From the pandemic-driven highs, inflationary pressures in India eased in FY22, aided by softening food inflation. However, core inflation had risen to 6 per cent at the same time, driven primarily by rising international commodity prices. As Chart III.12 shows, core services inflation inched up in the year, but the increase was lower than that of core consumer goods.

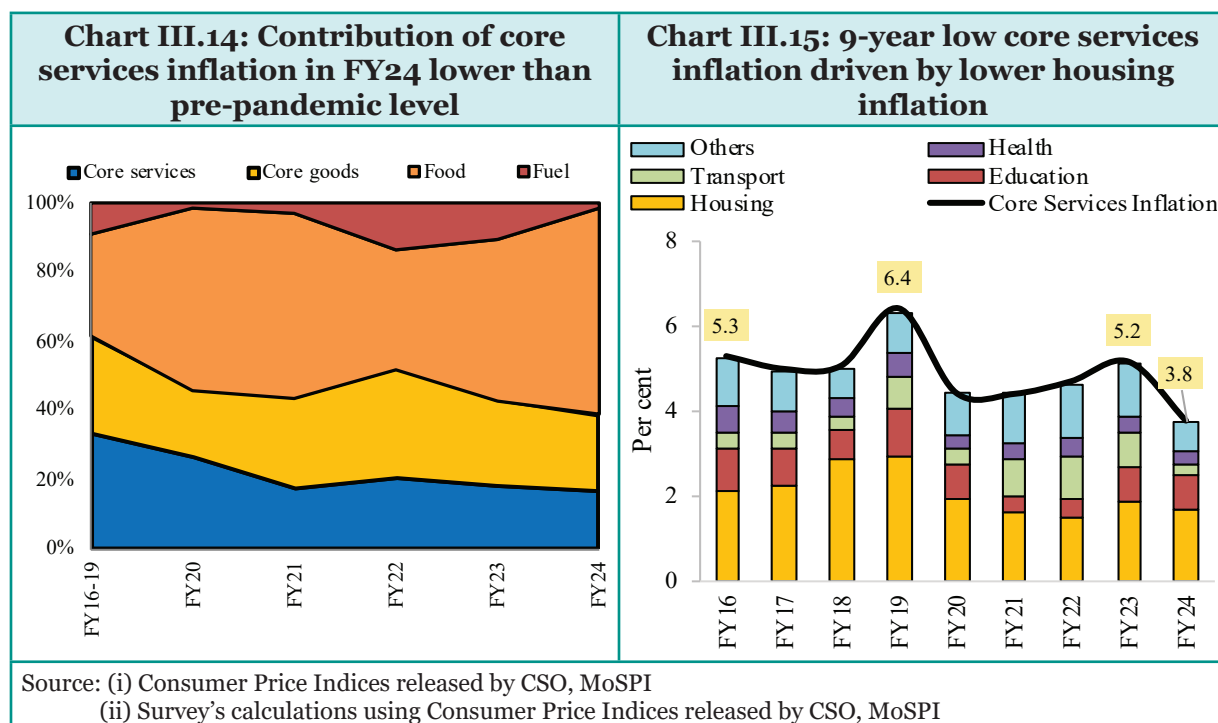
3.13. Inflationary pressures firmed up in FY23 yet again driven by the Russia-Ukraine war disrupting the recouping supply chains leading to a rise in food and fuel prices. As economic activity gained momentum, core inflation also increased slightly and was primarily driven by core services inflation as house rents went up, with people returning to urban areas (Chart III.15). In FY24, the price situation improved. CPI inflation moderated, driven by a decline in core inflation -both goods and services. Core services inflation eased to a nine-year low in FY24; at the same time, core goods inflation also declined to a four-year low.

3.14. Trends in core inflation are important in determining the contours of monetary policy. Assessing the emerging patterns of price pressures, the RBI increased the repo rate gradually by 250 basis points since May 2022 to reign inflationary pressures. Chart III.13 indicates the impact of monetary policy transmission on core inflation, which declined around 4 percentage points between April 2022 and June 2024.



A steep decline in service prices hastens moderation in core inflation

3.15. Stubborn core services prices are a risk factor for the inflation outlook of advanced economies (Box III.1). In contrast, India's core services inflation reached a nine-year low in FY24. This was aided by moderation in housing rental inflation, with a significant increase in the stock of new houses in 2023⁵.



Box III.1: Elevated risks for core services inflation in advanced economies

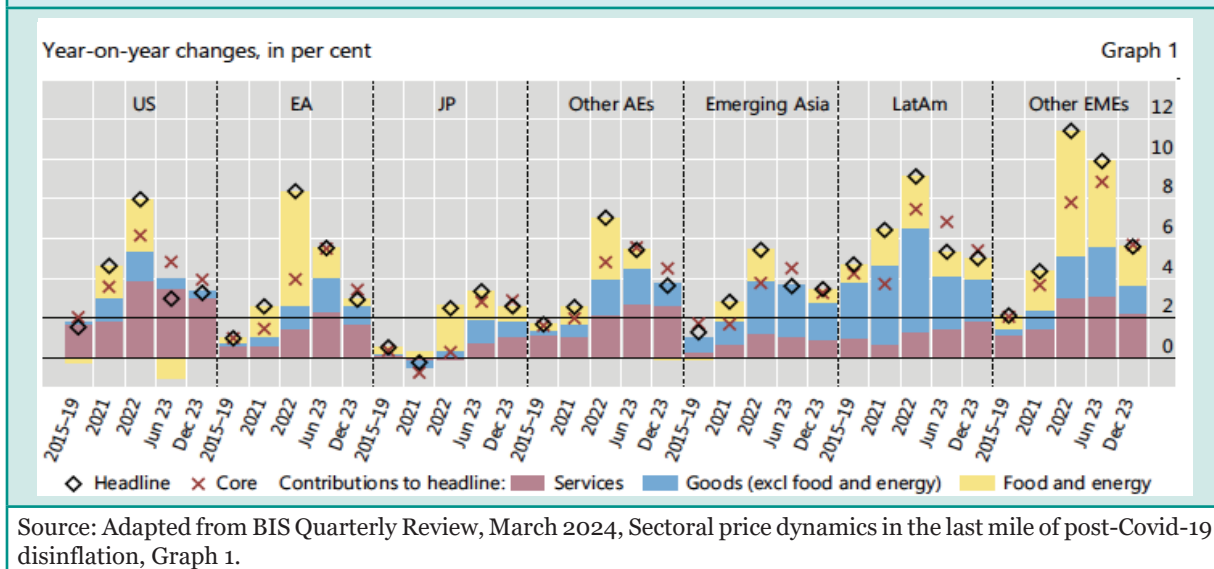
As per the March 2024 Quarterly Review of the Bank of International Settlements⁶, while there was a discernible retreat in the prices of food, energy and core goods following the gradual normalisation of the supply chain in 2023, the core services inflation remained elevated in 2023. The review also showed that the recent pace of deceleration in core goods prices closely matches the previous cases, while at the same time, the price growth in services has been more stubborn than it was in past inflation episodes. The persistent nature of service inflation is because of the much higher labour intensity in services. Rising housing prices also contributed to this.

These dynamics have played out similarly across countries and regions but less so in Asian emerging market economies and Latin America (Chart III.16). Going ahead, the persistence in the inflation of services has larger implications for AEs than for Emerging Market Economies (EMEs). This is because services carry a larger share in consumer price indices of AEs, posing a greater risk to their headline inflation outlook.

⁵ <https://www.proptiger.com/guide/post/new-home-sales-record-33-yoy-growth-in-2023-proptiger-com-report>

⁶ BIS Quarterly Review, March 2024, Sectoral price dynamics in the last mile of post-Covid-19 disinflation. https://www.bis.org/publ/qtrpdf/r_qt2403d.htm

Chart III.16: Persistent core services inflation risk in AEs



Consumer durable inflation remains elevated but softens in FY24

3.16. Consumer durables inflation increased progressively between FY20 and FY23 by more than 5 percentage points. FY21 witnessed a considerable increase in gold prices, a key component of the personal care category of CPI. In FY22 and FY23, clothing, which accounts for 48 per cent of weightage in the consumer durable index, was a major driver of inflation. The surge in the prices of key input materials used by apparel manufacturers, particularly cotton, led to this. With the improvement in the supply of key raw materials, the inflation rate for consumer durables declined in FY24. However, record-high gold prices, driven by anticipated Fed rate cuts and escalating geopolitical uncertainty, have exerted upward pressure on overall durables inflation.

Chart III.17: Consumer durables inflation closing to pre-pandemic levels

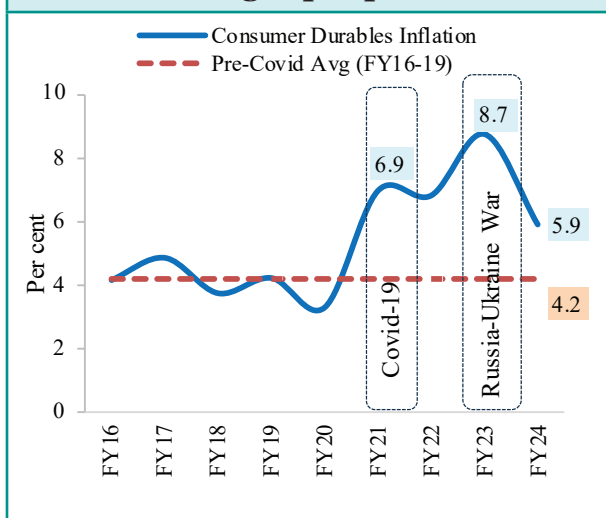
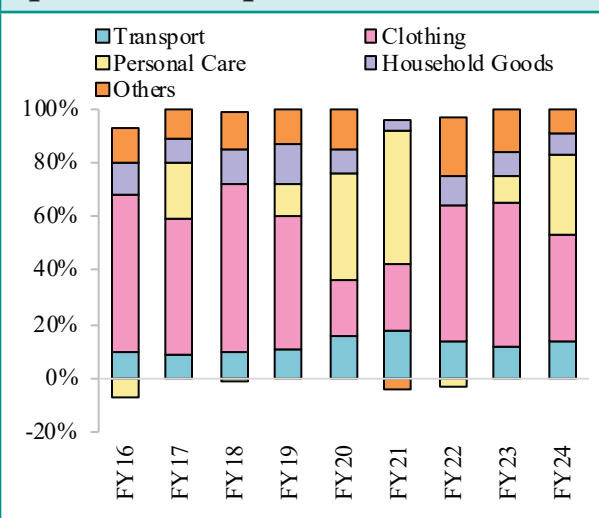
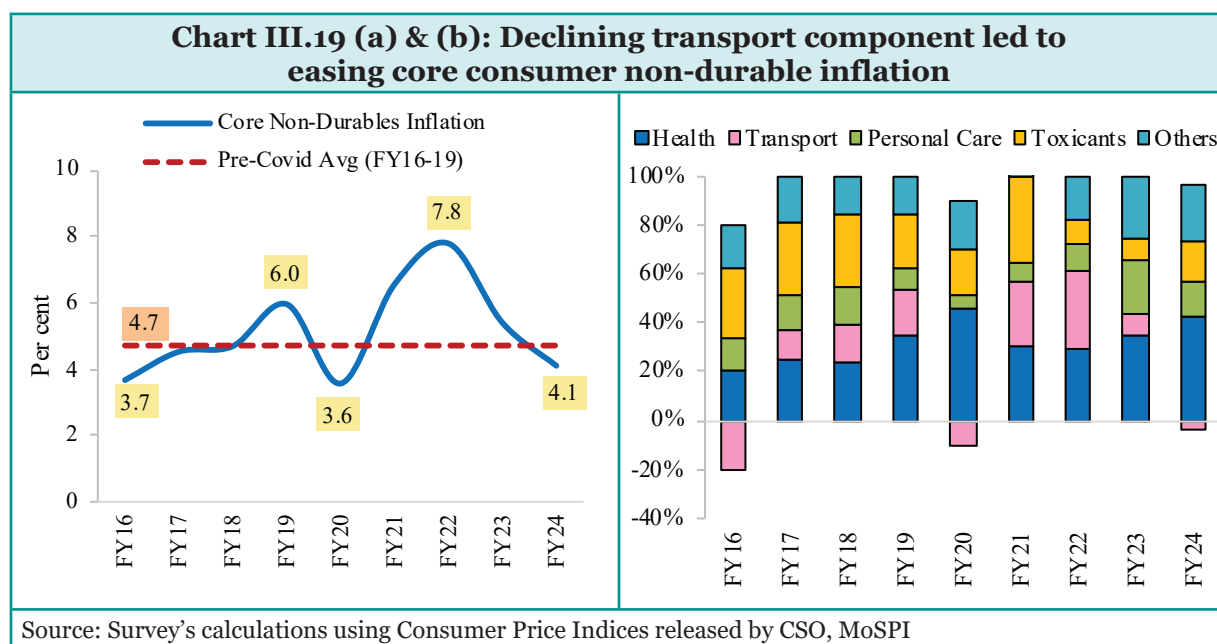


Chart III.18: Increased gold and cloth prices drove up inflation in durables



Core consumer non-durable inflation declines steeply

3.17. Consumer non-durables (CND) in the CPI basket have three components—food and beverages, fuel and other consumption items (details in Annexure 1). This section examines the other core consumer non-durable components (other consumption items of CND) only. Subsequent sections will examine ‘food and beverages’ while ‘fuel and light’ has already been elaborated in paragraph 3.9. While the core CND inflation plunged in FY20, it started to inch up in FY21, reached an all-time in FY22, and declined sharply in FY23 and FY24. The underlying cause for this has mainly been changes in the cost of transport components.

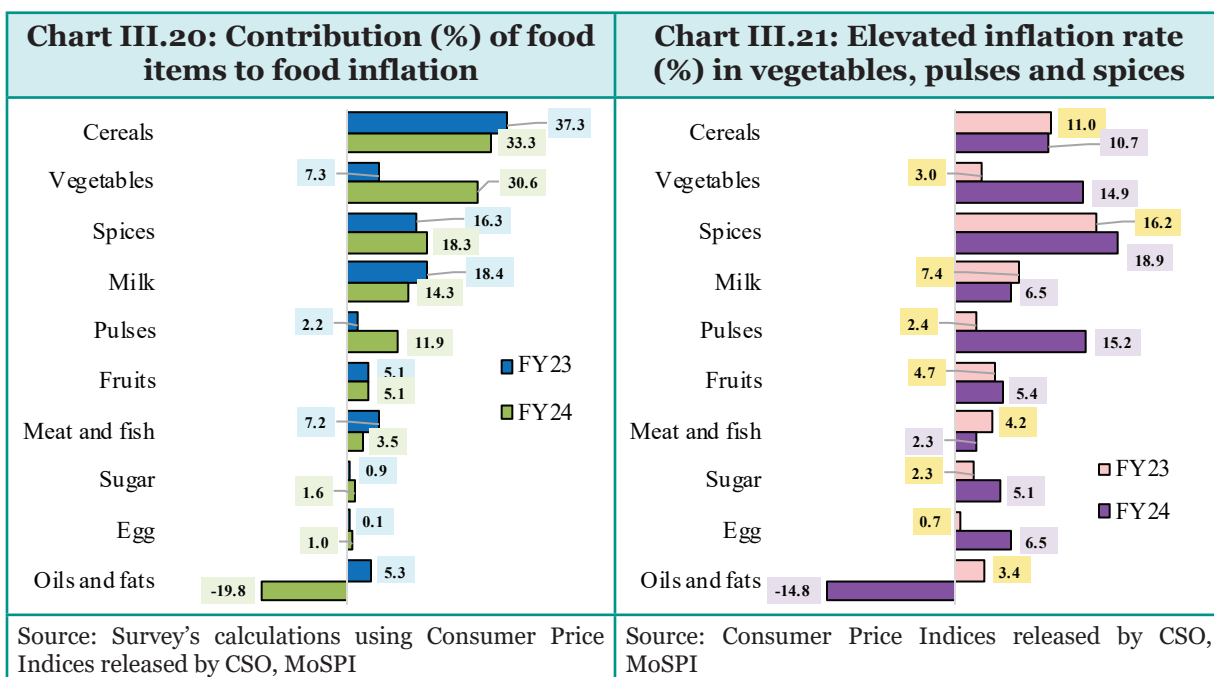


FOOD INFLATION

Food price pressures due to adverse weather conditions

3.18. Food inflation has been a global phenomenon in the last two years. Research⁷ indicates the rising vulnerability of food prices to climate change – heat waves, uneven monsoon distribution, unseasonal rainfall, hailstorms, torrential rainfall and historic dry conditions (Patra, John & George, 2024). In FY23 and FY24, the agriculture sector was affected by extreme weather events, lower reservoir levels, and damaged crops that adversely affected farm output and food prices. So, food inflation based on the Consumer Food Price Index (CFPI) increased from 3.8 per cent in FY22 to 6.6 per cent in FY23 and further to 7.5 per cent in FY24.

7 Patra, M. D., John, J., & George, A. T. (2024). Are Food Prices the ‘True’ Core of India’s Inflation? RBI Bulletin, 78(1): 87-98. <https://tinyurl.com/cv839ese>



Reasons for price pressures in major food items

3.19. The production prospects of vegetables and pulses were particularly impacted by unfavourable weather conditions. The increase in tomato prices in July 2023 was caused by seasonal changes in crop production, region-specific crop diseases such as white fly infestation, and the early arrival of monsoon rains in the northern part of the country. There were also logistics disruptions in isolated areas due to heavy rains. The spike in onion prices was due to several factors, including rainfall during the last harvesting season affecting the quality of rabi onions, delays in sowing during the kharif season, prolonged dry spells impacting kharif production, and trade-related measures taken by other countries.

3.20. The prices of pulses, particularly of tur, increased due to low production over the past two years, caused by adverse weather conditions. Urad production was affected by slow sowing progress in the rabi season coupled with climatic disturbances in the southern states. The area and output of gram was also lower compared to the previous rabi season.

3.21. Since the beginning of 2023, there has been an increase in the price of milk. This is due to a decrease in artificial inseminations during the peak days of the pandemic, as well as higher costs for animal feed. The milk cooperatives increased the price of milk and milk products to account for increased costs. The milk price increase moderated by the end of FY24.

3.22. However, the government took prompt actions, including open market sales, retailing in specified outlets, and timely imports, to ensure an adequate supply of essential food items (Box III.2). Additionally, to ensure food security for the poor, the Pradhan Mantri Garib Kalyan Anna Yojana, which provides free food grains to more than 81 crore beneficiaries, was extended for a period of five years starting from January 2024.

Box III.2: Administrative measures to contain food inflation in FY24

Wheat/Atta

- Export of wheat flour, maida and semolina was placed under a prohibited category since August 2022.
- To prevent hoarding and unscrupulous speculation, stock limits were imposed on wheat from June 2023 to March 2024.
- In November 2023, the Government introduced Bharat Atta at a subsidised price of ₹27.50 per kg to make it affordable for consumers.
- Wheat and rice are offloaded periodically from the central pool under open market sale.

Rice/Paddy

- The Government placed the export of broken rice and non-basmati rice under the prohibited category in September 2022 and July 2023, respectively.
- To prevent the export of non-basmati rice under the garb of basmati rice, the floor price for the export of basmati rice was fixed in October 2023.
- To maintain adequate stock and to keep domestic prices under check, the Government imposed a 20 per cent export duty on parboiled rice until 31 March 2024.
- In February 2024, the Government mandated to declare the stock position of rice/paddy by traders/wholesalers, retailers, big chain retailers and processors/millers.
- In February 2024, the Government introduced Bharat Rice at a subsidised price of ₹29 per kg for selling through NAFED, NCCF and Kendriya Bhandar.

Pulses

- Calibrated release of stocks from the buffer of pulses is being done to ensure availability and affordability to consumers.
- To augment domestic availability and moderate the prices of pulses, import of tur and urad has been kept under 'Free Category' until 31 March 2025. Basic import duty on masur was reduced to zero until 31 March 2024.
- The Government launched Bharat Dal in July 2023 to convert chana stock into chana dal for retail disposal at a highly subsidised rate. Later, the Bharat Dal was extended to include Moong Dal and Moong Sabut.
- Besides, India imported considerable quantities of Tur (mainly from Mozambique, Myanmar, Tanzania, Sudan and Malawi), Masur (mainly from Australia, Canada and Russia) and Urad (mainly from Myanmar) in FY24.

Onion

- The onion buffer size under PSF was increased from 1.00 LMT in FY21 to 7.00 LMT in FY24. The stock was released through retail sales, e-Nam auctions and bulk sales in wholesale markets.
- The Government placed a Minimum Export Price on specific varieties of onion from October 2023 to December 2023.
- In December 2023, the export policy of onions was amended from the 'free' to the 'prohibited' category until 31 March 2024.

Edible Oils

- The basic duty on crude palm oil, crude soyabean oil, and crude sunflower oil was cut from 2.5 per cent to nil. The agri-cess on oil was reduced from 20 per cent to 5 per cent. In January 2024, this duty structure was extended until 31 March 2025.
- The reduced basic duty structure on refined soybean oil, refined sunflower oil and refined palm oil was extended until 31 March 2025.
- Free import of refined palm oils was extended till further orders.

Sugar

- In October 2023, the Government extended the date of restrictions on the export of sugar (raw sugar, white sugar, refined sugar and organic sugar) beyond 31 October 2023 until further orders.

Global food prices and domestic inflation

3.23. In India, the edible oil market heavily depends on imports, with more than 50 per cent of the total edible oil requirement being imported⁸, making it sensitive to global prices. The Food and Agriculture Organisation (FAO) edible oils price index fluctuation is a key indicator of these global price trends. The recent downward trend in this index is broadly correlated with the decline in domestic edible oil prices in India. As a result, the Government closely monitors global market trends to ensure the availability of edible oils for consumers at an affordable price. Efforts are also made to balance imports with domestic production to mitigate the risks associated with global price volatility. In this context, the National Mission on Edible Oils - Oil Palm aims to increase domestic crude palm oil production to reduce the import burden.

3.24. In the case of sugar, the Government announced restrictions on export in June 2022 to ensure sufficient local supplies and thereby manage sugar inflation. These export restrictions have indeed played a role in stabilising domestic sugar prices. As a result, even though the global sugar price index inflated and has been showing volatility since February 2023, domestic sugar prices have remained much less volatile.

Chart III.22: Co-movement of global and domestic edible oil prices

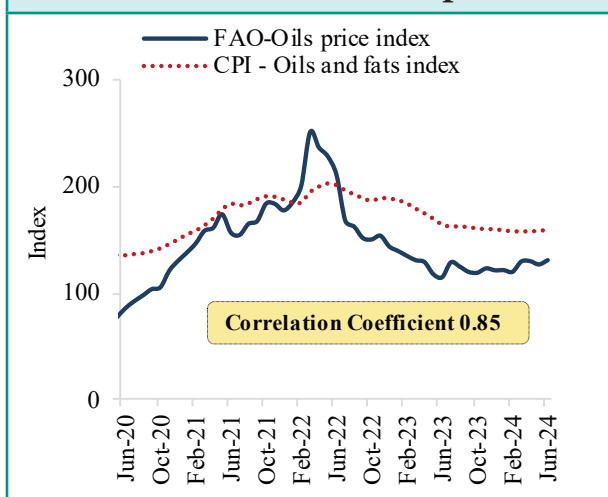
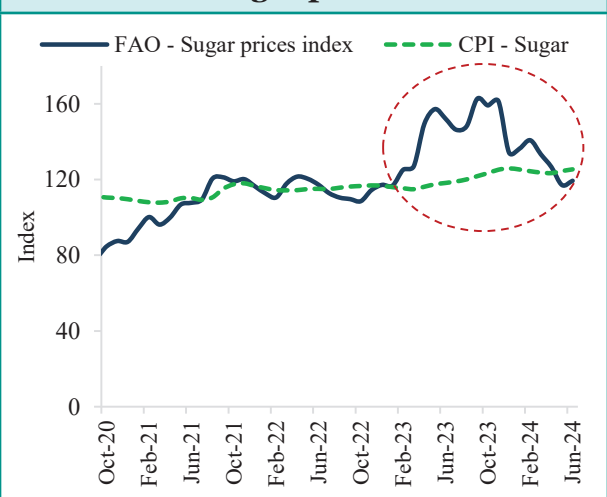


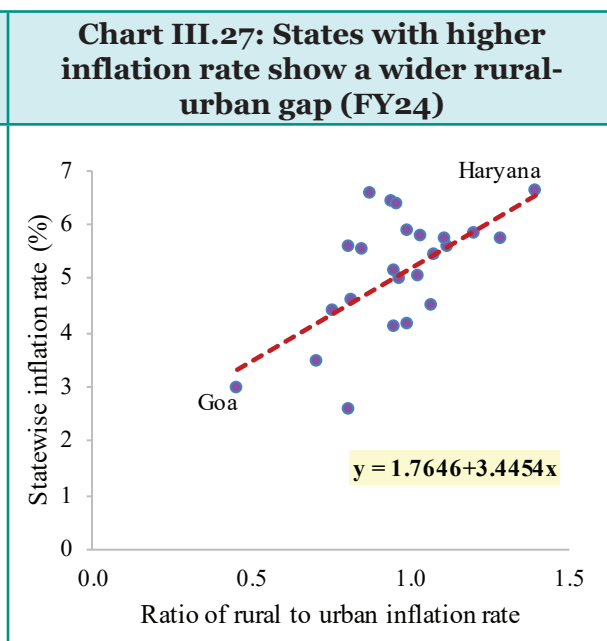
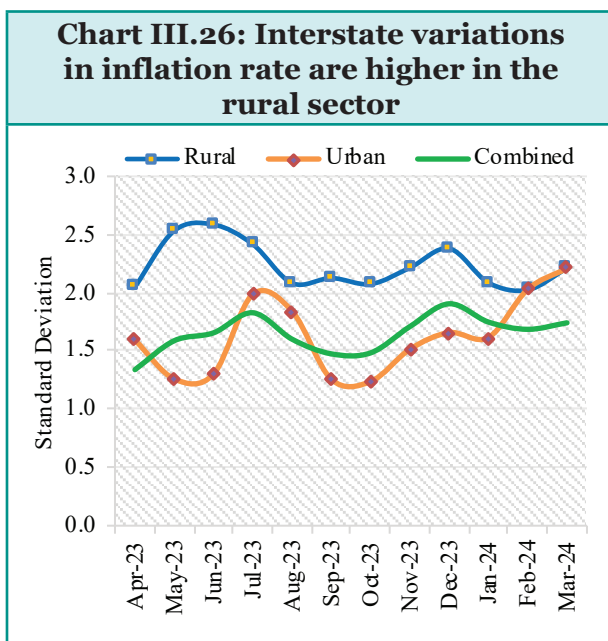
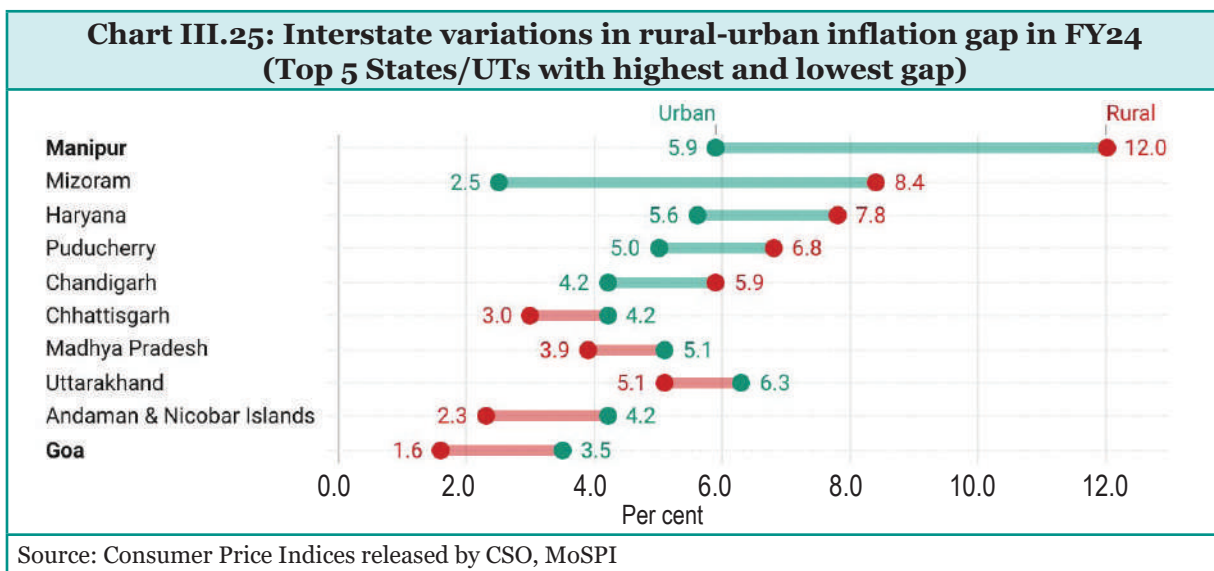
Chart III.23: Export ban on sugar led to stable sugar prices in India



Source: (i) Consumer Price Indices released by CSO, MoSPI (ii) Food price indices data released by FAO

8 PIB release dated 14 March 2024, Ministry of Agriculture and Farmers Welfare. <https://tinyurl.com/3w92nx5f>

exceeding urban inflation. A scatter plot of overall inflation for different States against their rural-to-urban inflation ratio reveals a positive correlation. For instance, the difference between rural and urban inflation in Haryana was much wider compared with Goa, which had relatively lower inflation.



Source: Consumer Price Indices released by CSO, MoSPI
 Note: The scatter plot is based on a sub-sample of 23 major states and NCT of Delhi

OUTLOOK AND WAY FORWARD

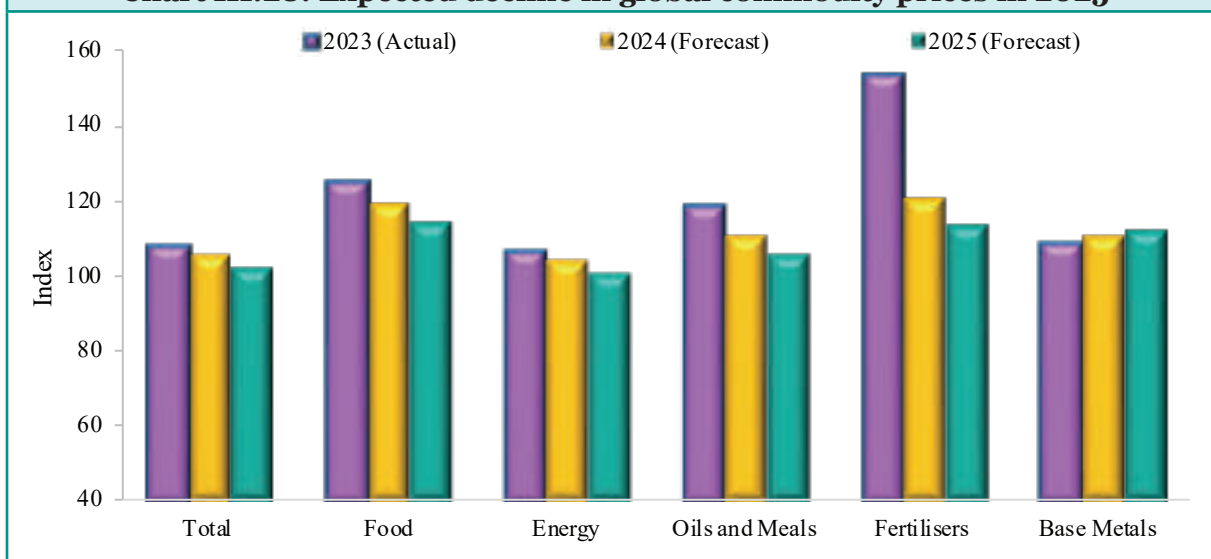
3.27. The RBI and the IMF have projected that India's consumer price inflation will progressively align towards the inflation target in FY26. Assuming a normal monsoon and no further external or policy shocks, the RBI⁹ expects headline inflation to be 4.5 per cent in FY25 and 4.1 per cent

9 Monetary Policy Report, April 2024, Page 7. <https://tinyurl.com/39p6phfu>

in FY26. IMF¹⁰ has projected an inflation rate of 4.6 per cent in 2024 and 4.2 per cent in 2025 for India.

3.28. The World Bank¹¹ expects that the global supply of commodities will increase, and so will their demand due to improved industrial activity and trade growth. It projects a 3 per cent decline in the commodity price index in 2024 and a 4 per cent decrease in 2025, mainly driven by lower energy, food and fertiliser prices. The energy price index is expected to reduce due to significant declines in coal and natural gas prices this year. Fertiliser prices are likely to weaken but remain above 2015-2019 levels due to strong demand and export restrictions. Base metal prices are projected to rise, reflecting increased global industrial activity and clean energy production. In general, the current downward movement in the prices of commodities imported by India is a positive for the domestic inflation outlook.

Chart III.28: Expected decline in global commodity prices in 2025



Source: World Bank Commodity Price Forecast released in April 2024

Note: (i) Total price index is composed of energy and non-energy prices (excluding precious metals), weighted by their share in 2002-04 exports.

(ii) The energy price index includes coal (Australia), crude oil (Brent), and natural gas (Europe, Japan, U.S.).

(iii) Metals & minerals include iron ore, aluminium, copper, lead, nickel, tin, and zinc.

3.29. On balance, the short-term inflation outlook for India is benign. However, from the angle of long-term price stability, the following options may be worth exploring.

- The domestic consumption of edible oils has been increasing faster than production, leading to increased import dependence. To reverse this pattern and to stabilise domestic prices, it is important to make focused efforts to increase the production of major oilseeds such as sunflower and rapeseed & mustard, and explore the potential of non-conventional oils such as rice bran oil and corn oil. The possibility of expanding the scope of the National Mission on Edible Oils beyond palm oil to other major oilseeds is worth an examination.

10 World Economic Outlook, April 2024, page 36. <https://tinyurl.com/38pederj>

11 World Bank's Commodity Markets Outlook Report of April 2024. <https://tinyurl.com/2vzxr694>

- India faces a persistent deficit in pulses and consequent price pressures. Production of pulses is concentrated in a few states and districts in the country, and is vulnerable to biotic and abiotic stresses. More efforts are needed to expand the area under pulses, particularly lentils, tur, and urad, in more districts and rice-fallow areas. It is also worth considering promoting the summer cultivation of urad and moong in areas with assured irrigation facilities.
- There have been many efforts by the Government to improve the storage and processing facilities for vegetables. In view of the continuing seasonal surges in the prices of vegetables like tomato and onion, it is important to assess the progress in developing modern storage facilities conducive to such specific crops, and evaluate the viability of such facilities whose services have highly seasonal demand.
- FY24 witnessed swift and effective administrative action by the Government to deal with price flare-ups in specific items. This was based on daily monitoring of prices at more than 500 centres. Prospectively, an important factor that can improve the swiftness and effectiveness of such action is complete clarity on prices and their indices. On this front, it may be important to fine-tune and expedite the ongoing action in the following areas.
 - The high-frequency price monitoring data for essential food items collected by different departments may be linked in such a way that the build-up of prices at each stage from the farm gate to the final consumer is quantifiable and monitorable.
 - The ongoing efforts to construct the producer price index for goods and services may be expedited to have a greater grasp of episodes of cost-push inflation. Further, considering that the results of the household consumer expenditure survey, 2022-23 of MoSPI are available, it may be appropriate to expeditiously revise the consumer price index with fresh weights and item baskets.

**Annexure 1: Group of items and their weights used for the derived
consumer prices indices for the components of core inflation**

					Core goods			
	Core services		Core goods		Consumer non-durables		Consumer durables	
Major Groups/sub-groups	No. of Items	Total Weight	No. of Items	Total Weight	No. of Items	Total Weight	No. of Items	Total Weight
Pan, tobacco and intoxicants	–	–	16	2.4	16	2.4	–	–
Clothing and footwear	2	0.5	25	6.0	–	–	25	6.0
Household goods and services	4	0.9	44	2.9	8	1.7	36	1.2
Health	4	1.8	3	4.1	2	4.0	1	0.1
Transport and communication	13	4.6	8	4.0	3	2.4	5	1.6
Recreation and amusement	8	1.1	9	0.6	1	0.2	8	0.4
Education	3	3.5	2	1.0	2	1.0	–	–
Personal care and effects	1	0.6	15	3.3	7	2.1	8	1.3
Housing	10	10.1	–	–	–	–	–	–
Total	45	23.0	122	24.3	39	13.7	83	10.6
Source: Calculated from the Consumer Price Indices released by CSO, MoSPI								
Note: The total weight of core goods and services in the Consumer Price Index is 47.3 per cent, which is the total of the weights of core goods and core services. The total weights of consumer non-durables and consumer durables add up to the total weights of core goods.								

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EXTERNAL SECTOR: STABILITY AMID PLENTY

India's external sector remained strong amidst ongoing geopolitical headwinds accompanied by sticky inflation. Though merchandise exports moderated owing to lower demand from major trading partners, services exports continued to perform well, cushioning the overall trade deficit from USD 121.6 billion in FY23 to USD 78.1 billion in FY24. Lower prices of imported commodities, including crude oil, also helped.

The moderation in merchandise imports and rising services exports have improved India's current account deficit (CAD). Amongst services exports, software/IT services have driven an increase in overall exports; at the same time, business services exports have also been rising, supported by India emerging as a hub for Global Capability Centres (GCCs).

India is moving up the global value chains (GVCs), with the share of GVC-related trade in gross trade rising to 40.3 per cent in 2022 from 35.1 per cent in 2019. The improvement in GVC participation is also reflected in increased pure backward GVC participation. Aided by government measures on trade facilitation and reduction in logistics cost, India's rank in the World Bank's Logistics Performance Index improved by six places, from 44th in 2018 to 38th in 2023 out of 139 countries.

India witnessed positive net foreign portfolio investment (FPI) inflows in FY24 of USD 44.1 billion, supported by strong economic growth, a stable business environment, and increased investor confidence. Rising FPI inflows kept the Indian Rupee in a manageable range of ₹82 to ₹83.5/USD in FY24. The Rupee emerged as the least volatile currency among its emerging market peers and a few advanced economies in FY24. The shock absorbers of India's external sector - forex reserves, sustainable external debt indicators, and market-determined exchange rate, are in place to cushion the global headwinds.

In the future, the changing composition of India's export basket, enhancement in trade-related infrastructure, enhanced quality consciousness and product safety considerations in the private sector and stable policy environment are expected to play a significant role in driving India's rise as a global supplier of goods and services.

INTRODUCTION

4.1 Since the COVID-19 pandemic, the global economy has been buffeted by several shocks - the Russia-Ukraine conflict, developments in the Middle East and the Red Sea crisis, leading to supply dislocations in several commodities and a considerable rise in inflation in many countries. Moreover, citizens of about 64 countries (plus the European Union), about 49 per cent of the world population, will exercise their franchise in 2024. This adds to the policy uncertainty confronting the global economy, especially in the context of international trade and immigration policies. Foreign investments, which drive international trade and commerce, have slowed down recently due to these uncertainties, higher interest rates in the developed world, and the pursuit of active industrial policies by developed countries. For example, the Inflation Reduction Act of the United States of America not only incentivised investment capital to stay at home but also lured capital from elsewhere.¹

4.2 As per the United Nations Conference on Trade and Development (UNCTAD)², global foreign direct investment (FDI) decreased marginally by 2 per cent to USD 1.3 trillion in 2023 from USD 1.4 trillion in 2022. Global trade, too, has been on a slow path, with the value of world merchandise trade declining by 5 per cent in 2023. External debt as a percentage of GDP of Emerging Market and Developing Economies (EMDEs) increased from 26.2 per cent in 2012 to 29.8 per cent in 2023. After witnessing a deficit in their current account balance in 2022, Advanced Economies (AEs) saw a surplus in 2023. For EMDEs, the current account balance has been in surplus in 2022 and 2023, albeit a moderation from 1.5 per cent of the GDP in 2022 to 0.6 per cent of GDP in 2023.³

4.3 Against this backdrop, the chapter deals with India's performance on external sector-related parameters. Section 1 discusses prevailing global trade dynamics and the impact of ongoing geopolitical headwinds on trade. Section 2 focuses on India's international trade sector, presenting some specific case studies on industries that have shown remarkable export performances while also dwelling on the general trends. It also presents the outcomes of some of India's latest Free Trade Agreements (FTAs). The section further presents some analytical understanding of the exposure of our exports to imports from various countries and the need for preparedness in the wake of any external unforeseen supply shocks. Section 3 presents in some detail the trends in capital flows into the country and draws some insights from the trends. Section 4 presents the country's balance of payments (BoP) situation, comparing it with some peer countries. It also presents the position of our foreign exchange reserves (FER) and international investment position (IIP), which buffer the economy from an uncertain external environment turning adverse. Section 5 dwells on India's external debt trends and how it has been deftly managed. Section 6 concludes with the outlook for the external sector while mentioning the key challenges to tackle.

1 'How the US Mopped Up a Third of Global Capital Flows Since Covid', Bloomberg, 16 June 2024 (<https://tinyurl.com/39y8kt85> - accessed 22 June 2024)

2 UNCTAD World Investment Report 2024-Investment Facilitation and Digital Government; <https://tinyurl.com/3ycsh79c>

3 As per the IMF World Economic Outlook Database

CHANGING GLOBAL TRADE DYNAMICS

4.4 Trade is a key pillar of an economy, spurring investment, job creation, economic growth, and raising living standards. Global trade patterns are reconfiguring. In 2023, Mexico became the largest goods trade partner of the US, surpassing China and Canada, with a total trade of USD 798 billion.⁴ Vietnam's trade with China and the US has recently seen an increase. US imports from Vietnam more than doubled from USD 46 billion in 2017 to USD 114 billion in 2023. During the same time, Vietnam's imports from China rose from USD 58 billion to USD 111 billion.⁵ In another instance, European economies are shifting their energy imports from Russia to Norway and the US. EU's pipeline gas imports from Russia declined from 150.2 billion cubic meters in 2021 to 42.9 billion cubic meters in 2023. During the same time, its pipeline gas imports from the US rose from 18.9 billion cubic meters to 56.2 billion cubic meters.⁶ These shifts reflect the emergence of new practices in international trade such as 'decoupling', 'derisking', 'reshoring', 'nearshoring', and 'friend sharing' and the growing narrative of de-globalisation.⁷

4.5 However, there is an argument that while the growth of trade as a percentage of GDP has stalled since the global financial crisis, the slowdown of global trade seems a natural development following its earlier fast growth (Chart IV.2).⁸ The de-globalisation trends are highly heterogeneous across countries. While the US and China are gradually decreasing their reliance on global markets, this does not seem true for the rest of the world.⁹ Research by the Bank for International Settlement (BIS) shows that despite its policies, the US remains reliant on Chinese inputs. In fact, the rise in trade through Mexico and Vietnam is a result of Chinese firms re-routing their supply through these countries (or by locating themselves in these countries). Further, China's overwhelming dominance in the supply of processed critical minerals and materials for energy transition renders a true decoupling between the two nations neither easy nor likely.

4.6 As can be seen in Chart IV.1, global trade volume contracted by 1.2 per cent in 2023 after recording a 3 per cent expansion in 2022 following the outbreak of the Russia-Ukraine conflict.¹⁰ The value of world merchandise trade fell by 5 per cent in 2023, indicating the effect of lower prices. This decline was offset mainly by a substantial increase in trade in commercial services, which rose by 9 per cent to USD 7.5 billion in 2023. Commercial services trade was lifted by

4 India-Mexico Trade and Commercial Relations, para 3, <https://tinyurl.com/5h4v96jp>,

5 Source: Vietnam Customs Office and US Census Bureau, <https://www.customs.gov.vn/index.jsp?pageId=4964>, <https://www.census.gov/en.html>

6 Source: European Commission based on ENTSO-G and Refinitiv, <https://www.consilium.europa.eu/en/infographics/eu-gas-supply/#0>

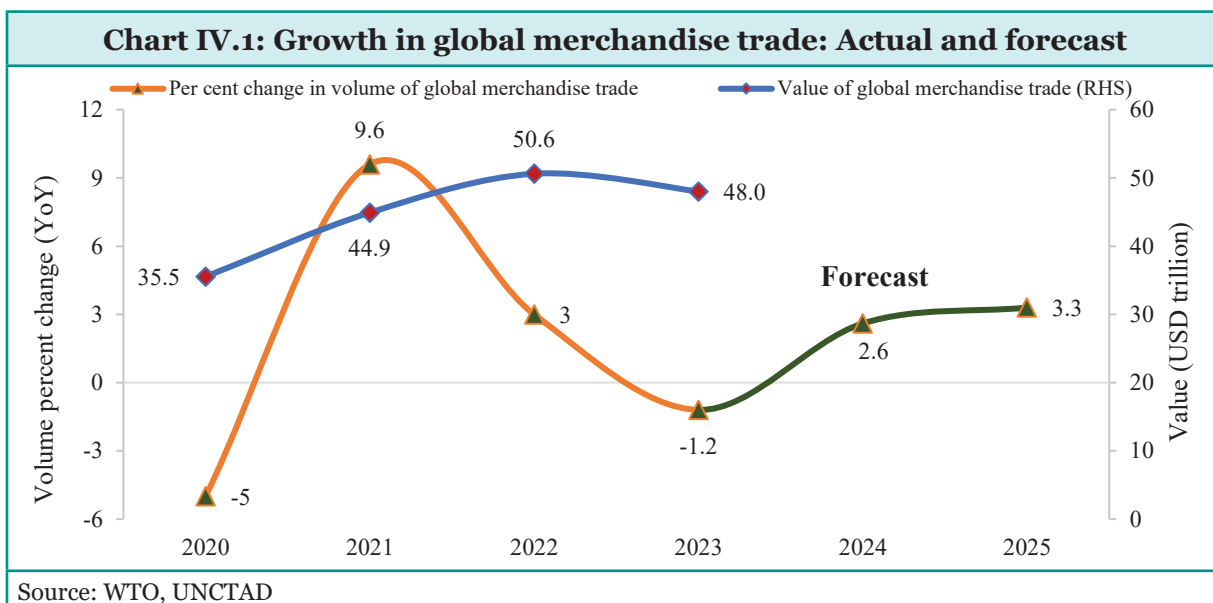
7 As per the World Economic Forum, friend-shoring refers to rerouting supply chains to countries perceived as politically and economically safe or low-risk to avoid disruption to the flow of business. Nearshoring refers to a company relocating business operations to a nearby country, often with a shared border. Reshoring is when a business transfers operations back to its home country.

8 Goldberg, P. K., & Reed, T. (2023). Is the Global Economy Deglobalizing? And if so, why? And what is next? (No. w31115). National Bureau of Economic Research, <https://www.nber.org/papers/w31115>

9 Qiu, H., Shin, H. S., & Zhang, L. S. Y. (2023). Mapping the realignment of global value chains (No. 78). Bank for International Settlements

10 WTO Global Trade Outlook and Statistics (April 2024), https://www.wto.org/english/res_e/booksp_e/trade_outlook24_e.pdf

recovering international travel and increasing digitally delivered services. Global exports of digitally delivered services rose by 9 per cent to USD 4.3 trillion in 2023, accounting for 13.8 per cent of the world exports of goods and services.



4.7 The adverse trade environment in 2023 is expected to ease somewhat this year and next, boosting goods trade in 2024 and 2025.¹¹ World merchandise trade volume is expected to grow at 2.6 per cent and 3.3 per cent in 2024 and 2025, respectively, as demand for traded goods rebounds. The evidence of a rebound in global trade in 2025 is visible in the latest report released by UNCTAD.¹² As per the report, global trade trends turned positive in the first quarter of 2024, with the value of trade in goods increasing by around 1 per cent quarter-over-quarter and services by about 1.5 per cent. The growth was primarily driven by increased exports from China (9 per cent), India (7 per cent) and the USA (3 per cent). However, geopolitical tensions and policy uncertainty could limit the scope of any trade rebound. While export growth is expected to improve in many economies as external demand for goods picks up, food and energy prices could again spike due to geopolitical events and climate disturbances. Further, restrictive trade practices increasingly adopted by many countries are leading to higher prices because supply chains have become increasingly complex.¹³

4.8 The resilience of global trade is being tested by disruptions on two of the world's leading shipping routes, viz the Panama Canal and the Suez Canal. The Panama Canal handles 6 per cent of global trade and over 70 per cent of traffic destined for or originating from the US. It is presently operating at partial capacity due to freshwater shortages, with restrictions likely to remain in place for some time. Meanwhile, the Suez Canal handles about 12 per cent of global trade and about one-third of container shipping between Asia and Europe.¹⁴ The traffic

¹¹ Ibid, Note 10

¹² UNCTAD report, 'Global trade growth resumes in first quarter of 2024', <https://tinyurl.com/3hefazed>

¹³ World Bank blog dated 22 February 2024, 'Global trade has nearly flatlined. Populism is taking a toll on growth', <https://tinyurl.com/4h6enb43>

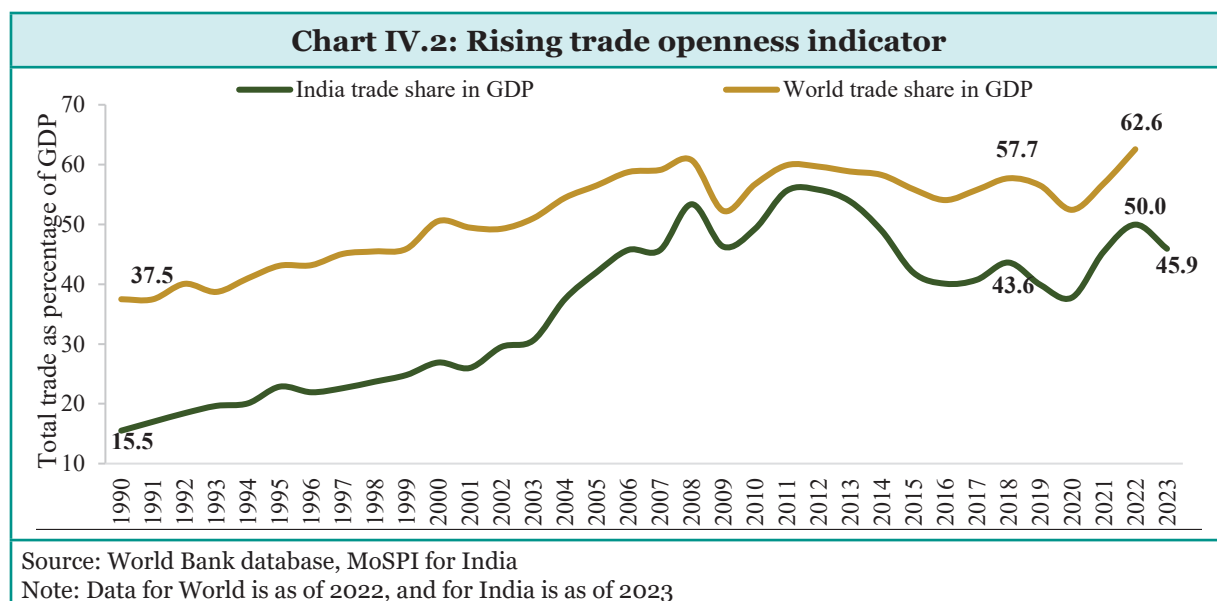
¹⁴ Ibid, Note 10

diversion from the Red Sea and around the Cape of Good Hope has added ten days to Asia-Europe journeys while also increasing fuel costs. Although global shipping costs returned to pre-pandemic levels by the middle of last year, container shipping rates have risen again. Extended detours around the Cape of Good Hope have led to a significant surge in ocean freight rates, reaching up to USD 10,000 per 40-foot container. Moreover, the Suez Canal Authority has declared a 5-15 per cent hike in transit fees for ships passing through the Panama Canal.¹⁵

4.9 Amidst these prevailing geopolitical dynamics, India is expected to benefit from its strong trade relations across countries, as the analysis in the subsequent sections shows. India has broad and diversified trade relationships with Asia, Europe, and the US. The following section discusses India's trade performance.

INDIA'S TRADE: RESILIENCE AMIDST GLOBAL TURMOIL

4.10 International trade has contributed to India's economic growth. Over time, through concerted reforms and facilitative measures to enhance trade, there has been a significant increase in the share of trade (goods and services) in GDP. The trade openness indicator¹⁶, which rose from 37.5 in FY05 to 45.9 in FY24, has contributed significantly to economic growth as it facilitated an efficient allocation of resources through comparative advantage. The share of trade (excluding petroleum products exports and crude oil imports) in GDP rose from 32.3 per cent in FY05 to 40.8 in FY23. India's trade has been catching up with global levels, as reflected in Chart IV.2 below.



¹⁵ GEP Intelligence Drives Innovation blog on 'Red Sea Crisis: How rerouting is impacting shipping costs', <https://www.gep.com/blog/mind/red-sea-crisis-how-rerouting-is-impacting-shipping-costs>

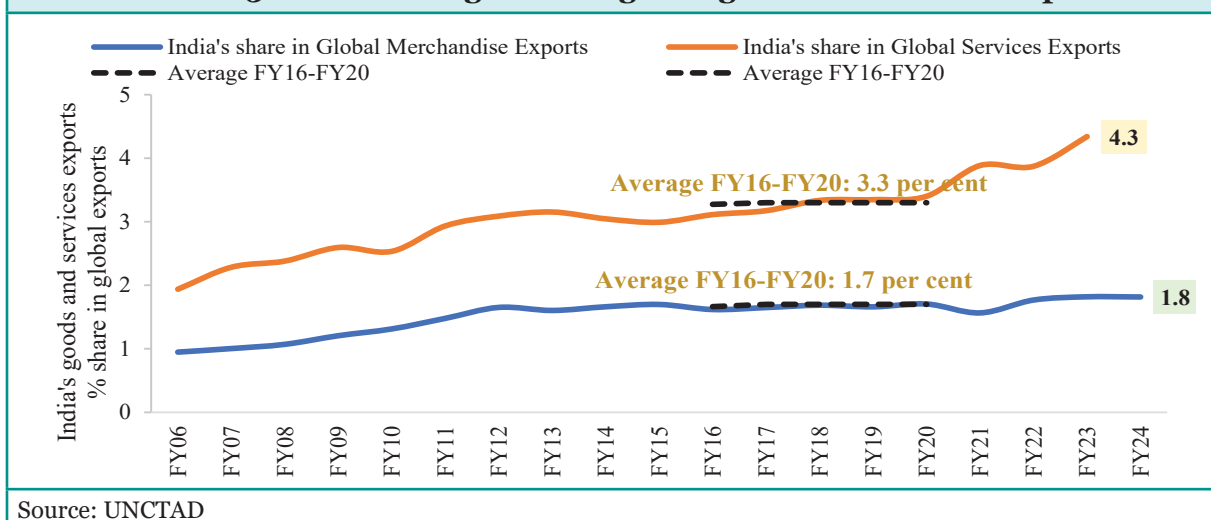
¹⁶ Trade openness indicator is calculated by taking the sum of exports and imports of goods and services as per cent of nominal GDP.

Table IV.1: Key aspects of India's trade (Calendar year-wise)

	2020	2021	2022
Export performance (in per cent)			
Share in World Merchandise Exports	1.6	1.8	1.8
Share in World Commercial Services Exports	4.1	4.0	4.4
Share in World Merchandise Plus Services Exports	2.1	2.2	2.4
Import Performance (in per cent)			
Share in World Merchandise Imports	2.1	2.5	2.8
Share in World Commercial Services Imports	3.3	3.5	4.0
Share in World Merchandise Plus Services Imports	2.3	2.7	3.0
India's rank in world trade			
Merchandise Exports	21.0	18.0	18.0
Merchandise Imports	14.0	10.0	9.0
Services Exports	7.0	8.0	7.0
Services Imports	10.0	10.0	8.0

Source: DGFT, Monthly Bulletin on Foreign Trade Statistics, April 2024

4.11 Chart IV.3 indicates that India is gaining market share in global exports of goods and services. Its share in global goods exports was 1.8 per cent in FY24, against an average of 1.7 per cent during FY16-FY20. Similarly, its share in global services exports rose to 4.3 per cent in FY23 from an average of 3.3 per cent during FY16-FY20.

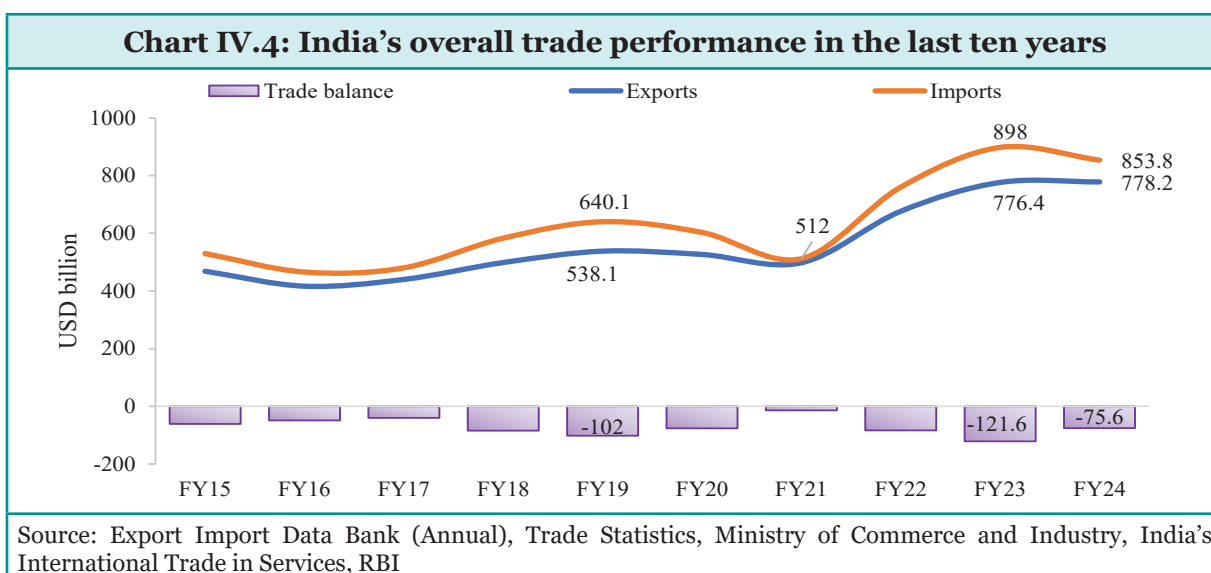
Chart IV.3: India's rising share in global goods and services exports

India's Overall trade

4.12 India's overall exports (merchandise and services) have been growing on a secular basis since FY17 for almost three years. However, FY20 saw an economic slowdown, aggravated by the

outbreak of the global pandemic, which halted this trend. FY22 marked a significant turnaround. A similar trend has been observed in overall imports (merchandise and services). The positive momentum extended into FY23, with India's overall exports crossing USD 776 billion. Overall imports also increased to USD 898 billion in FY23 compared to USD 760.1 billion in FY22. Despite persistent global challenges, overall exports in FY24 surpassed the FY23 record, growing by 0.23 per cent, and overall imports in FY24 declined by 4.9 per cent despite robust domestic demand. During the first two months of FY25, overall exports increased to USD 133.6 billion, compared to USD 122.4 billion in the corresponding period of the previous year. During the same time period, overall imports also increased from USD 136.4 billion to USD 149.9 billion, leading to a widening of the overall trade deficit from USD 14 billion to USD 16.3 billion.

Chart IV.4: India's overall trade performance in the last ten years

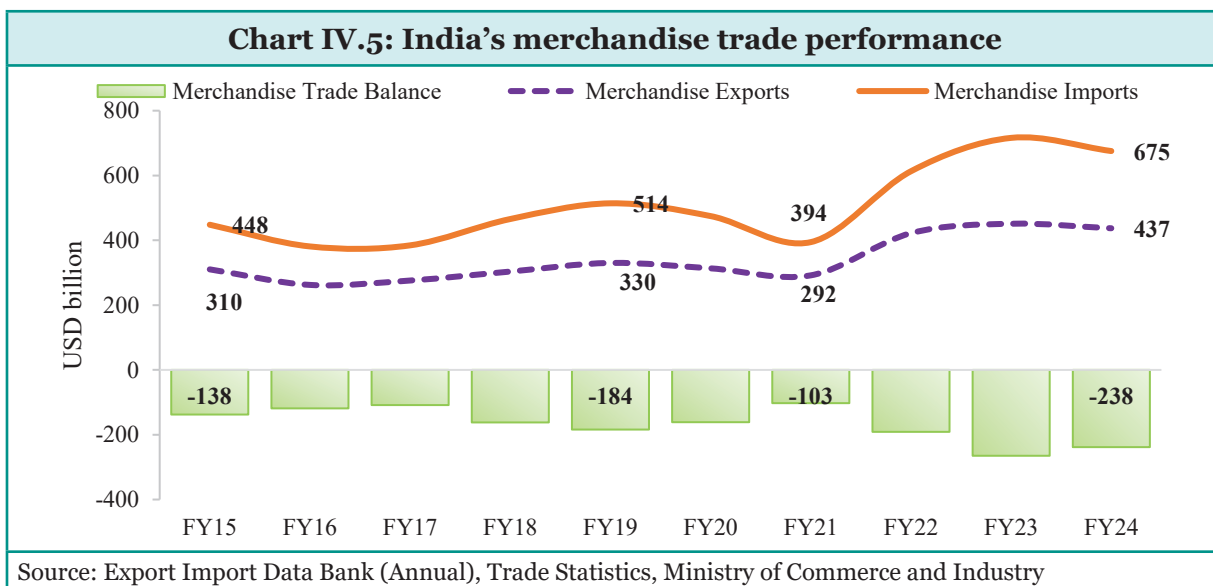


Merchandise Trade: Enduring the global headwinds

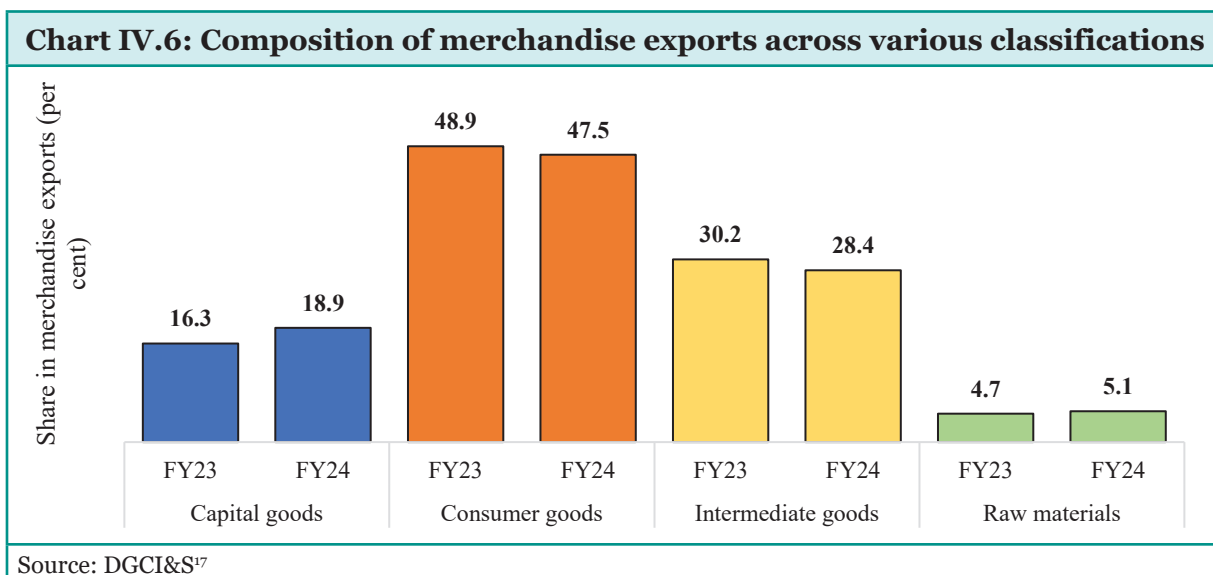
Merchandise exports

4.13 Affected by ongoing geopolitical tensions, India's merchandise exports witnessed contraction in H2 of FY23 and H1 of FY24. However, there is evidence of a trend reversal in H2 of FY24, with merchandise exports registering positive growth. Box IV.1 discusses the sectors that have shown remarkable export performance in the past few years. With rising exports, imports also witnessed positive growth in H2 of FY24. However, despite registering positive growth in H2 FY24, merchandise exports and imports contracted in FY24 compared to FY23. The decline in merchandise exports was mainly on account of a slowdown in India's major exporting partners (especially the EU, whose real GDP grew barely by 0.6 per cent in 2023, compared to 3.6 per cent growth in 2024), along with the lagged impact of monetary tightening carried out by many countries to control rising inflation. While the volume of imports did not decline in FY24, the overall value of merchandise imports declined due to a fall in global commodity prices. Owing to a larger decline in imports than exports, the merchandise trade deficit narrowed to USD 238.3 billion in FY24 compared to USD 264.9 billion in the previous

year. The non-petroleum and non-gems and jewellery merchandise exports have shown resilience with a sustained uptick in the last few months, resulting in exports worth USD 320.2 billion in FY24, 1.5 per cent higher than the previous year. At the same time, non-petroleum, non-gems & jewellery imports (gold, silver & precious metals) saw a contraction of (-)3.5 per cent in FY24.



4.14 A decline in inflationary pressures in advanced economies has led to an increase in global demand for exports in the first two months of FY25. Accordingly, India's merchandise exports rose to USD 73.1 billion during April-May 2024 from USD 69.6 billion in the corresponding period of the previous year.



¹⁷ Classification of commodities at the 6-digit HS level has been taken from 'Standard Product Groups' from World Integrated Trade Solution (WITS) and 'Broad Economic Categories (BEC Revision 5)' from the United Nations Statistics Division (UNSD). Some unclassified commodities have been categorised based on the nature of similar product groups. On aggregate, the classified commodities cover 99.9 per cent of the export basket and 99.8 per cent of the import basket in both FY23 & FY24

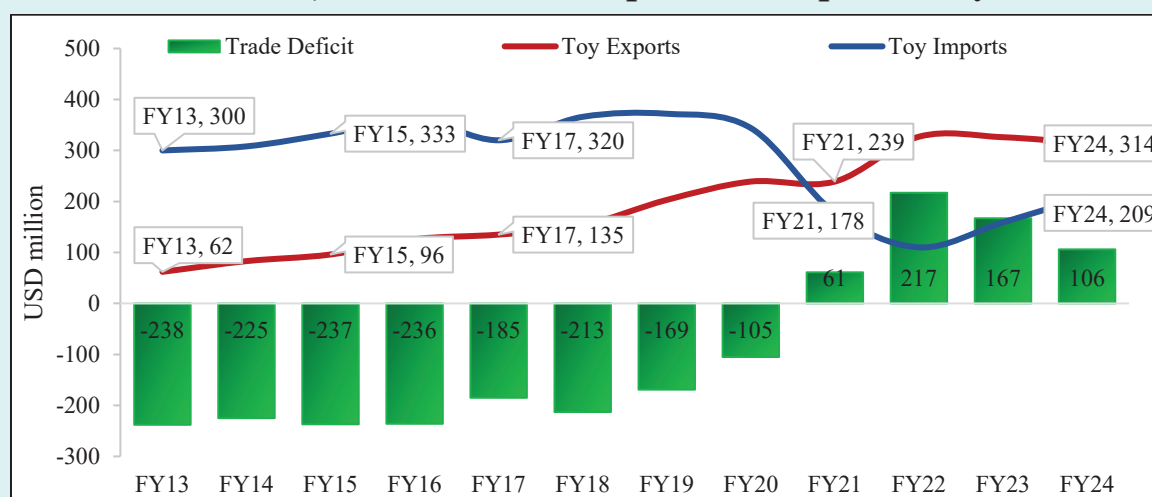
4.15 From FY23 to FY24, there appears to be a shift in the composition of exports across various classifications. Notably, the share of capital goods in merchandise exports rose substantially from 16.3 per cent in FY23 to 18.9 per cent in FY24. This increase suggests India's improved supplies of machinery, equipment, and other durable goods used in production processes, reflecting potential expansions or upgrades in its industrial capacities. Conversely, the share of consumer goods in merchandise exports declined slightly from 48.9 per cent in FY23 to 47.5 per cent in FY24, indicating a marginal dip in the export of finished products intended for direct consumption. The share of intermediate goods also declined from 30.2 per cent to 28.4 per cent.

Box IV.1: Product specific success stories of boosting exports

A series of measures undertaken by the Government have shown a remarkable increase in product-specific exports. Some of the success stories are mentioned below: -

Toy Exports: India's toy industry has long faced challenges in the global trade landscape, consistently being a net importer of toys for many years. However, the industry's exports experienced notable growth in 2023. As per the Directorate General of Commerce Intelligence and Statistics (DGCI&S) data, India's toy exports have shown a rising trend, registering a Compound Annual Growth Rate (CAGR) of 15.9 per cent between FY13 and FY24.¹⁸ Rising exports, coupled with declining imports, transformed India from a deficit to a surplus nation in the trade of toys. For over a decade, India heavily relied on China for around 76 per cent of its toy imports. India's import bill for toys from China dropped from USD 214 million in FY13 to USD 41.6 million in FY24, leading to a decline in China's share in India's toy imports from 94 per cent in FY13 to 64 per cent in FY24,¹⁹ indicating India's competitiveness in the international toy market.

Chart IV.7: Trend in India's exports and imports of toys



Source: Export Import Data Bank (Annual), Trade Statistics, Ministry of Commerce and Industry

¹⁸ Trade data is reported for HS Codes 9503, 9504 and 9505

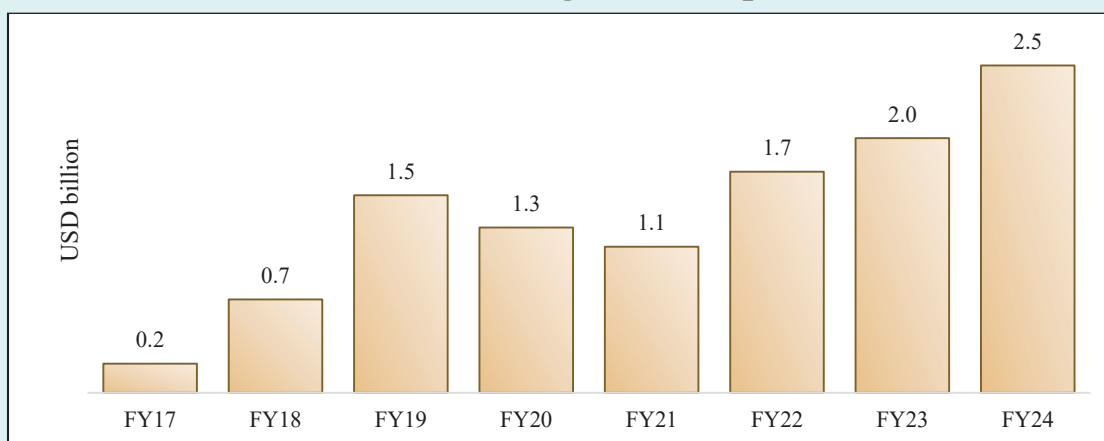
¹⁹ Trade data is reported for HS Code 9503, as it accounts for more than 80 per cent of toys imports from China

Over the period 2014 to 2020, focused efforts by the Government resulted in the number of manufacturing units doubling, dependence on imported inputs reducing from 33 per cent to 12 per cent, the gross sales value growing by a CAGR of 10 per cent, and an overall rise in labour productivity.²⁰

The measures taken by the Government for the toy industry include the formulation of a comprehensive National Action Plan for Toys with 21 specific action points, an increase in basic customs duty on toys, sample testing of each import consignment by the Directorate General of Foreign Trade (DGFT) to curb sub-standard imports, issuance of a Quality Control Order for toys, and support through cluster-based approaches. India's emergence as a toy exporting nation can be further attributed to its integration into the global toy value chain and zero-duty market access for domestically manufactured toys in critical countries such as the UAE and Australia.²¹

Defence Exports: India's defence production grew substantially from ₹74,054 crore in FY17 to ₹108,684 crore in FY23, boosting defence exports.²² Between 2015 and 2019, India held the distinction of being the world's second-largest arms importer. The narrative, however, has changed. India has transitioned from an arms importer and found a place in the list of the top 25 arms exporter nations. The defence industry, including the private sector and Defence Public Sector Undertakings (DPSUs), has made tremendous efforts to achieve the highest-ever defence exports. In addition, there has been a rise in the number of export authorisations issued to the defence exporters. From 1,414 export authorisations in FY23, the number has increased to 1,507 in FY24. About 100 domestic companies are exporting a wide range of defence products and equipment such as aircraft like Dornier-228, artillery guns, Brahmos Missiles, PINAKA rockets and launchers, radars, simulators, and armoured vehicles.

Chart IV.8: Rising defence exports



Source: Ministry of Defence

²⁰ PIB release of Department of Commerce dated January 4, 2024, <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1993109>

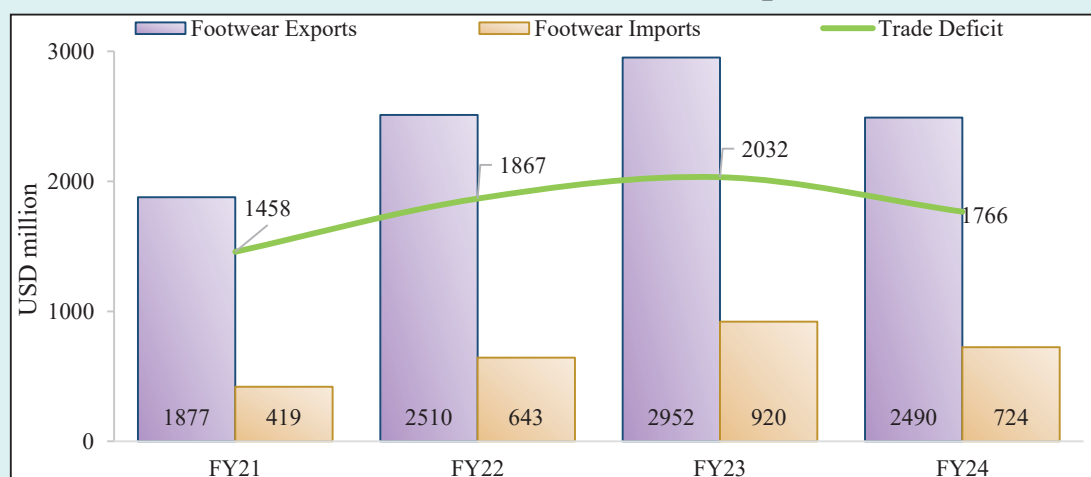
²¹ Ibid.

²² PIB release of Ministry of Defence dated 24 February 2024, <https://pib.gov.in/PressReleasePage.aspx?PRID=2008632>

To give a push to defence exports, the Government has taken several policy initiatives over the past ten years. Export procedures have been simplified and made industry-friendly, with end-to-end online export authorisation curtailing delays and facilitating ease of doing business. Further, the Aatmanirbhar Bharat initiatives have helped the country by encouraging indigenous design, development and manufacture of defence equipment, thereby reducing dependency on imports in the long run.

Footwear Exports: The Indian footwear and leather industry is an important foreign exchange earner. India is the second-largest global producer of footwear after China, accounting for 13 per cent of global footwear production and 2.2 per cent of global exports. India is the ninth-largest global footwear exporter.²³ As per DGCIS, India's footwear exports have increased from USD 1.9 billion in FY21 to USD 2.5 billion in FY24.²⁴

Chart IV.9: Trend in footwear exports



Source: Export Import Data Bank (Annual), Trade Statistics, Ministry of Commerce and Industry

The Government has undertaken various measures to boost footwear exports. These include the issuance of three Quality Control Orders for the footwear and leather sector after consultation with the Bureau of Indian Standards, relaxation in the creation of testing facilities by allowing outsourcing of the majority of the tests which are carried out less frequently, creating awareness amongst footwear manufacturers of footwear across India, among others. The Government has approved the continuation of the 'Indian Footwear and Leather Development Programme' till 31 March 2026. The leather and footwear sector can avail benefits of export promotion schemes under the Foreign Trade Policy 2023 and other benefits provided under the Market Access Initiatives Scheme, Trade Infrastructure for Export Schem, Interest Equalisation Scheme, etc.²⁵ The Indian footwear market, valued at USD 26 billion, is expected to reach USD 90 billion by 2030. This growth will be driven by increased non-leather footwear demand and a possible shift in leather shoe production

23 A GTRI report, 'India's Footwear Revolution: Marching towards a \$90 billion Future', <https://tinyurl.com/yvzbzadwr>.

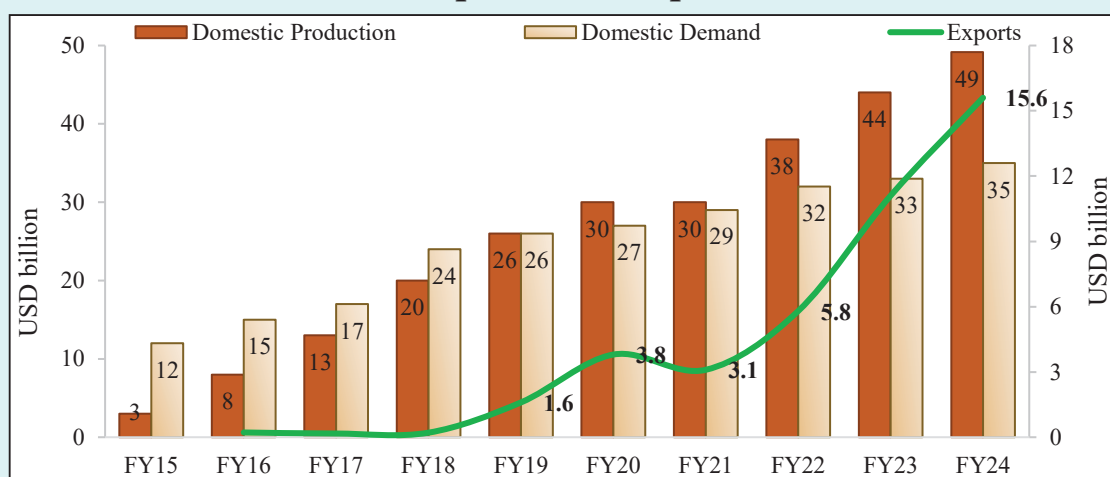
24 HS Code-6401, 6402, 6403, 6404, 6405 and 6406

25 DPIIT Rajya Sabha Unstarred Question 1818 answered on 4 August 2023, <https://tinyurl.com/yumj98fb>

from small-scale cottage industries to large corporates.²⁶ Changing market dynamics, mainly fuelled by evolving shopping habits, rapid urbanisation, greater brand awareness, the development of retail precincts/malls, and rising discretionary budgets, are contributing to this trend.

Smartphone exports: India's domestic production and exports of smartphones have been increasing steadily, with significant changes achieved, especially since the launch of the Production Linked Incentive (PLI) scheme in 2020. FY20 marked the first-time domestic production exceeded domestic demand, and smartphones became one of India's top export categories. Exports now provide the primary stimulus for the growth of the sector. A 42.2 per cent increase in exports in FY24 (on a YoY basis) enabled smartphones to rank among India's top five export items considered at six-digit HS product categories.²⁷

Chart IV.10: Rising domestic production, domestic demand and exports of smartphones



Source: ICEA, Export Import Data Bank (Annual), Trade Statistics, Ministry of Commerce and Industry

India also became the world's sixth-largest smartphone exporter in 2022, from the 23rd-largest smartphone exporter in 2014.²⁸ This high export growth has led to an increase in the ratio of exports to production, with exports being above 31 per cent of the total output of smartphones in India in FY24.

4.16 India is adding more export destinations, signalling regional diversification of exports. Calculations based on DGCIS data reveal that the share of the top 10 countries in India's merchandise exports has registered a declining trend, falling from a high of 61.9 per cent in FY2000 to 50.5 per cent in FY24. Further, the Regional Herfindahl Index (an estimate of the concentration of exports across countries)²⁹ for the top 10 countries declined from 0.071 in FY2000 to 0.046 in FY24.

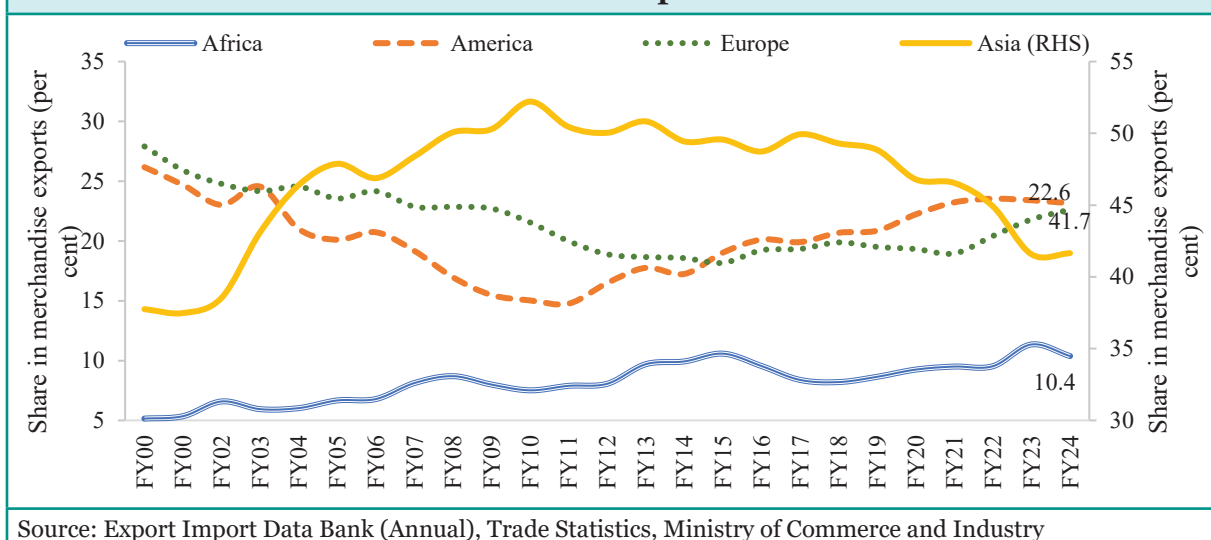
²⁶ Global Trade Research Institute (GTRI) report dated 7 January 2024-India's Footwear Revolution: Marching Towards a USD 90 Billion Future, <https://tinyurl.com/bd7rdub5>

²⁷ (HS 6 Code-851713)-Smartphones

²⁸ As per the latest data available on ITC Trade Map

²⁹ Regional/Sectoral Herfindahl Index (RHI) = $\sum Si^2$, where Si refers to the share of Country/Region 'i' in India's export basket in case of regional diversification

Chart IV.11: India's export destination



4.17 Post-FY2000, Asian, African and Middle Eastern nations, such as the UAE, Singapore, Hong Kong, and China, have emerged as export destinations, replacing traditional export partners like the UK, Germany, Belgium, etc. The combined share of the developing regions viz. Asia and Africa in India's total exports rose from around 42.9 per cent in FY2000 to 52 per cent in FY24. In FY24, UAE, Singapore, China, Russia, and Australia emerged as India's major export partners.

Sectoral trends

4.18 A bifurcation of merchandise exports into POL and non-POL products shows that exports across both categories have declined in FY24. The fall in POL exports can be attributed mainly to a decline in global petroleum product prices. Even though the volume of POL exports increased from 99 million tonnes in FY23 to 108 million tonnes in FY24, the value of exports declined by 13.7 per cent, from USD 97.5 billion to USD 84.2 billion during the same period. However, in the last six years, POL exports increased by 80.8 per cent from USD 46.6 billion in FY19 to USD 84.2 billion in FY24, with the share in global POL exports (HS 2710 to 2713) exports rising from 4.3 per cent in 2018 to 4.8 per cent in 2022.³⁰

4.19 Under non-POL products, exports of engineering goods, electronic goods and drugs & pharmaceuticals increased in FY24 on a YoY basis. In contrast, agriculture and allied products, chemicals, plastics and textiles have witnessed a decline in exports. Over the past six years, the composition of exports across these categories has changed. Engineering goods dominated the merchandise exports in FY19, accounting for 25.3 per cent of the total exports. This trend remained the same, with engineering goods exports reaching USD 109.3 billion in FY24, with the share being the same at 25 per cent. Agri and allied products also maintained a steady

³⁰ Based on the ITC Trade Map

share. From USD 36.6 billion in FY19, their exports peaked at USD 52.7 billion in FY23 before slightly declining to USD 48.3 billion in FY24, holding around 11 per cent share in merchandise exports. Chemical and plastic exports experienced notable growth, rising from USD 31 billion in FY19 to USD 37.5 billion in FY24. Despite this increase in value, their share declined from 9.4 per cent in FY19 to 8.6 per cent in FY24. The textile sector witnessed a relative decline in prominence. Along with a decline in their exports from USD 37.5 billion in FY19 to USD 34.8 billion in FY24, their share in total exports also dropped significantly from 11.4 per cent to 8 per cent during the same period. This reduction, apart from reflecting the shifting priorities and emerging sectors within India's export framework, is also likely reflective of underlying challenges in the sector that need addressing.

4.20 India's share in world electronics exports (captured by incorporating HS chapters 84, 85, and 90) has improved from 0.63 per cent in 2018 to 0.88 per cent in 2022³¹. As such, India's rose from 28th in 2018 to 24th in 2022 in global electronics exports. The share of electronics goods in merchandise exports of India rose from 2.7 per cent in FY19 to 6.7 per cent in FY24.

4.21 India maintained a strong foothold in the drugs and pharmaceuticals sector. The share of the sector in India's exports grew from 5.8 per cent in FY19 to 6.4 per cent in FY24, with exports rising from USD 19.1 billion in FY19 to USD 27.9 billion in FY24.

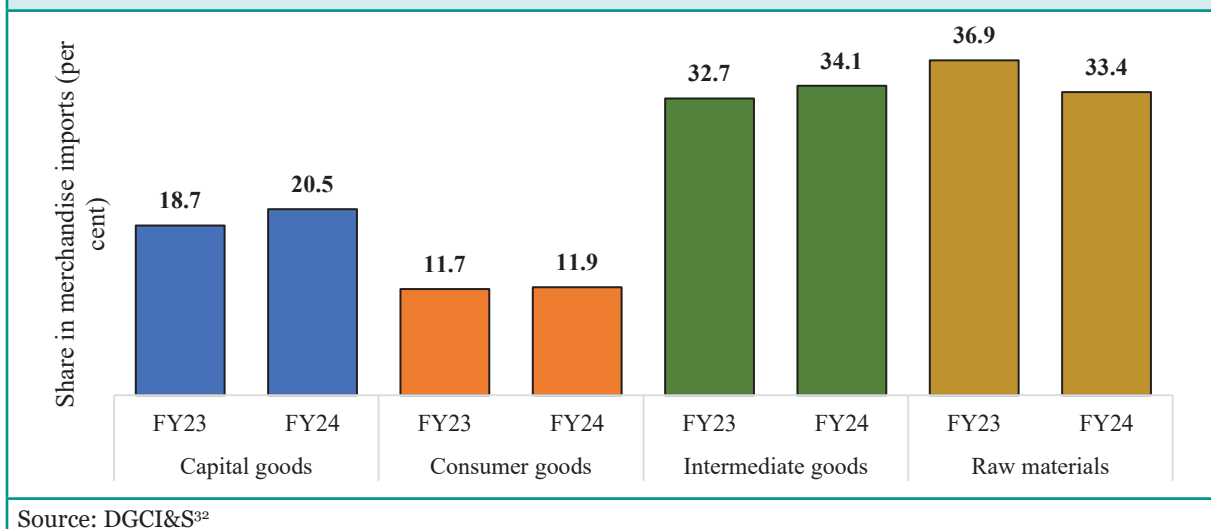
Merchandise imports

4.22 Despite high domestic demand due to the relatively strong growth of India's economy, merchandise imports contracted by 5.7 per cent in FY24, from USD 716 billion in FY23 to USD 675.4 billion in FY24. The moderation in merchandise imports was primarily driven by petroleum, crude and products, fertilisers, pearls, precious and semi-precious stones, organic and inorganic chemicals, and textile yarn fabric, among others. Owing to a rise in domestic demand, merchandise imports rose from USD 106.5 billion during April-May 2023 to USD 116 billion during April-May 2024.

4.23 Several important shifts in the composition of imports between FY23 and FY24 could be seen. Imports of capital goods saw an increase, which is welcome as it indicates a heightened demand for machinery, equipment, and other durable goods used in production processes, suggesting potential investments in industrial infrastructure or technological upgrades. A marginal uptick in the share of consumer goods in merchandise imports reflects a stable but limited increase in the importation of finished products for direct consumption. The share of intermediate goods in merchandise imports also slightly rose in FY24, reflecting a continued need for semi-finished products, components, or materials used in further manufacturing processes.

³¹ Based on the ITC trade Map

Chart IV.12: Composition of merchandise imports across various classifications



Services as a shining star in exports

4.24 India's services export in US Dollars terms expanded at a robust CAGR of more than 14 per cent over the last 30 years (between 1993 and 2022), significantly higher than India's merchandise export growth (10.7 per cent) and world services export growth (6.8 per cent). Accordingly, the share of India's services exports in world services exports has risen remarkably from 0.5 per cent in 1993 to 4.3 per cent in 2022. India is now the seventh-largest services exporting country globally, with a phenomenal rise from its 24th position in 2001. India ranks 2nd in the world in telecommunication, computer, and information services exports, 6th in personal, cultural and recreational services exports, 8th in other business services exports, 10th in transport services exports, and 14th in travel services exports. As noted by the RBI, healthy and steady growth in services exports has imparted strength to India's BoP position by offsetting a significant part of the country's merchandise trade deficit.³³

4.25 India's deep integration into the value chains of the global software industry has led to a change in the composition of its services exports basket. While the early 2000s was a period of business process outsourcing (BPOs) that provided cost-cutting back-end IT services, India now looks beyond such services. Data from the Asian Development Bank (ADB) shows that India went from providing back-end services in law, IT, and management in 2010 to providing upstream and high-value-added services in these fields by 2020.³⁴ The Russia-Ukraine conflict and global inflation pressured wages encouraged global players to look towards India to set up their back-office operations to balance their cost model. This gave rise to a sudden proliferation of the Global Capability Centres (GCCs). The growth in GCCs is reflected in the services BoP, with 'Other Business Services' being the second-largest contributor in services exports in FY24 (26 per cent), after IT services (48 per cent). The rising contribution of other business services

³² Ibid footnote 17

³³ 'What drives India's Services Exports?' RBI Bulletin dated 22 April 2024, <https://tinyurl.com/4vjerjex>

³⁴ Asian Infrastructure Finance 2021, 'Sustaining Global Value Chains', <https://tinyurl.com/yfzj6tkm>

to overall services exports is shown by their achieving a CAGR of 18 per cent between FY20 and FY24. The share of software exports in overall services exports declined from 50 per cent in FY21 to 48 per cent in FY24.³⁵ Box IV.2 discusses the growth of GCCs in India in some detail.

Chart IV.13: Remarkable performance of India's services trade in the last ten years

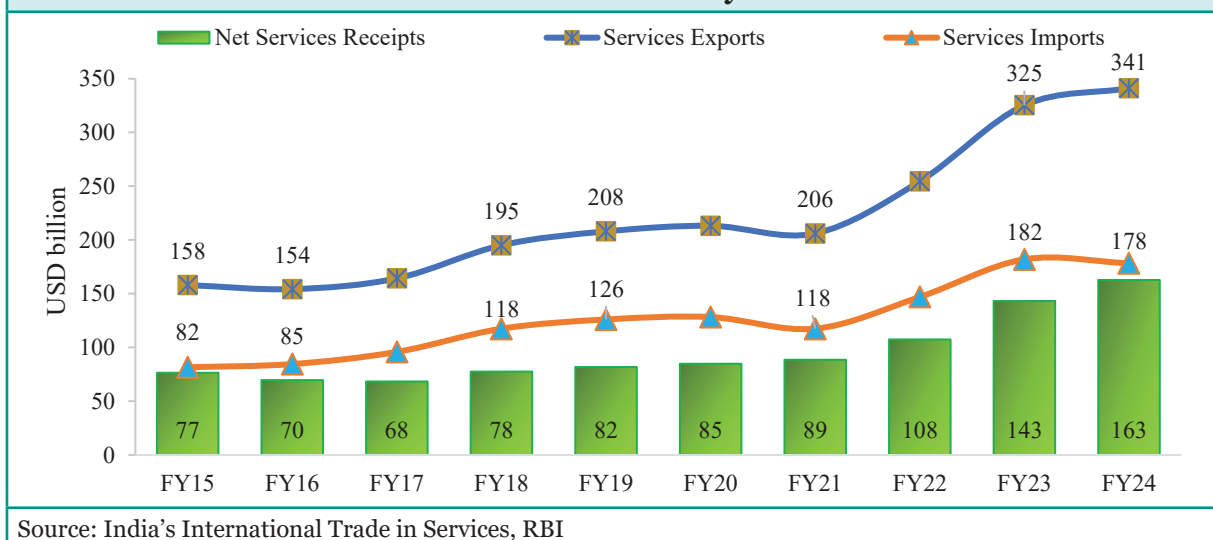


Table IV.2: Resilient performance of service trade (Values in USD billion)

Sectors	FY23		FY24	
	Exports	Imports	Exports	Imports
Total services	325.3	182.0	341.1	178.3
Manufacturing services on physical inputs owned by others	1.5	0.2	1.4	0.1
Maintenance and repair services n.i.e.	0.2	1.9	0.2	1.5
Transport	36.1	40.6	29.2	29.3
Travel	27.0	28.4	33.7	33.7
Construction	3.8	2.8	4.6	2.8
Insurance and pension services	3.3	2.3	3.3	2.9
Financial services	7.8	5.7	8.1	4.6
Charges for the use of intellectual property n.i.e.	1.3	10.6	1.6	15.0
Telecommunications, computer, and information services	152.3	19.8	163.6	20.9
Other business services	80.4	59.7	88.6	59.3
Personal, cultural, and recreational services	3.9	5.5	4.4	6.3
Government goods and services n.i.e.	0.7	1.0	0.6	1.1
Others n.i.e.	7.1	3.4	1.8	0.8

Source: Statistics, India's Overall Balance of Payments-US Dollars, RBI

Note: P stands for Provisional

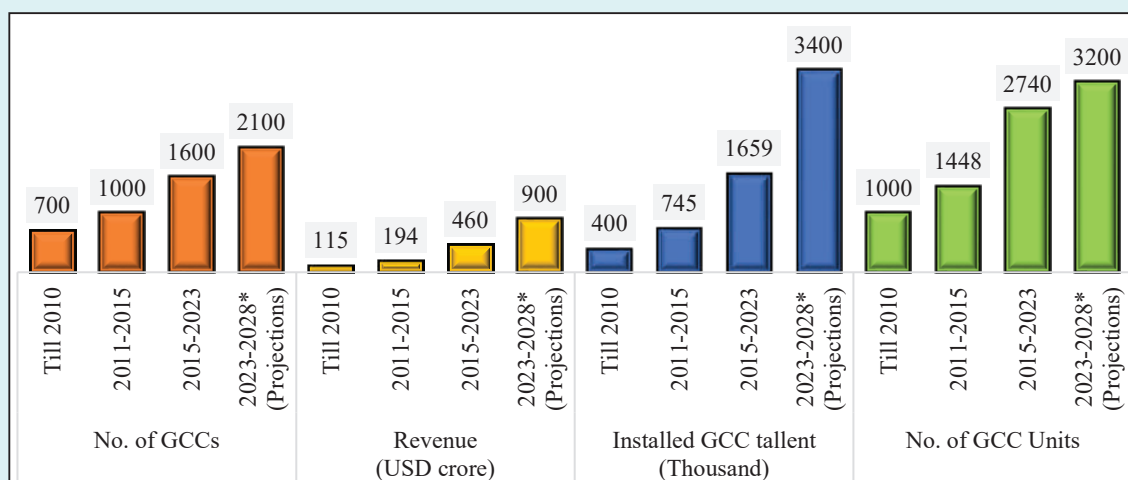
³⁵ Based on RBI's quarterly Balance of Payments (BoP) data

Box IV.2: Journey of Global Capability Centres in India

Origin of GCCs: In the last couple of years, more than 150 multinationals have set up their GCCs in India.³⁶ Starting with the humble beginning of offshoring by Texas Instruments by setting up its office in Bengaluru in 1985, India has come a long way to being at the epicentre of GCC growth.³⁷ In the 1990s, other companies followed suit, and many airlines and technology companies started their operations in India. These were called ‘captive centres’ earlier and have now come to be addressed as GICs (global in-house centres) or GCCs. In 2012, about 760 GCCs were operating out of India. In 2016, that number went over 1000, and as of March 2023, India houses over 1,600 GCCs.

Various agencies have projected that the number of GCCs would grow in the coming years, creating jobs as well. According to a PwC report, by 2028, the country is poised to have 2100 GCCs, with the market size of the centres touching USD 90 billion.³⁸ As per a study by Wizmatic³⁹, GCCs presently employ 32 lakh people, primarily engineers and scientists. They generated a combined revenue of USD 46 billion in 2023 and are estimated to generate a total revenue of USD 121 billion by 2030, roughly 3.5 per cent of India’s GDP. Out of this, USD 102 billion will represent export earnings.

Chart IV.14: Remarkable growth of GCCs in India



Source: PwC report ‘Six imperatives to scale up the global capability centre market in India’

Role of GCCs: GCCs provide bespoke services in operation, product development and innovation. Today, GCCs operate across all IT, BPO, engineering, and software product development service lines, delivering complex work that requires a significant understanding of business context and imperatives. They have made a mark in key industry verticals such as banking and financial services, software, telecom and semiconductors, with a growing concentration in aerospace, automotive, oil and gas, healthcare and pharma.

36 June 2023: Nasscom and Zinnov: India Redefining Globalisation Blueprint. <https://tinyurl.com/3za5cj3j>

37 <https://tinyurl.com/mvcx8tdm>

38 PwC report ‘Six imperatives to scale up the global capability centre market in India’, <https://tinyurl.com/4ehuhu6m>

39 The Economist (23 May 2024), ‘Global firms are Tapping India’s Workers like never before’, <https://tinyurl.com/37psdw3s>

Government support for GCCs: Strategic interventions under various initiatives like ‘Digital India’ and policies for easing doing business have streamlined online approvals and licensing processes for GCCs. Initiatives like streamlined tax regulations and compliance procedures for foreign companies for setting up GCCs, flexible labour laws, and single-window clearance systems for faster approvals have eased the business process. Improved digital infrastructure (high-speed internet, data centres) has been a boon for GCC operations.

Various States are undertaking a multi-pronged approach to boost the GCC ecosystem by identifying high-potential industries. For example, State Governments of Karnataka, Telangana and Tamil Nadu have launched research and development (R&D) policies to expand the GCC landscape in sectors such as auto and electric vehicles, electronics, pharma and life sciences in the states. These policies aim to develop innovation hubs in the States by leveraging the existing industry presence and the academic and R&D ecosystem. For instance, Telangana contributes to over 30 per cent of India’s pharma production and is home to more than 1,000 life sciences companies and over 200 FDA-approved sites for producing innovative and generic medicines.⁴⁰ The Karnataka Digital Economy Mission (KDEM)⁴¹ aims to increase the State’s contribution to India’s digital economy to USD 300 billion by 2026 by enabling holistic growth of the tech sectors and start-ups by deepening partnerships with industry players and developing tech clusters beyond the State’s capital to achieve higher contribution. Consequently, leading technology companies have started operations in Mysuru, Mangalore and Hubballi clusters, generating employment for more than 5,000 people.

Partnership with Startups to support global technology needs: As per a NASSCOM report, GCCs are leveraging India’s vital engineering research and development service provider community, its mature start-ups, and its peer-GCC ecosystem. They have established more than 15 incubators, over 40 accelerators, and multiple partner programmes to drive collaboration with Indian start-ups.⁴² Healthcare and pharma GCCs have witnessed an increased partnership with start-ups and academia to access newer technology. The GCCs have explored various forms of collaboration, such as innovation labs, hackathons and start-up incubators.

Expansion to Tier-II cities: GCCs are increasingly evaluating tier-II towns to expand their operations, influenced by the reverse migration seen during the pandemic and the cost arbitrage offered by such relatively under-penetrated markets. The recent thrust on infrastructure development in these cities has also added to their appeal. As per a CBRE research report,⁴³ during H1 of 2023, about 22 per cent of GCC centres were set up in tier-II cities, driven by the availability of existing and fresh talent.

⁴⁰ Telangana Life Sciences: Vision 2023, <https://tinyurl.com/4ws4a3ub>

⁴¹ Karnataka Digital Economy Mission, <https://karnatakadigital.in/about-us/>

⁴² NASSCOM report dated 4 October 2021-Evolving GCC Ecosystem in India, <https://tinyurl.com/4y3zstj5>

⁴³ CBRE Research report dated November 2023-India’s Global Capability Centres: Charting A New Era, <https://tinyurl.com/4bmadaxy>

Rising global demand for India: While US and Europe-based MNCs have been establishing their capability centres for a long time, international players from the Asia Pacific region, especially Japan and South Korea, have begun setting up their R&D/innovation centres in India over the past few years. Although other countries with GCC presence have emerged recently, India remains a GCC favourite in a highly competitive global environment due to its ample talent endowment and cost advantage.

The way forward: Today, GCCs contribute to their parent organisations' success and propel India's economic growth. They account for more than 1 per cent of the country's GDP, and the share is expected to grow further.⁴⁴ As more global players eye India to set up their GCC operations, the government has a crucial role in facilitating their entry. Government support for identifying new business models for partnerships, simplifying the entry process, and emphasising trust and data security, among others, will further encourage the location of GCCs in India.

India's rising Global Value Chains (GVC) participation

4.26 GVCs refer to international production sharing, where operations are spread across national borders (instead of being confined to the exact location), producing a complex product. In what has come to be called a period of 'hyperglobalisation'⁴⁵, the early 2000s saw rapid GVC expansion worldwide. This led to exponential gains in trade, reductions in supply chain costs and deep interlinkages in trade across nations. A dramatic shift from "hyperglobalisation" to "slowbalisation"⁴⁶ occurred following the 2008 global financial crisis (GFC). Concerns about the risks and uncertainties surrounding GVCs were further amplified with shocks such as the China-USA trade war, the COVID-19 pandemic, and the Russia-Ukraine conflict. More recently, this trend has begun to see a reversal. WTO's GVC Development Report 2023⁴⁷ showcases recovery in GVCs, underscored by a rise in the share of foreign export inputs and enhanced participation rates of economies worldwide.

4.27 In line with the global trend, India's GVC participation rose steadily through the 1990s and 2000s before the GFC, after which it started declining. For instance, the foreign value-added content of India's exports rose from 10 per cent in 1995 to 22 per cent in 2009 (the second highest amongst BRICS nations, after China), reflecting increased fragmentation of production and integration into GVCs.⁴⁸ After the lull seen in the years succeeding the global financial crisis, India's GVC participation has begun to rev up again on the back of incentives provided through schemes such as the PLI and Districts as Exports Hub (DEH) initiative. Box IV.3 discusses

44 SCMP Plus blog on 'India's rise as 'world's back office' in spotlight as service sector booms', <https://tinyurl.com/3b4wex69>

45 Subramanian, A., et.al (2023). Trade hyperglobalization is dead. Long live? Peterson Institute for International Economics Working Paper, (23-11). <https://www.piie.com/sites/default/files/2023-11/wp23-11.pdf>

46 Kononenko, V., et.al (2020). Slowing down or changing track? Understanding the dynamics of Slowbalisation', <https://tinyurl.com/j43864ja>

47 https://www.wto.org/english/res_e/publications_e/gvc_dev_rep23_e.htm

48 OECD India Policy Brief dated November 2014, <https://www.oecd.org/india/India-Enhancing-Global-Value-Chain-Participation.pdf>.

in detail the trend in India’s GVC participation and change in sectoral composition. Box IV.4 highlights the success stories of DEH.

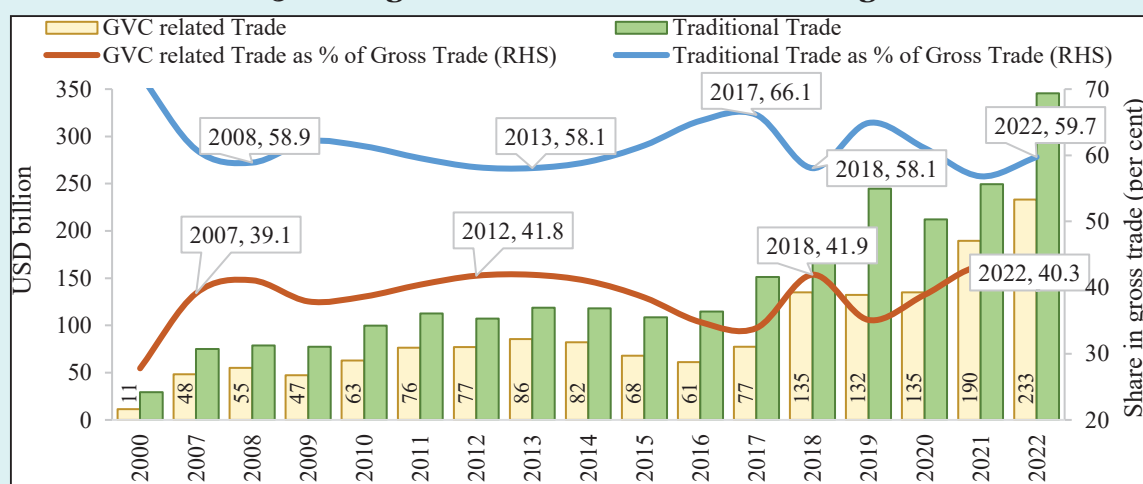
4.28 The evidence of India’s enhanced global supply chain participation is reflected in increased investment by foreign firms in electronics, apparel and toys, automobiles and components, capital goods and semiconductor manufacturing in India. India’s large domestic consumer market is an added attraction for firms setting up shop here. For example, Apple assembled 14 per cent of its global iPhones in India in FY24. Foxconn invested in the states of Karnataka and Tamil Nadu to set up new manufacturing plants for components.

4.29 Asia is the primary beneficiary of shifting supply chains. India has received the most interest from firms (28 out of 130 firms) regarding setting up or expanding production facilities, followed by Vietnam, Mexico, Thailand, Malaysia and Indonesia.⁴⁹

Box IV.3: The trend in India’s GVC participation and change in the sectoral composition

The WTO’s World Integrated Trade Solutions (WITS) database shows that India’s GVC-related trade⁵⁰ increased nearly four times from USD 62.9 billion in 2010 to USD 233.1 billion in 2022. Essential products driving India’s GVC participation include coal and petroleum, business services, chemicals, and transport equipment. India’s GVC trade grew at a CAGR of 14.6 per cent between 2018 and 2022. This is higher than the CAGR of 13.3 per cent between 2014 and 2018 and 6.9 per cent between 2010 and 2014.

Chart IV.15: Rising share of GVC-related trade in gross trade⁵¹



Source: WTO WITS database

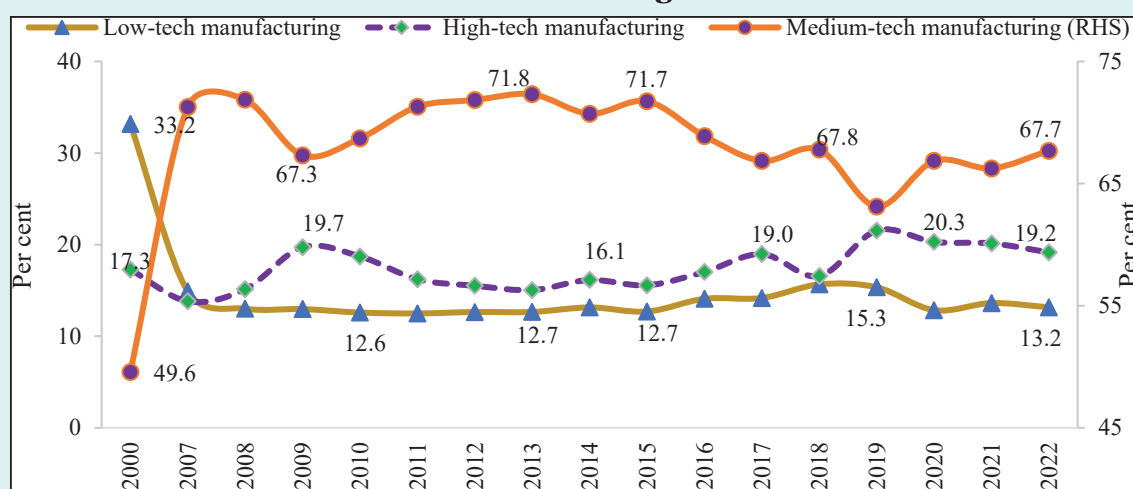
49 Nomura Global Market Research 28 May 2024, ‘Asia’s new flying geese’

50 According to the WITS database, GVC-related trade refers to the value of the trade which crosses more than one border, <https://wits.worldbank.org/gvc/gvc-output-table.html>

51 Gross trade is the sum of GVC-related trade and traditional trade. Traditional trade refers to the trade which crosses the border only once.

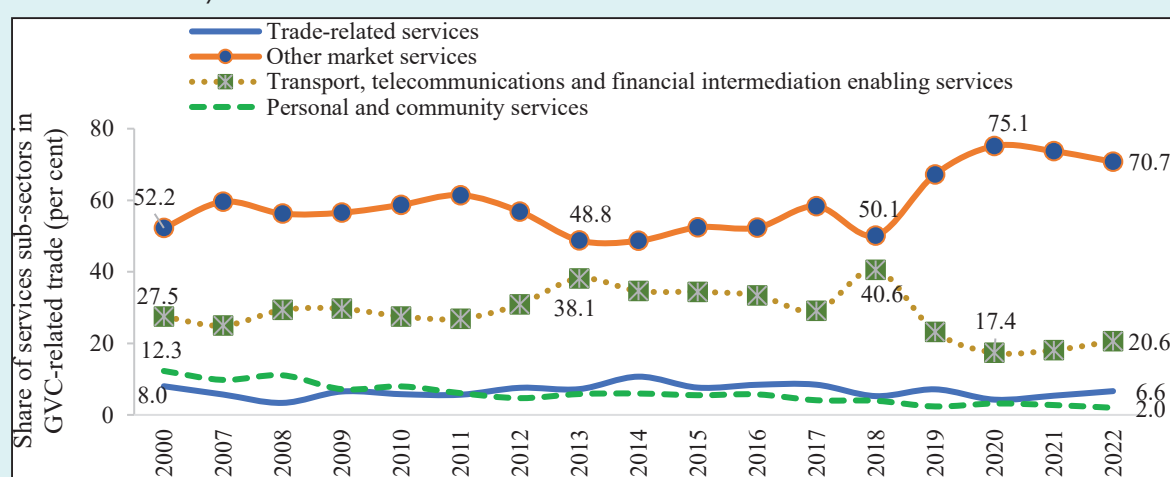
Over the years, the sectoral composition of India's GVC-related trade has changed markedly. Within the manufacturing sector, the share of low-technology manufacturing⁵² has declined over the years, while the share of medium⁵³ and high-technology manufacturing⁵⁴ has been rising. The increase in medium technology manufacturing can also be seen in the shift toward industries such as coke and petroleum, transport equipment and primary and fabricated metals, which have a significant share in India's GVC-related trade.

Chart IV.16: Share of different manufacturing sub-sectors in GVC-related trade



Source: WTO WITS database

Chart IV.17: Share of different services sub-sectors in GVC-related trade



Source: WTO WITS database

Exports of IT and technology-enabled services lead India's GVC services exports. Further, GVC participation in services has gradually matured from low-value-added business process

⁵² Low-technology manufacturing includes food, beverages and tobacco; textiles and textile products; leather, leather products and footwear; wood and products of wood and cork and pulp; paper, paper products; printing and publishing

⁵³ Medium-technology manufacturing includes coke, refined petroleum and nuclear fuel, chemicals and chemical products, rubber and plastics, other non-metallic minerals, basic metals and fabricated metal and machinery.

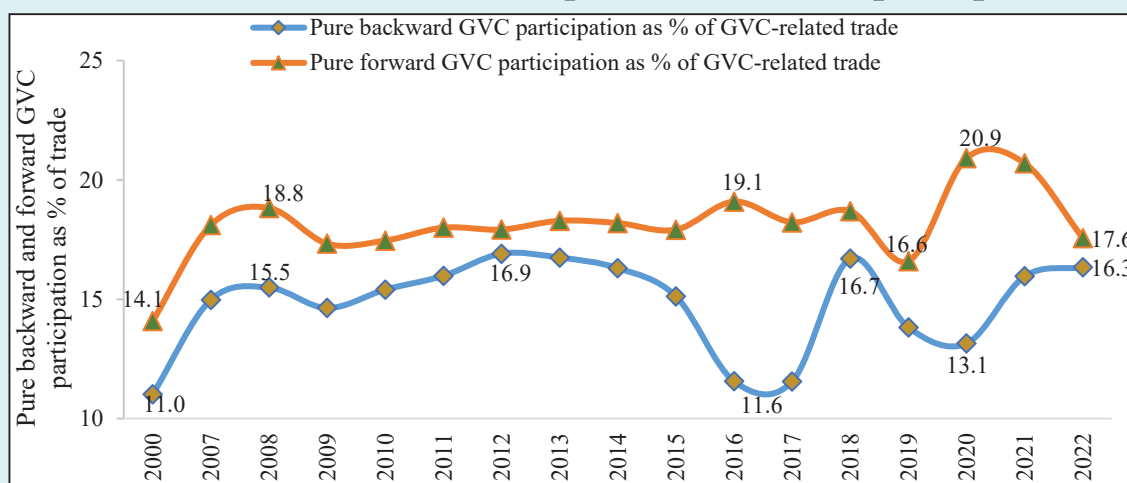
⁵⁴ High-technology manufacturing includes electrical and optical equipment, transport equipment and manufacturing, nec, and recycling.

outsourcing (BPO) services to high-value-added services, such as those provided by global capability centres (GCCs).

Previously, India's GVCs involved a higher level of forward participation, which resulted in lower value-addition for exports within the country. However, in recent years, India has begun to move downstream and export finished goods to the rest of the world.⁵⁵ This can be seen in the rise in the share of pure backward GVC participation from 13.8 per cent in 2019 to 16.3 per cent in 2022. Sectors such as food and beverages, electrical and optical equipment, and financial intermediation, among others, have witnessed a remarkable increase in backward GVC participation. Even by stricter estimation, i.e., excluding coke, refined petroleum and nuclear fuel, the share of pure backward participation in gross trade increased from 12.1 per cent in 2019 to 14 per cent in 2022. In contrast, the share of pure forward GVC participation (or upstream participation) in trade has declined from 19.1 per cent in 2016 to 17.6 per cent in 2022 in sectors such as retail trade, coke, refined and nuclear fuel, chemicals and primary and fabricated metals, among others.

Rising backward GVC participation bodes well for India. The latest research by Professor Veeramani and Dhir⁵⁶ shows that greater backward GVC participation results in higher absolute levels of gross exports, domestic value-added, and employment.

Chart IV.18: Rise in the share of pure backward GVC participation



Source: WTO WITS database

Despite so much progress, India's GVC participation (GVC-related trade as per cent of gross trade at 40.3 per cent in 2022) is still lower not only in comparison to large economies such as the USA (43.7 per cent), UK (47.8 per cent) and Japan (46.6 per cent), but also its Asian counterparts, such as South Korea (56.2 per cent) and Malaysia (60 per cent). To further embrace

⁵⁵ Forward participation of a country refers to producing and shipping raw materials and intermediate inputs (for example, yarn) for further processing and exporting by other countries (fabric). In contrast, backward participation refers to using imported intermediate inputs (imported fabrics) to produce goods that are exported (apparel).

⁵⁶ Veeramani, C., & Dhir, G. (2022). Do developing countries gain by participating in global value chains? Evidence from India. *Review of World Economics*, 158(4), 1011-1042, <https://shorturl.at/jixnb>

GVCs and enhance participation, there is a need to develop quality trade infrastructure, integrate micro, small and medium enterprises in the GVC network, simplify procedures for entry and exit of small businesses, and work towards trade facilitation measures.

Finally, it is worth noting that India's GVC expansion is taking place in an era that is not particularly conducive to GVCs. Countries worldwide are embracing mercantilism. Nonetheless, despite the rise in mercantilism, there is scope for collective country blocs to trade intensively with one another. In this context, GVCs can help build self-reliance and promote shared trade gains amongst these country blocs.

Box IV.4: Indian Districts as Export Hubs

Each district in the country holds economic potential comparable to that of a small country. They can become export hubs using their unique identities and prospects in the global marketplace. To take this forward, the Districts as Export Hubs (DEH) initiative was launched in August 2019 to foster balanced regional development across all districts of the country. The objective was to select, brand, and promote the sale of products from each district in the domestic and international markets. Through the DEH initiative, the Government aims to boost manufacturing and exports from urban areas while focusing on generating interest and economic activity in the rural hinterland. India's Foreign Trade Policy 2023 reiterated the role of DEH in India's export efforts.

As part of its recent initiative under DEH - Focus @ 75 initiative, the Government has identified 75 districts across India to provide targeted support for boosting exports. Key events include Vanijya Saptah, a series of workshops aimed at educating and empowering local exporters, and participation in the Dubai Expo 2020, where Indian products were showcased to a global audience. A notable success of the expo is the introduction of Ladakh's apricots to Dubai supermarkets. Additionally, the Marine Buyer-Seller Meet connected Indian marine product exporters with international buyers, while marketing and branding workshops helped exporters enhance their product presentation.

The DEH initiative provides a broad base to promote financial inclusion and facilitate logistical and infrastructural support to engage all districts of the country in developing at least a commodity for the global market and thus promoting exports. The bottom-up approach helps India establish a direct link between production units and meet national export obligations.

All States/UTs have established an institutional mechanism by constituting State Export Promotion Committees (SEPC) and District Export Promotion Committees (DEPC). District Export Action Plans have been prepared and updated from time to time by the DEPCs to identify bottlenecks and necessary interventions to support exporters and manufacturers in promoting the export of identified products/services. So far, 567 Districts have prepared

their Export Action Plans (DEAPs). Districts have identified 304 unique products spanning across 13 sectors across the country. Notably, 14 out of these 304 unique products have been identified as services strategically distributed across over 100 districts.

The Government is also promoting e-commerce exports through its DEH initiative, collaborating with relevant e-commerce partners, Export Promotion Councils, and relevant Government departments. The initiative focuses on educating MSMEs about e-commerce exports, enabling them to sell globally, and includes training and handholding on imaging and digital cataloguing of products. As a result of these collaborations, 10 outreach events were organised in Districts export outreach events in Faridabad, Moradabad, Ludhiana, Jodhpur, Bangalore, Ahmedabad, Hyderabad, Mumbai, Jamshedpur, and Varanasi during the first quarter of 2024. These events, organised with leading e-commerce partners, provided valuable hand-holding, capacity-building, and training sessions for participating businesses, offering key insights and support to help them succeed in global markets.

The Government is taking further steps to enhance the performance of the scheme. For instance, the Directorate General of Foreign Trade (DGFT) has partnered with Exim Bank to boost exports under the ODOP (One District, One Product) and DEH initiative. This collaboration stems from an Exim Bank study that identified 59 middle export districts with export potential. Under the collaboration, the DGFT will be working with Exim Bank in 20 districts. These districts will receive support through Exim Bank's GRID program (Grassroots Initiatives for Development). The program aims to address sector-specific challenges and identify suitable beneficiaries for support. Exim Bank aims to prepare a detailed proposal outlining challenges and solutions for collaborative implementation.

Changing landscape of India's global trade arrangements

4.30 Global economic growth and international trade are passing through a particularly challenging phase of uncertainty, as detailed in paras 4.4 to 4.8 above. In this context, open, inclusive, predictable, non-discriminatory, and mutually beneficial trade can provide an impetus to economic growth. India advocates for a rule-based international trading system with these attributes with WTO at its core. In this spirit, India considers Free Trade Agreements (FTAs) an instrument of trade liberalisation and a complement to the multilateral trading system under WTO. Accordingly, the country has engaged with its trading partners/blocs to expand its export markets while ensuring better terms for essential imports to meet domestic demand in a cost-competitive manner.

4.31 After a gap of nearly 10 years, four new FTAs have been signed over the period 2021 to 2024.⁵⁷ These FTAs are with Mauritius (signed in February 2021), the UAE (February 2022), Australia (April 2022) and the European Free Trade Association or EFTA (March 2024). All

⁵⁷ Before 2021, the last FTA signed was with Japan in February 2011, which came into force in August 2011.

these FTAs have come into force except the last one. Having signed FTAs with most East-Asian partners, these new trade engagements focus on gaining access to the Western and African markets, as well as potential partners having trade complementarity. India's young demography and growing middle-class population provide an attractive market for its Western FTA partners.

4.32 One of the major criteria for engaging with an FTA partner is to ensure that the trading partner is a natural partner in terms of trade complementarity. Academic literature on natural trading partners identifies factors that would promote robust trade between FTA partners and facilitate deeper economic integration. The initial trade volume, geographic proximity, and trade complementarity are prominent among them.⁵⁸

India-Mauritius CECPA

4.33 Since 2005, India has been among the largest trading partners of Mauritius. India's exports to Mauritius stood at USD 462.7 million in FY23, while Mauritius's exports to India were USD 91.8 million, taking the total trade to USD 554.5 million. Trade has grown by 168 per cent in the last 17 years, from FY06 to FY23. Petroleum products were the largest export item for India between 2007 and 2019 until the Mangalore Refinery and Petrochemicals Limited supply contract was terminated in mid-2019. Other Indian exports to Mauritius include pharmaceuticals, cereals, cotton, shrimps, prawns and bovine meat. Main Mauritian exports to India are vanilla, medical devices, needles, aluminium alloys, scrap paper, refined copper, men's cotton shirts, etc.⁵⁹

4.34 India and Mauritius signed the Comprehensive Economic Cooperation and Partnership Agreement (CECPA) in February 2021. The CECPA is the first trade Agreement signed by India with an African country. The agreement covers trade in goods, rules of origin, trade in services, Technical Barriers to Trade, Sanitary and Phytosanitary measures, etc. The Agreement covers 310 export items for India, including foodstuffs and beverages, agricultural products, etc. Mauritius benefits from preferential market access to India for its products such as frozen fish, speciality sugar, biscuits, fresh fruits, juices, mineral water, etc.

4.35 As regards trade in services, Indian service providers have access to around 115 sub-sectors from the 11 broad service sectors such as professional services, computer-related services, research & development, other business services, telecommunication, construction, distribution, education, environmental, financial, tourism & travel related, recreational, yoga, audio-visual services, and transport services. India has offered trade access to around 95 sub-sectors from 11 broad services sectors, including professional services, R&D, other business services, telecommunication, financial, distribution, higher education, environmental, health, tourism and travel-related, recreational, and transport services.⁶⁰

58 Kandogan, Y. (2008). Regionalism versus Multilateralism: Evidence for the Natural Trade Partners Theory from the Euro-Mediterranean Region? *Journal of Economic Integration*, 23(1), 138–160, <https://www.jstor.org/stable/23001115>

59 India-Mauritius bilateral relations, https://www.mea.gov.in/Portal/ForeignRelation/Mauritius_2023.pdf

60 PIB press release of Ministry of Commerce and Industry dated 31 March 2021, <https://tinyurl.com/24cjb5sv>

India-UAE CEPA

4.36 The UAE can be classified as a natural trading partner, having been featured among India's top three trade partners for the past two decades. UAE has been India's largest export market for gems and jewellery, cereal, and fuel. Through the UAE CEPA (Comprehensive Economic Partnership Agreement), these labour-intensive products will receive preferential access.⁶¹

4.37 The bilateral trade between India and the UAE in FY24 was USD 83.7 billion. The UAE is India's second-largest export destination, with approximately USD 35.6 billion in exports in FY24. The UAE is also the eighth largest investor in India, with an estimated investment of USD 18 billion, whereas Indian investments in the UAE are estimated at around USD 85 billion⁶². The CEPA is expected to increase the bilateral trade in goods to USD 100 billion within five years of the signing and increase trade in services to USD 15 billion. The India-UAE CEPA is likely to benefit about USD 26 billion worth of Indian products that are subjected to 5 per cent import duty by the UAE. UAE can also become a hub for sourcing India's capital goods and intermediates for further value-added exports to other African and European destinations. Also, for the first time in any Trade Agreement, a separate Annex on pharmaceuticals has been incorporated to facilitate access to Indian pharmaceutical products, especially automatic registration and marketing authorisation in 90 days for products approved by developed country regulators, namely the United States (USFDA), the United Kingdom (UKMHRA), the European Union (EMA), and Japan (PMDA).

4.38 Further, India has included digital trade within the ambit of its FTA with UAE for the first time, which will help leverage India's advantage in digital payment and e-commerce services. The agreement also involves government procurement and data usage provisions, while completely safeguarding the provisions of General Financial Rules and the Orders issued thereunder, including Preference for 'Make in India' Order and MSME Preference policies.

India-Australia ECTA

4.39 Unlike UAE, Australia did not have as large an initial trade volume with India. Even so, Australia's trade basket with India has a substantial complementarity, thus classifying it as a natural trading partner.⁶³ India imports resources and primary products from Australia and exports finished goods.

4.40 Australia was India's 13th largest trading partner in FY24, and India was Australia's 5th largest trading partner in 2023. India-Australia bilateral merchandise trade increased from USD 25 billion in FY22 to USD 26 billion in FY23. The India-Australia Economic Cooperation

61 PIB Press release of Ministry of Commerce and Industry dated 27 March 2022, <https://pib.gov.in/PressReleasePage.aspx?PRID=1810279>.

62 India-UAE CEPA (FAQs), Question 3, <https://www.nsez.gov.in/Resources/Trade/FAQs%20on%20CEPA.pdf>

63 The trade complementarity index indicates to what extent the export profile of the reporter matches or complements the import profile of the partner. A high index may suggest that two countries would benefit from increased trade (WITS, World Bank). The TCI for Australia and the UK were 60 and 67 per cent in 2021 for India.

and Trade Agreement (ECTA) estimated bilateral trade in goods and services for both countries to rise from USD 27.5 billion in 2021 to USD 45 billion in 5 years.⁶⁴

4.41 The Agreement is likely to benefit various labour-intensive sectors of India, which were otherwise subjected to Australia's 5 per cent import duty on the majority of products earlier. It will result in immediate market access at zero duty to 98.3 per cent of tariff lines accounting for 96.4 per cent of India's exports to Australia in value terms. India is Australia's third largest services export market. Regarding market access to services, Australia has offered 135 sub-sectors to India, and India has offered 103 sub-sectors to Australia. The Agreement opens avenues for investment in computer-related services, telecom, construction, health & environmental services.⁶⁵

India-EFTA TEPA

4.42 The thrust of the India-EFTA Trade and Economic Partnership Agreement (TEPA) is deeper economic engagement with the EFTA countries- Switzerland, Norway, Iceland, and Liechtenstein. This is the first FTA of India with any European country. The successful conclusion of an FTA with this set of developed countries, is a significant positive signal to the world, showcasing India's firm commitment to trade liberalisation at a time of rising protectionism across both developed and developing countries. It is an innovative and well-balanced pact that covers two-way trade in goods and services as well as bilateral investments.

4.43 Further, India is also presently engaged in FTA negotiations with some of its trading partners; notable among these FTA negotiations are – (i) India-UK FTA, (ii) India-EU FTA, (iii) India-Australia Comprehensive Economic Cooperation Agreement (CECA), building on Ind-Aus ECTA, (iv) India-Peru Trade Agreement, covering goods, services, and investment, (v) India-Eurasian Economic Union (India-EAEU) FTA and (vi) India-Sri Lanka Economic and Technical Cooperation Agreement (ECTA). The Government reviews FTAs based on extensive inter-ministerial and industry consultations. Accordingly, reviews of its existing FTAs, namely, the India-South Korea CEPA and the ASEAN-India Trade in Goods Agreement (AITIGA), have been initiated.

Government initiatives on trade facilitation measures and reduction in logistics cost

4.44 The Government has undertaken various measures to enhance production capacity, promote exports and reduce logistics costs involved in international trade. These include setting export targets and monitoring these targets followed by course correction, provision of export credit insurance services for short-term as well as medium and long-term exports, and encouraging banks to provide affordable and adequate export credit to micro, small and medium enterprises (MSME) exporters, enabling them to explore new markets and diversify

⁶⁴ India Australia ECTA-FAQ, <https://commerce.gov.in/wp-content/uploads/2022/09/FAQs-for-IndAus-ECTA-2.pdf>

⁶⁵ PIB press release of Ministry of Commerce and Industry dated 8 January 2023, <https://tinyurl.com/286udedz>

existing products competitively, among others. The Government has also streamlined trade processes, enhancing transparency and promoting cooperation among stakeholders through initiatives such as Turant,⁶⁶ Customs,⁶⁷ Single Window Interface for Facilitation of Trade (SWIFT),⁶⁸ pre-arrival data processing, e-Sanchit,⁶⁹ Coordinated Border Management, etc.

4.45 The Central Board of Indirect Taxes and Customs (CBIC) has undertaken various technological initiatives to facilitate trade. These include the phased implementation of an electronic cash ledger,⁷⁰ enabling electronic clearances at Land Customs Stations, online submission of IFSC Code, use of Electronic Certificates of Origin, and Electronic Repairs Services Outsourcing to prolong the life of faulty or damaged electronic goods, among others. Department of Posts (DoP) has developed a Postal Bill of Export Automation System for the electronic filing and processing of PBE, under which an exporter is not required to visit a Foreign Post Office and present an export parcel. In a transformative partnership, the CBIC and the DoP launched the Hub and Spoke Model, simplifying the export process, promoting small-scale exporters, and leveraging India's extensive global trade postal network. This scheme harnesses the vast postal network of 1.54 lakh post offices, using digital technology and apps, and eliminates intermediaries for seamless exports via postal services.

4.46 To boost efficiency and lower logistics costs, the Government launched the PM GatiShakti National Master Plan and the National Logistics Policy (NLP) in October 2021 and September 2022, respectively. Digital reforms, such as the Unified Logistics Interface Platform (ULIP)⁷¹ and the Logistics Data Bank,⁷² are additional measures taken towards improving logistics. Initiatives, such as railway track electrification, reduced release times by the Land Ports Authority of India (LPAI), and the launch of NLP Marine for port-related logistics were also undertaken. Since the launch of the NLP, over 614 industry players have registered on ULIP, 106 private companies have signed Non-Disclosure Agreements (NDAs), 142 companies have submitted 382 use cases to be hosted on ULIP and 57 applications have been made live as of September 2023.⁷³

4.47 As a result of these initiatives, there has been an improvement in India's performance in the United Nations Economic and Social Commission for Asia Pacific's (UNESCAP) Global Survey on Digital and Sustainable Trade Facilitation.⁷⁴ In the survey, India scored 93.5 per

66 'Turant' is a Hindi word which means 'speedy'

67 Turant customs is the contactless customs initiative, which leverages technology to obviate the physical interface between customs authorities and importers/exporters/customs brokers/other stakeholders.

68 SWIFT provides importers and exporters the facility to lodge their clearance documents online at a single point only.

69 e-Sanchit allows the trader to upload all supporting documents digitally for obtaining clearances, eliminating the need for the trader to approach PGAs (Participating Government Agencies) to obtain various clearances

70 The Electronic Cash Ledger (ECL) has enabled the importer, exporter, or any person liable to pay duty, fees, etc., to deposit an advance with the Government instead of transaction-wise payment as being done at present, which could be used to pay his liabilities under this Act or under any other law for the time being in force.

71 ULIP is designed to enhance efficiency and reduce the cost of logistics in India by creating a transparent, one-window platform that can provide real-time information on cargo movements to all stakeholders.

72 Logistics Data Bank integrates the information available with various agencies across the supply chain to provide detailed real-time information related to containerised EXIM logistics within a single window.

73 PIB Press Release of Ministry of Commerce dated 14 September 2023, <https://pib.gov.in/PressReleaseDetail.aspx?PRID=1957407>.

74 The Survey covers the WTO Trade Facilitation Agreement (TFA) along with a set of nearly 60 trade facilitation measures categorised into eleven sub-groups. A three-step data collection and validation approach is generally followed and implemented over 6 months every two years. A lower score represents an improvement in trade facilitation measures. <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1938008>

cent in 2023 vis a vis 90.3 per cent in 2021. India scored 100 per cent in four key areas: Transparency, Formalities, Institutional Arrangement and Cooperation, and Paperless Trade. Further, the country has witnessed a substantial improvement in the score for “Women in Trade Facilitation” component from 66.7 per cent in 2021 to 77.8 per cent in 2023, indicating a commitment to gender inclusivity and women's empowerment in the trade sector.

4.48 Another evidence of the success of trade facilitation measures is reflected in the National Time Release Study (2023)⁷⁵ conducted by the CBIC. The study shows that the overall average import release time⁷⁶ has improved by 20 per cent in 2023 over 2022. The maximum improvement in the average release time was reported by Mundra (33 per cent) among seaports, Hyderabad (44 per cent) among Air Cargo Complexes (ACCs), and Tughlakabad (23 per cent) among Inland Container Depots.

4.49 The reduction in logistics cost is reflected in an improvement in India's rank on the World Bank's Logistics Performance Index (LPI),⁷⁷ which improved by six places to 38th in 2023 from 44th in 2018 out of 139 countries. With the introduction of cargo tracking, dwell time⁷⁸ in the eastern port of Visakhapatnam fell from 32.4 days in 2015 to 5.3 days in 2019. Additionally, India's position in international shipments climbed to 22 in 2023 from 44 in 2018 due to its modernisation and digitalisation efforts. India moved up five places in infrastructure score and four places up to 48th in logistics competence and equality. The Government aspires to secure a position within the top 25 countries on the index, which comprises 139 countries, by 2030.⁷⁹ Indian Ports' "Median Turn Around Time" has reached 0.9 days, which is better than the USA (1.5 days), Australia (1.7 days) and Singapore (1.0 days), as per the World Bank's Logistics Performance Index (LPI) Report 2023.⁸⁰

4.50 The Sagarmala scheme has promoted port-led development by harnessing India's 7,500 km long coastline, 14,500 km of potentially navigable waterways and strategic location on key international maritime trade routes. The Ministry for Ports, Shipping and Waterways estimates India's total port capacity to increase from 2,600 MTPA (million tonnes per annum) to more

75 Available at: <https://old.cbic.gov.in/resources/htdocs-cbec/implmntin-trade-facilitation/national-time-release-study15062023.pdf>. National Time Release Study (NTRS) 2023 covers the import and export release time for 15 major ports, representing the four-port categories. The study covers 4 Seaports, 6 ACCs, 3 Inland Container Depot and 2 Integrated Check Posts; these geographically well-distributed ports cumulatively account for approximately 80 per cent of the bills of entry and 70 per cent of the shipping bills filed in the country.

76 Cargo release time is the time taken from the arrival of the cargo at the customs station to its out-of-charge for domestic clearance in case of imports and arrival of the cargo at the customs station to the eventual departure of the carrier in case of exports.

77 The LPI is an interactive benchmarking tool created to help countries identify the challenges and opportunities they face in their performance on trade logistics and what they can do to improve their performance, https://lpi.worldbank.org/sites/default/files/2023-04/LPI_2023_report_with_layout.pdf

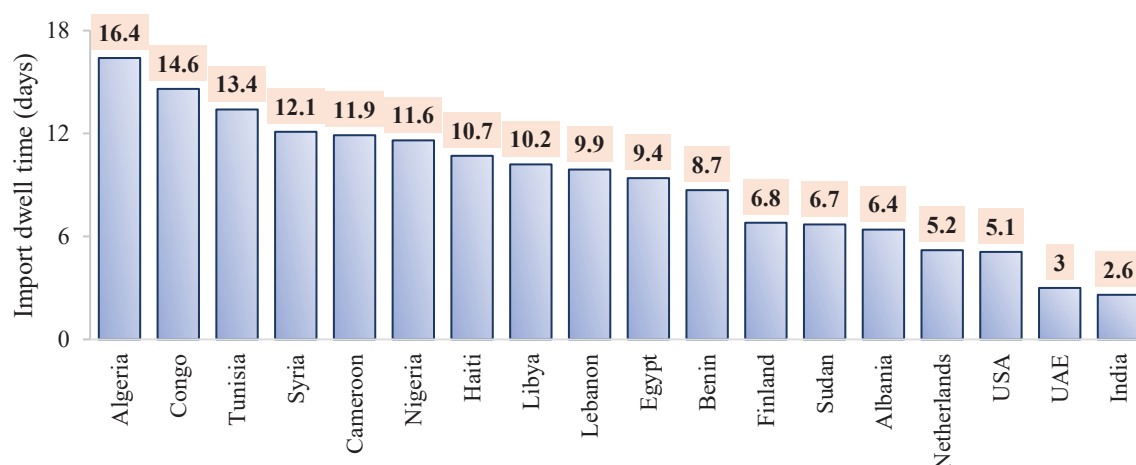
78 As per the World Bank LPI Glossary, dwell time refers to the time spent at the same location from container arrival to departure. Dwell time applies to port, exports, import, or inland terminal facilities. Consolidated import and export dwell time is defined as the sum of dwell times at port and intermediate inland locations after the ship's unloading (imports) or before the container's loading on the ship (exports).

79 PIB Press Release of Ministry of Commerce and Industry dated 17 September 2022, <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1860230>

80 Lead time data from supply chain tracking datasets, Appendix 2, page 37 of World Bank Logistics Performance Index report 2023, https://lpi.worldbank.org/sites/default/files/2023-04/LPI_2023_report_with_layout.pdf

than 10,000 MTPA in 2047.⁸¹ From April to November 2023, cargo of 86.5 MMT moved through waterways as compared to 80.4 MMT during April to November 2022, i.e. an increase of 7.5 per cent.⁸² The Government also aims to operationalise 23 waterways by 2030.

Chart IV.19: Decline in dwell time for India



Source: World Bank Logistics Performance Report: 2023

4.51 The Goods and Services Tax (GST) has played a remarkable role in reducing logistics costs. The ‘One Nation, One Tax’ regime has ensured that trucks do not have to wait for hours on state borders, which has reduced travel time by up to 30 per cent. This has reduced the logistics cost and increased the average distance trucks travel from 225 km before GST to 300-325 km, as per a Ministry of Road Transport and Highways report.⁸³ This has been a great value, adding to the ease of doing business and the growth of manufacturing in the country. An NCAER study of December 2023 has shown that the logistics cost in the economy has declined by 0.8 to 0.9 percentage points of GDP between FY14 and FY22.⁸⁴

4.52 The improvement in India’s logistics performance is also reflected at the State level. The 2023 Logistics Ease Across Different States (LEADS) highlights a positive shift in stakeholders’ perception across all three pillars of logistics performance services, infrastructure and regulatory environment in 2023 over 2019, empowering State Governments by providing region-specific insights for informed decision-making and comprehensive growth.⁸⁵ A positive shift in stakeholder perception is attributed to multiple reform measures initiated by States and UTs over the past couple of years to improve their logistics eco-system, including formulation of logistics policy, development of supporting infrastructure and enhancing regulatory ease.

81 PIB Press Release of Ministry of Ports, Shipping and Waterways dated 19 August 2023, <https://tinyurl.com/2n68d6em>

82 PIB Press Release of Ministry of Ports, Shipping and Waterways dated 2 January 2024, <https://tinyurl.com/572j5mnn>

83 Ministry of Road Transport and Highways booklet on GST, https://morth.nic.in/sites/default/files/Booklet_on_GST.pdf

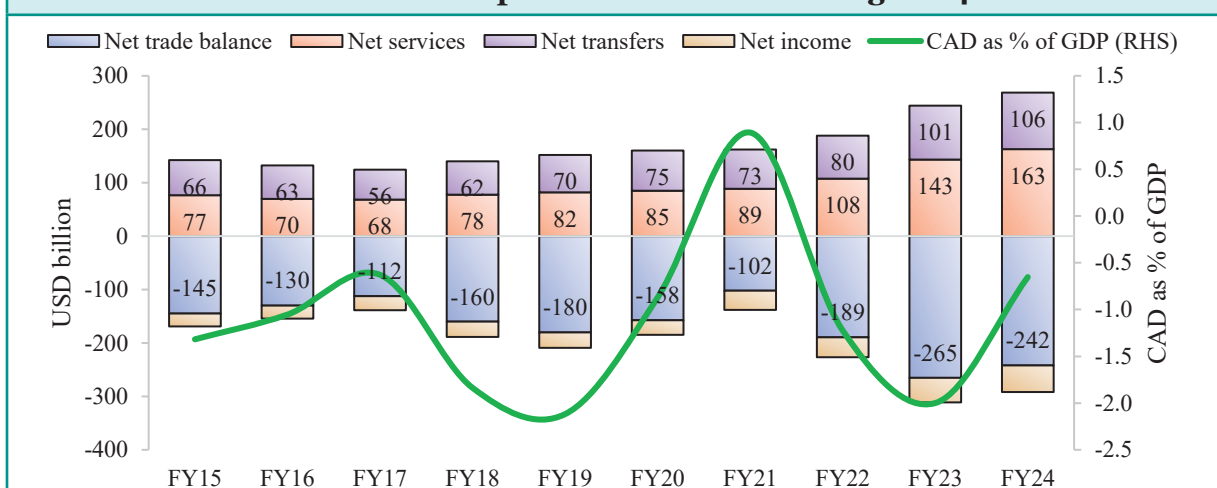
84 National Council of Applied Economic Research Report on ‘Logistics Cost in India-Assessment and Long-term Framework’, https://www.ncaer.org/wp-content/uploads/2023/12/NCAER_Report_LogisticsCost2023.pdf

85 LEADS is a stakeholders’ survey and uses the World Bank’s Logistics Performance Index (LPI) methodology. The State LPI is arrived at using a ranking methodology for stakeholder engagement based on a series of meetings and online surveys in the key areas of logistics- infrastructure, services timelines, traceability, competitiveness, security, operating environments, and efficiency of regulation. <https://drive.google.com/drive/folders/17bWqWyvprnVwxyQUgQYpwloKhopNuubj?usp=sharing>

FAVOURABLE CURRENT ACCOUNT BALANCE

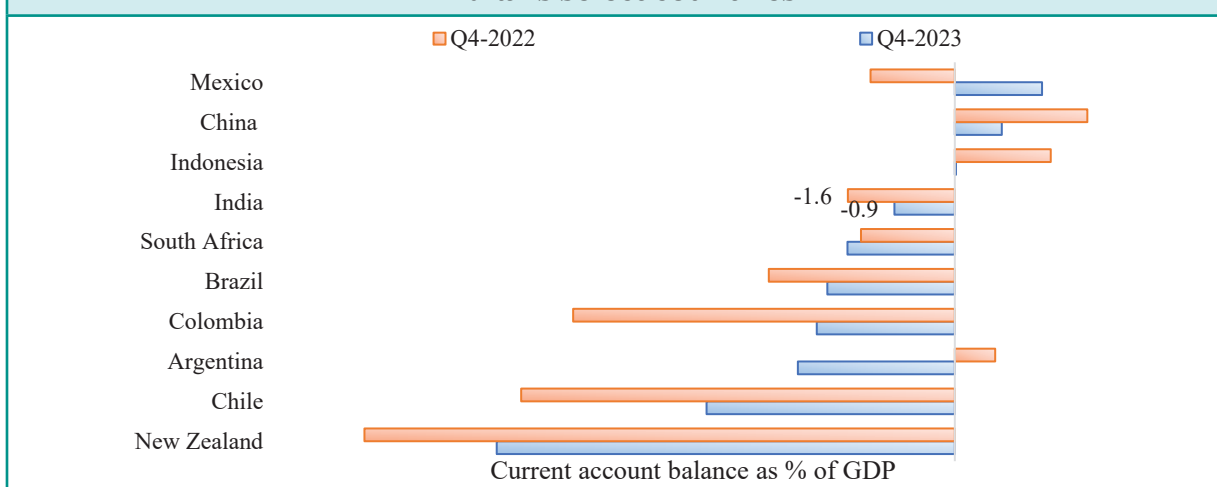
4.53 The current account is a record of a country's international transactions with the rest of the world. Trade is the dominant component of India's current account. As discussed in para 4.13, the narrowing of the overall trade deficit and increasing remittances (refer to para 4.54 below) contributed to an improvement in the CAD in FY24. India's CAD narrowed to USD 23.2 billion (0.7 per cent of GDP) in FY24 from USD 67 billion (2 per cent of GDP) during the previous year. The improvement in CAD in FY24 is supported by the surplus in CAD recorded in Q4 of FY24 on the grounds of a decline in merchandise trade deficit, rising net services exports and increasing remittances. An analysis of India's CAD in relation to other nations reveals that India's CAD is relatively low (Chart IV. 21)

Chart IV.20: Improvement in CAD during FY24



Source: Table No. 196, 'India's Overall Balance of Payments-Quarterly-USD Dollars', External Sector, Handbook of Statistics on the Indian Economy, RBI

Chart IV.21: Current account balance as a percentage of GDP: India vs select countries



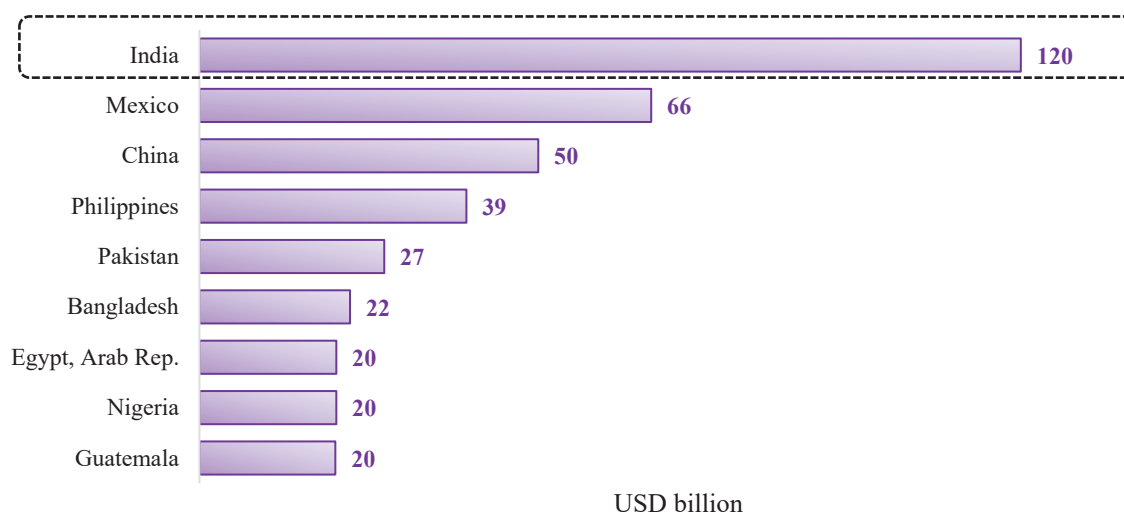
Source: OECD Economic Outlook database 115

Invisibles

4.54 Net services receipts increased from USD 143.3 billion during FY23 to USD 162.8 billion in FY24, primarily on account of rising exports of software, travel and business services. Similarly, the net private transfer receipts, mainly representing remittances by Indians employed overseas, was USD 106.6 billion in FY24, against their level of USD 101.8 billion during the previous year. Net services exports and remittances contributed to the surplus on the invisible account, which cushioned the merchandise trade deficit.

4.55 Remittances are the second largest source of external financing after service exports, which contributes to narrowing the CAD and has always been a stable constituent of the BoP. According to the World Bank, India has the largest emigrant population and is the top remittance recipient country, with remittances reaching a milestone of USD 120 billion in 2023.⁸⁶ The increase in remittances was driven mainly by declining inflation and strong labour markets in the United States and Europe, the largest destination for India's skilled migrants, and other OECD destinations, as well as positive demand for skilled and less-skilled workers in the GCC countries (which, together, are the second largest destination for Indian migrants).

Chart IV.22: India emerged as the top remittance recipient in the World in 2023



Source: World Bank

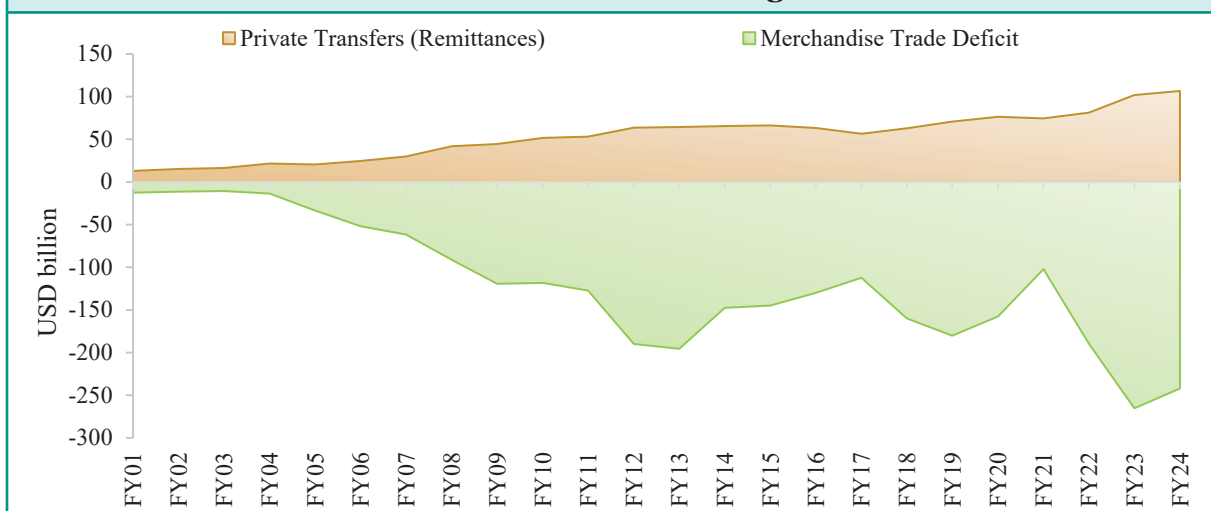
4.56 The remittance flows have also benefited from the agreement with the UAE to promote the use of Dirhams and Rupees for cross-border transactions. Remittances to India are forecasted to grow at 3.7 per cent to USD 124 billion in 2024 and at 4 per cent to reach USD 129 billion in 2025. India's share in South Asian remittances increased to 64.5 per cent in 2023 from 63 per cent in 2022.⁸⁷

⁸⁶ Migration and Development Brief 40, June 2024, https://www.knomad.org/sites/default/files/publication-doc/migration-and-development-brief_40.pdf

⁸⁷ Ibid

4.57 Remittances differ from FDI, which companies disinvest during financial uncertainties. In times of economic downturn, FDI is considered pro-cyclical and destabilising. Remittances are a stable source of finance that will remain in the economy and are directly used by recipients, contributing to the nation's growth. From a BoP perspective, remittances are permanent foreign currency inflows and help finance merchandise trade deficits, contributing to the narrowing of the CAD. For net importers such as India, higher remittances partially offset the goods trade deficit and stabilise the CAD.

Chart IV.23: Higher remittances offsetting the goods trade deficit and stabilising CAD



Source: Table No. 196, 'India's Overall Balance of Payments-Quarterly-USD Dollars', External Sector, Handbook of Statistics on the Indian Economy, RBI

Table No. 192, 'India's Foreign Trade-USD Dollars', External Sector, Handbook of Statistics on the Indian Economy, RBI

Note: Private transfers are assumed as remittances in BoP data released by RBI

Box IV.5: Factors influencing inward remittances

The robust recovery of job markets in the high-income countries of the Organisation for Economic Co-operation and Development (OECD) following the onset of the COVID-19 pandemic has been the key driver of remittances, particularly as employment growth during the recovery was more rapid for immigrants than for the native-born. However, the remittance growth was 7.5 per cent in 2023 compared to a historic peak of 24.4 per cent in 2022.

Some key factors influencing the extent of inward remittances to India are discussed below.

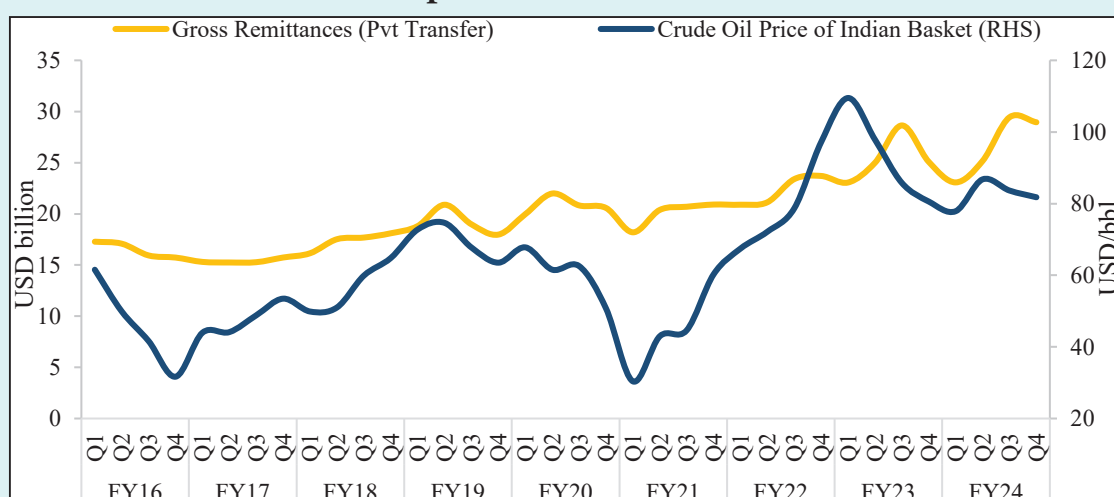
Remittances and oil prices: India meets a large part of its crude oil demand from imports, and a rise in global oil prices is a negative shock to the economy as it leads to a widening of CAD, an increase in inflation, and a weaker rupee. As reported in the Monetary Policy Report (October 2018), "it is estimated that for every USD 1 increase in the price of a barrel of crude, India's current account deficit could widen by USD 0.8 billion". However, the rise in global oil prices generally positively impacts the remittances received by the country, as

India's primary source of remittances is oil-exporting countries. An analysis of quarterly data on remittances and oil prices shows that there exists a positive correlation of 75.4 per cent between the two for India.

Chart IV.24 further corroborates this correlation, as periods of rise in oil prices are associated with higher remittances.

The plausible mechanism is as follows: an increase in oil prices (positive shocks) can generate a sizable amount of oil revenues, leading to higher investments and growth in oil-producing countries. As a result, the demand for migrant workers increases, translating into higher remittance outflows.⁸⁸ On the other hand, persistently low oil prices (adverse shocks) can hamper economic activities in oil-exporting economies by decreasing oil revenues. Correspondingly, the demand for migrant workers decreases, which in turn can reduce remittance outflows to migrant worker countries.

Chart IV.24: Association between gross remittances and crude oil price of Indian Basket



Source: Table No. 196, 'India's Overall Balance of Payments-Quarterly-USD Dollars', External Sector, Handbook of Statistics on the Indian Economy, RBI
Crude Oil FOB Price (Indian Basket), Petroleum Planning and Analysis Cell (PPAC)

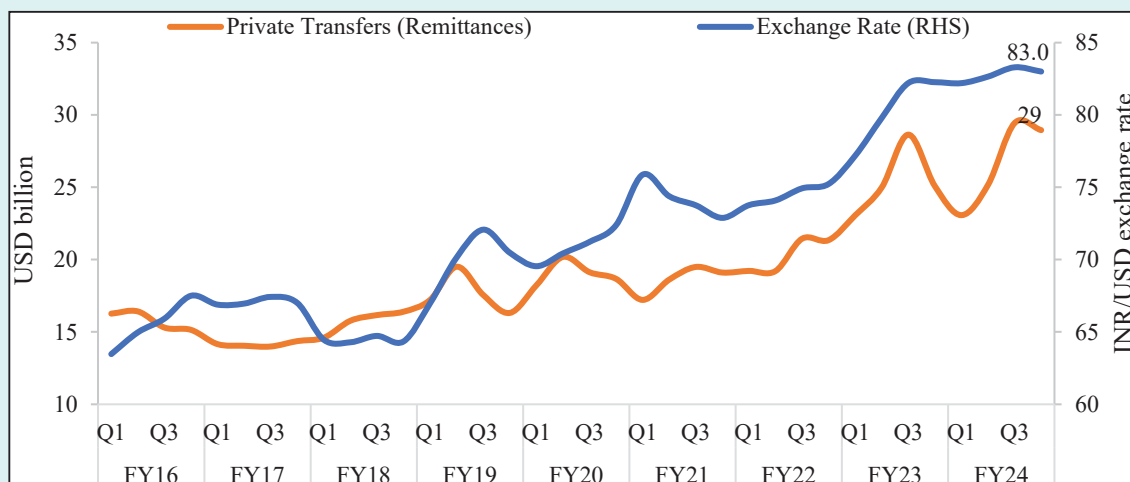
Remittances and exchange rate: A higher CAD results in an increase in the demand for foreign currency and an increase in the supply of domestic currency as firms and consumers buy more imports. This applies downward pressure to the exchange rate. On the other hand, remitters get better value in rupee terms when it depreciates in terms of foreign currencies, be it for UAE's Dirham, the US Dollar, the British Pound, or any other currency.

For every one USD a worker earns in distant lands, he returns an augmented amount after necessarily being converted according to the foreign land he works in. Hence, remittances exhibited a positive association with the exchange rate movement. An analysis of quarterly

88 Ibid footnote 86

data on remittances and exchange rate shows that there exists a positive correlation of 91 per cent for India. Chart IV.25 further corroborates this correlation, as periods of exchange rate depreciation are associated with higher remittances.

Chart IV.25: Positive association of INR/USD and remittances



Source: Table No. 196, 'India's Overall Balance of Payments-Quarterly-USD Dollars', External Sector, Handbook of Statistics on the Indian Economy, RBI

Table No. 200, 'Exchange Rate of the Indian rupee vis-à-vis the SDR, US Dollar, Pound Sterling, Euro and Japanese Yen, External Sector, Handbook of Statistics on the Indian Economy, RBI

Outlook: The outlook for remittance in India for 2024 is strong, with the expectation that remittance growth will moderate to 3.7 per cent, taking remittance levels to USD 124 billion in 2024. The diversification of India's migrant pool between a large share of highly skilled migrants employed mostly in high-income OECD markets, and the less-skilled migrants employed in the GCC markets is likely to lend stability to migrants' remittances in the event of external shocks. India's efforts to link its Unified Payments Interface (UPI) with source countries such as the United Arab Emirates and Singapore are expected to reduce costs and speed up remittances.⁸⁹

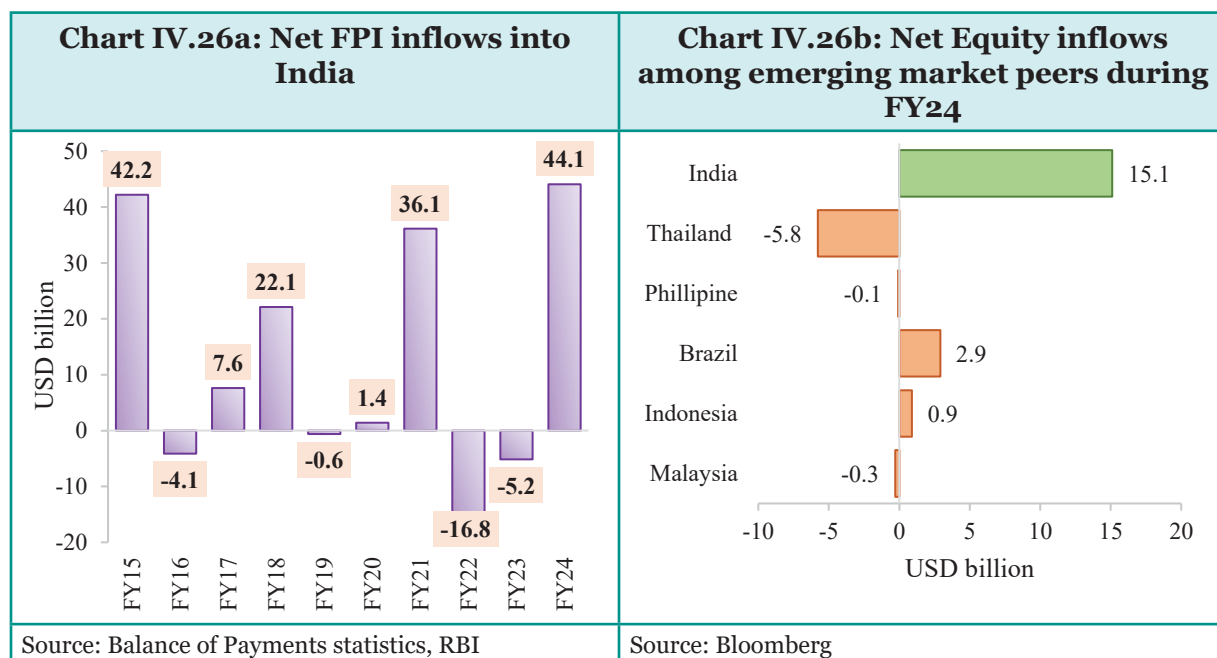
CAPITAL ACCOUNT BALANCE

4.58 Stable capital inflows continue to finance the CAD. During FY24, net capital flows stood at USD 86.3 billion against USD 58.9 billion during the previous year, primarily driven by FPI flows and net inflows of banking capital (including NRI deposits).

4.59 The net FPI flows saw a significant turnaround in FY24. Supported by optimism surrounding India's growth story, progressive policy reform, economic stability, fiscal prudence and attractive investment avenues, India witnessed robust FPI inflows in FY24. Net FPI inflows stood at USD 44.1 billion during FY24 against net outflows in the preceding two years. This is the highest level of FPI inflow after FY15. India received the highest equity inflows among

⁸⁹ Migration and Development Brief 40, World Bank

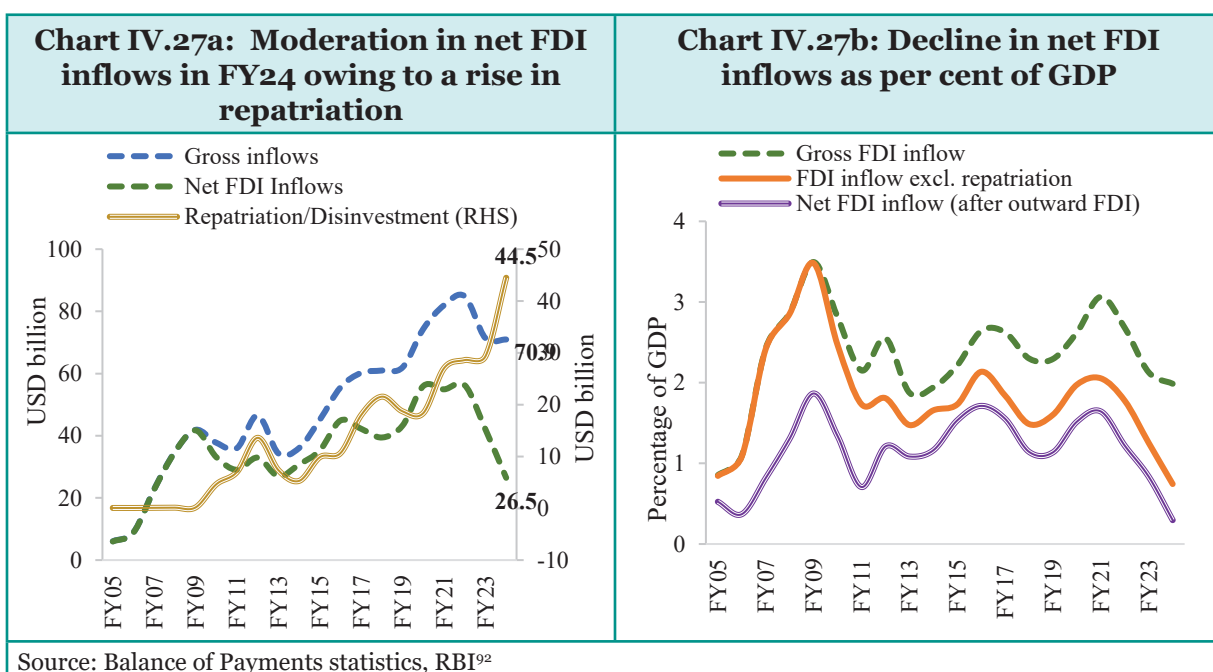
emerging market peers during FY24. Financial services, automobile and auto components, healthcare, and capital goods were the significant sectors attracting equity inflows during FY24. The recent inclusion of India's Sovereign Bonds in the JP Morgan Government Bond Index-Emerging Markets⁹⁰ is expected to contribute to higher debt inflows going forward and will likely spur demand for further exposure to India.



4.60 The UNCTAD World Investment Report 2024⁹¹ highlights that global FDI declined marginally by 2 per cent to USD 1.3 trillion in 2023 from USD 1.4 trillion in 2022. Weakening growth prospects, economic fracturing trends, trade and geopolitical tensions, industrial policies and supply chain diversification are reshaping FDI patterns, causing some multinational enterprises (MNEs) to adopt a cautious approach to overseas expansion. International project finance and cross-border mergers and acquisitions (M&As) were especially weak in 2023. M&As, which mostly affect FDI in developed countries, fell by 46 per cent in value. Project finance, important for infrastructure investment, was down 26 per cent. Tighter financing conditions, investor uncertainty, volatility in financial markets and tighter regulatory scrutiny were the principal causes of the decline. However, Greenfield investment project announcements provided a bright spot, with the number of projects increasing by 2 per cent, with the growth concentrated in manufacturing.

⁹⁰ On September 21, 2023, JPMorgan announced the inclusion of the Indian government bonds to its benchmark emerging-market index, i.e., JPMorgan Government Bond Index-Emerging Markets- starting June 28, 2024.

⁹¹ UNCTAD World Investment Report 2024-Investment Facilitation and Digital Government, https://unctad.org/system/files/official-document/wir2024_overview_en.pdf



4.61 The decline in global FDI flows has also impacted FDI flows to India. Net FDI inflows⁹³ to India declined from USD 42.0 billion during FY23 to USD 26.5 billion in FY24. However, gross FDI inflows moderated only by 0.6 per cent from USD 71.4 billion in FY23 to just under USD 71 billion in FY24. In other words, there was no change in investor interest in India. The contraction in net inflows was primarily due to a surge in repatriation/disinvestment due to many profitable exits. A market that allows investors to take profits and exit their investments is a healthy one. That is why the repatriation of investment increased from USD 29.3 billion in FY23 to USD 44.5 billion in FY24. The decline in FDI inflows in recent years is also attributable to higher interest rates in developed countries and attractive exits out of India due to the buoyant stock market.

An examination of change in trend and composition of FDI flows

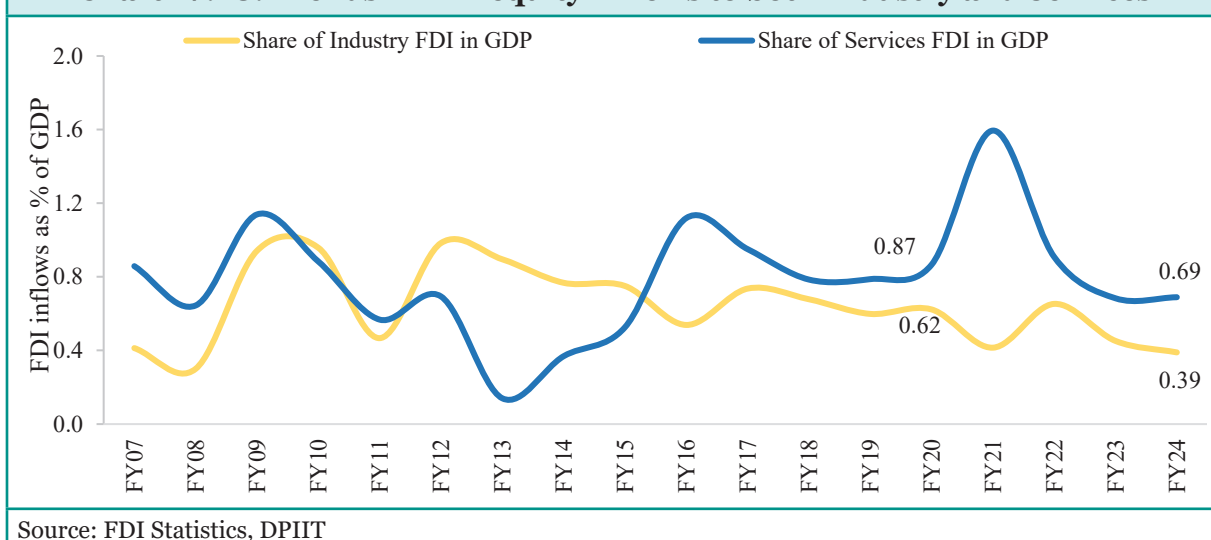
FDI in the industry vs services sector

4.62 A close examination of the FDI equity inflows into major sectors reveals that FDI inflow into the industry and services sectors⁹⁴ has weakened in recent years. In fact, for both these sectors, the FDI-to-GDP ratio has dipped below pre-pandemic levels. The share of industry sectors' FDI in GDP declined from 0.62 per cent in FY20 to 0.39 per cent in FY24. During the same period, the share of the services sector in GDP fell from 0.87 per cent to 0.69 per cent.

⁹² RBI data has been used here as DPIIT does not give data on Repatriation/Disinvestment

⁹³ Net FDI inflows=Gross FDI Inflows-Repatriation/Disinvestment

⁹⁴ Industry includes sectors such as drugs and pharmaceuticals, automobile industry, chemical, construction, electronics, etc. Services include sectors such as computer software and hardware, banking and insurance services, telecommunications, consultancy services, etc.

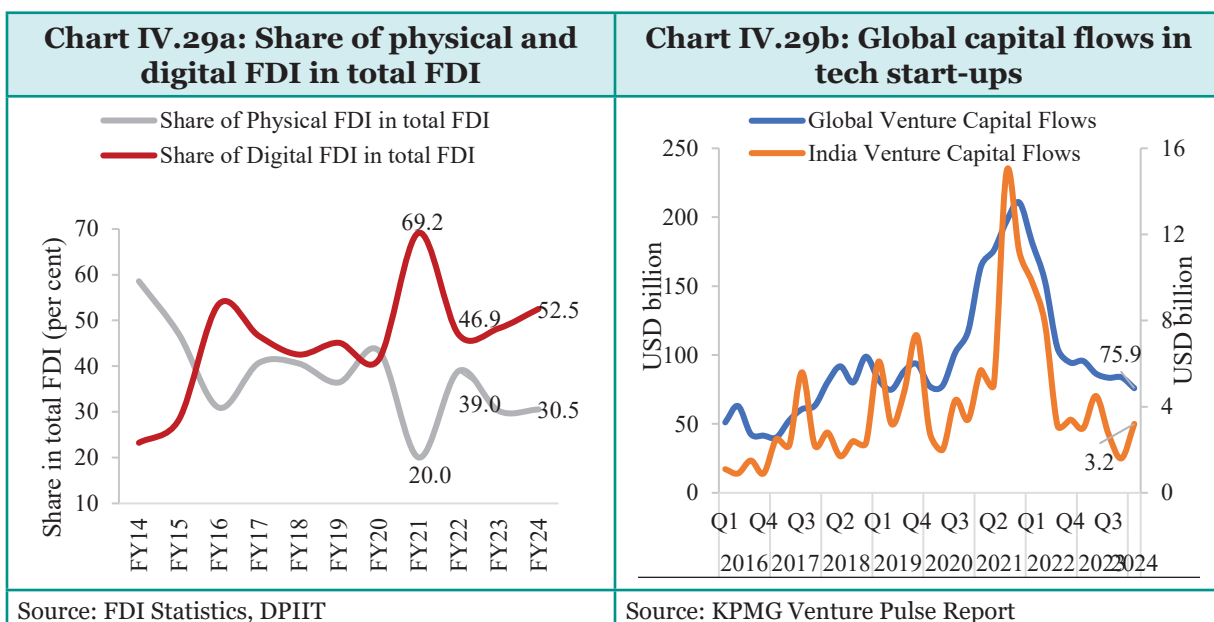
Chart IV.28: Trends in FDI equity inflows to both Industry and Services

Physical FDI vs Digital FDI

4.63 FDI inflows can be divided into physical and digital for further analysis. Physical FDI includes sectors such as automobiles, pharmaceuticals, and construction, while digital FDI includes computer services, telecommunications, consultancy services, and information and broadcasting.⁹⁵ A few years ago (FY14), physical FDI was about three times the value of digital FDI. Owing to a rise in foreign investment in sectors such as software and hardware, consultancy services, and telecommunications, among others, digital FDI witnessed an increase, coupled with a relative decline in physical FDI.

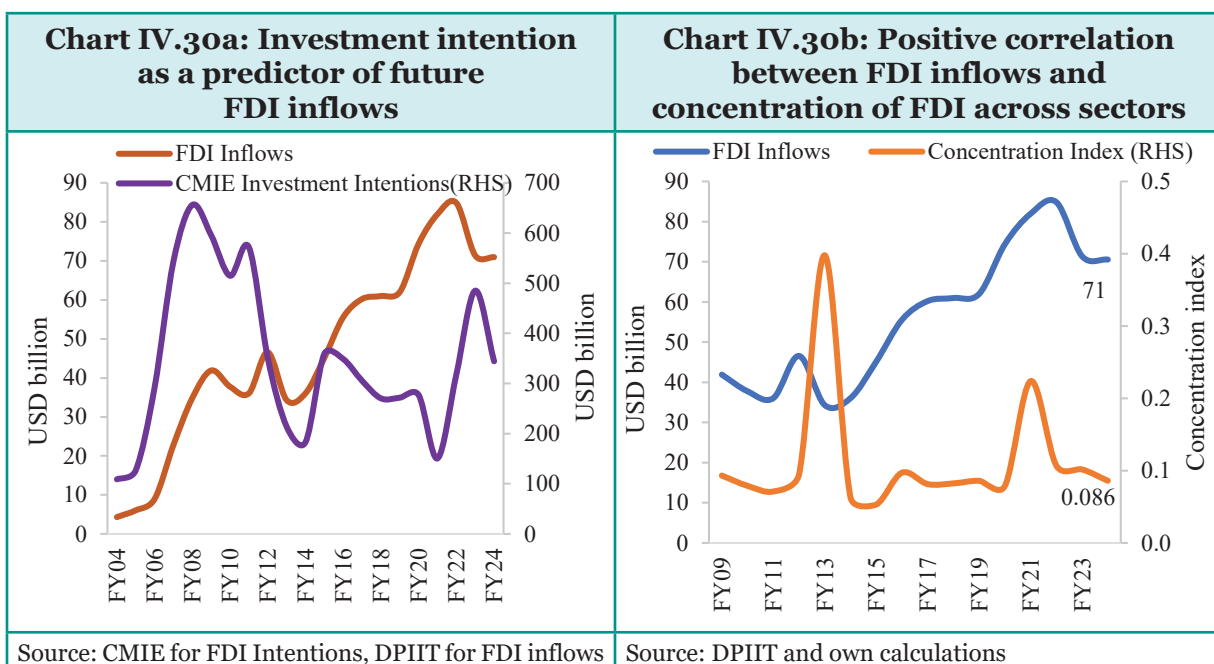
4.64 Nomura's Global Market Research May 2024, 'Asia's New Flying Geese', highlights that rising protectionism and geopolitical tensions have triggered the stagnation of physical FDI. One factor exacerbating this trend is the growing prevalence of non-equity modes of international production, such as contract manufacturing, third-party outsourcing or franchising. Under these scenarios, while economies may become more integrated into GVCs, this may not be reflected in the FDI data. During the pandemic, there was a surge in the share of digital services in total FDI owing to the prevalence of work-from-home culture and the availability of efficient digital infrastructure. As a result, the share of digital FDI in total FDI rose from 46.6 per cent in FY17 to 69.2 per cent in FY21. However, both digital and physical FDI have been falling in recent times. The fall in digital FDI has much to do with tech start-ups. Following a big increase during the pandemic, global flows into tech start-ups have fallen, a global trend in flows that is mirrored in India as well.

⁹⁵ Reference: HSBC Global Research: India's FDI Mystery, Shifting Frontiers, <https://www.hsbc.co.in/wealth/insights/market-outlook/india-economics/2024-01/>



Actual FDI vs intentions

4.65 The declining FDI flows to India are at odds with India gaining market share in global trade in goods and services exports. In this context, an exercise was undertaken to understand the relationship between FDI inflows and investment intentions. Two data sources have been used to estimate intentions. One is the UNCTAD data on announced greenfield FDI projects; the other is CMIE’s announced foreign private sector projects.⁹⁶



⁹⁶ The UNCTAD data only refers to greenfield investments, while the CMIE database includes different sectors. UNCTAD records data when there is a clear indication that jobs and new capex will be created, while CMIE includes projects even before essential licenses or land has been obtained/acquired or the funding has been tied up.

4.66 Over time, there has been a significant change in the trend in investment intentions across sectors. While investment intentions in industries such as computers and chemicals have softened, investment intentions in new and futuristic sectors are increasing.⁹⁷ In recent quarters, investment intentions in new and futuristic sectors, such as renewables, artificial intelligence, data centres, EVs and batteries, green hydrogen, and semiconductors, have rapidly risen. India was a leading destination for AI-related FDI in 2022, receiving 122 AI-related FDI projects in 2022, with multinational companies such as ABB, Accenture, Deloitte, IBM, and Microsoft announcing investments in the country.⁹⁸ According to research by NASSCOM, India is an attractive destination for AI investment due to its relatively low operating costs and the world's second-largest pool of highly skilled AI, machine learning, and big data workers.⁹⁹

4.67 A detailed examination of CMIE Investment Intentions and UNCTAD data on greenfield projects reveals that a strong correlation of more than 56 per cent exists between these data sources. Chart IV.30a shows that investment intentions have been a good predictor of future FDI inflows. FDI inflows followed the same direction as CMIE Investment Intentions till FY15; however, in FY16, the trend diverged.

4.68 An estimation of FDI concentration using the Hershman-Herfindahl Index (HHI)¹⁰⁰ highlights a positive correlation between total FDI inflows and the concentration index, which implies that in years in which the Indian economy witnessed a surge in FDI inflows, FDI was concentrated in a few sectors only and was not broad-based across sectors, and vice-versa.

4.69 India has a well-established infrastructure to attract FDI in select sectors, i.e., greenfield projects such as renewables, digital services such as telecommunications, software and hardware, and consultancy services. However, this may be different across the board. Therefore, where investment intentions are high, the sectors must be made more accessible for investments. Notably, the focus must remain on improving the ease of doing business across sectors and extend beyond sectors attractive to FDI alone. While several low-hanging fruits with respect to the 'Ease of Doing Business' have been plucked already over the years, further work may lie in details across all levels of government – national, state and local - and across regulators.

4.70 An article in Bloomberg in April 2024¹⁰¹ noted that India was not competing with other developing nations only to attract FDI. It is competing with advanced nations who now actively and aggressively pursue industrial policies that privilege domestic investment by dangling subsidies to businesses to prevent them from investing abroad and to entice other overseas investors who might otherwise consider emerging nations like India. Educated labour and a skilled workforce coupled with a vibrant R&D culture are important magnets, apart from

97 As per the CMIE investment intentions data sector-wise

98 Global trends for FDI in AI, <https://www.investmentmonitor.ai/features/what-are-the-global-trends-for-fdi-in-ai/?cf-view>

99 NASSCOM Strategic Report-resilience to Resurgence: Technology Sector in India 2022, <https://nasscom.in/knowledge-center/publications/technology-sector-india-2022-strategic-review>

100 Hershman Herfindahl Index has been calculated by taking the sum of squares of the share of each sector in total FDI inflows

101 'Biden Trumps Modi In Fight for Foreign Investment', Bloomberg, 4 April 2024 (<https://www.bloomberg.com/news/newsletters/2024-04-04/modi-vs-biden-why-foreign-investment-into-india-is-still-declining>)

political stability, policy predictability and stability, reasonable duties and taxes, dispute resolution mechanisms and ease of repatriation. India has made considerable progress in many of these areas over the years. There may be unfinished work in other areas. But, above all, the route to sustained investor interest and consequent accumulation of knowledge and know-how in India may lie through better educational and skill outcomes.

4.71 The box below discusses how increased FDI inflows from China can help in increasing India's global supply chain participation along with a push to exports.

Box IV.6: China Plus One strategy

Over the last five years, a seismic change has occurred in the global manufacturing realm, with major multinational companies, including Apple and others, looking to 'de-risk' themselves from China, which was traditionally known as the 'world's factory'. This shift is primarily due to disruptions caused by COVID-19, growing tensions between the US and China, and rising costs of doing business in China. As a result, several companies have adopted a 'China plus one strategy' to reduce their reliance on China for high-tech electronic products and components. This approach involves supply chain decisions to decrease their risk exposure to China. For example, over 90 per cent of manufacturers in North America surveyed by the Boston Consulting Group in 2023 moved some or all of their production to other countries like Mexico, Thailand, and Vietnam, suggesting a move away from China.¹⁰²

Can India benefit from this 'China plus one' strategy? The appeal of India lies in its large domestic consumer market, which makes it attractive for companies to set up operations there. In the electronics sector, there is a focus on smartphone manufacturing and assembly. The Government's PLI scheme, including tax breaks and subsidies, plays a significant role in attracting companies. The rise in India's domestic smartphone demand is also a key factor in companies' decisions to invest there. For instance, Apple assembled USD 14 billion worth of iPhones in India during FY24, constituting 14 per cent of its global iPhone production.¹⁰³ Foxconn has started production of Apple mobile phones in Karnataka and Tamil Nadu.¹⁰⁴

While India may not be an immediate beneficiary of the trade diversion from China, it has witnessed a substantial increase in its electronic exports over time. The implementation of the PLI scheme has been a key driver of this growth. For instance, India's electronic exports to the US have transitioned from a trade deficit of USD 0.6 billion in FY17 to a trade surplus of USD 8.7 billion in FY24, underscoring a significant increase in value addition. Within the electronics sector, the category that has experienced the most growth is mobile phones, with exports to the US rising from USD 2.2 billion in FY23 to USD 5.7 billion in FY24.

As India looks to deepen its involvement in Global Value Chains (GVCs), it will look to the successes and strategies of East Asian economies. These economies have typically pursued

¹⁰² Boston Consultancy Group article, 'Harnessing the Tectonic Shifts in Global Manufacturing', <https://tinyurl.com/bnrerddz>.

¹⁰³ India Briefing, 'Apple's Contract Manufacturers and Component Suppliers in India', dated 17 April 2024, <https://tinyurl.com/357mv7hy>

¹⁰⁴ Ibid

two main strategies: reducing trade costs and facilitating foreign investment. Given that GVCs are designed to minimise costs, countries like Malaysia, Vietnam, and Taiwan have focused on lowering their trade costs over time. For India, improving logistical efficiency has been a key focus, as evidenced by a noticeable rise in India's score on the World Bank's LPI (as discussed in para 4.49). The second strategy, focused on investment facilitation, includes actions to increase and stabilise foreign investment. The PLI scheme, for example, encourages high-quality foreign investment by offering a market-linked incentive system for companies to comply with.

Over the medium term, India is focusing on integrating its value chain with that of the West, particularly in sectors like renewable energy and advanced technology, including artificial intelligence, semiconductors, and next-generation telecommunications. This strategy is being pursued through agreements such as the Australia-India Free Trade Agreement and the US-India Clean Energy Initiative. As a result, the trading patterns within these sectors are starting to develop. For example, the tariff classifications for environmentally friendly technology, such as solar water heaters, waste recycling devices, and wind turbines, show an increase in exports to the USA from USD 199.2 million in FY20 to USD 326.9 million in FY24¹⁰⁵. Further, leading American and European companies in the renewable energy sector, such as First Solar, Vesta, and Scatec, have established their operations in India to take advantage of the growing demand for green technologies.

Will China plus one result in a total movement of trading relations away from China? This may not be the case. Take, for example, nations like Mexico, Vietnam, Taiwan and Korea, which were direct beneficiaries of the US's trade diversion from China. Even while these nations increased their share of exports to the US, they also displayed a concomitant rise in Chinese FDI.¹⁰⁶ Therefore, the world cannot completely look past China, even as it pursues China plus one.

India faces two choices to benefit from China plus one strategy: it can integrate into China's supply chain or promote FDI from China. Among these choices, focusing on FDI from China seems more promising for boosting India's exports to the US, similar to how East Asian economies did in the past. Moreover, choosing FDI as a strategy to benefit from the China plus one approach appears more advantageous than relying on trade. This is because China is India's top import partner, and the trade deficit with China has been growing. As the US and Europe shift their immediate sourcing away from China, it is more effective to have Chinese companies invest in India and then export the products to these markets rather than importing from China, adding minimal value, and then re-exporting them. Further,

¹⁰⁵ HS Code-8402, 8406 and 8414.

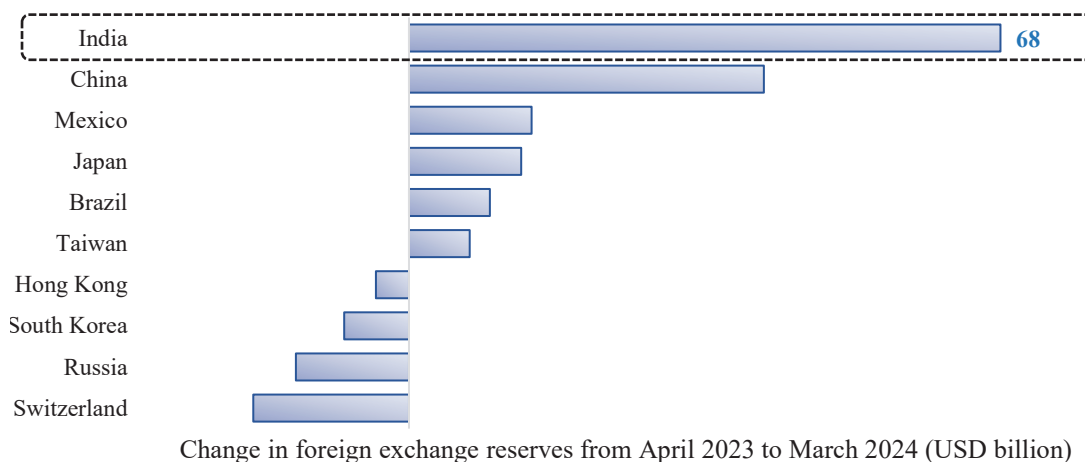
¹⁰⁶ Sourced from the presentation made by Pierre-Olivier Gourinchas, Economic Counsellor and Director of Research Department, IMF at NCEAR, India Policy Forum on 2 July 2024, 'CRACKS IN THE SYSTEM: How Geo-Economic Fragmentation is Reshaping the World'

a recent research note from the Rhodium Group points out, “China’s dominance over so many product categories creates, first and foremost, a risk of economic coercion, where the government restrains access to crucial inputs for political leverage.”¹⁰⁷ The same brief also notes, “Brazil and Turkey have raised barriers to imports of Chinese EVs, but enacted measures to attract Chinese FDI in the sector.” European nations, too, have decided to follow a similar approach¹⁰⁸. Hence, it is imperative that India finds the right balance between importing goods from China and importing capital (FDI) from China.

Comfortable Foreign Exchange Reserves

4.72 A moderation in the CAD amidst large capital inflows enabled the addition of foreign exchange reserves (FER) in FY24. The buffer of FER insulates domestic economic activity from global spillovers. These reserves act as a cushion and provide liquidity, ensuring India can meet its external obligations. During FY24, India’s FER increased by USD 68 billion, the highest increase among major foreign exchange reserves-holding countries. FER stood at USD 653.7 billion on 21 June 2024, enough to cover more than 10 months of imports projected for FY25 and more than 98 per cent of total external debt outstanding at the end of March 2024.

Chart IV.31: India witnessed the most significant increase in foreign exchange reserves holdings in FY24

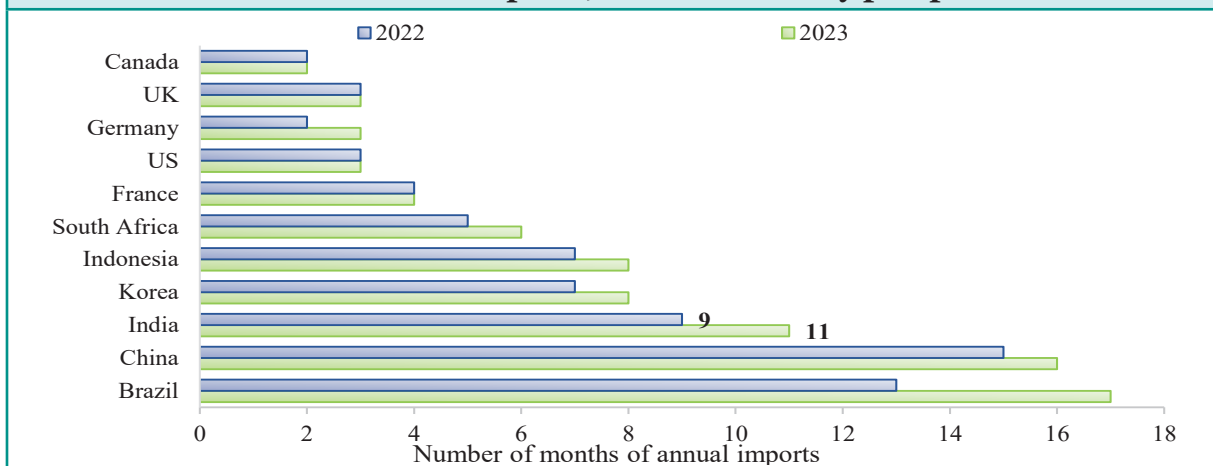


Source: Bloomberg, RBI for India (Handbook of Statistics on Indian Economy, Foreign Exchange Reserves, Weekly, RBI)

107 How China's Overcapacity Holds Back Emerging Economies', Rhodium Group, 13 June 2024 <https://tinyurl.com/y9d6rpna>.

108 'Europe's Response to China Shock 2.0: Hold China Closer', Wall Street Journal, 23 June 2024 <https://tinyurl.com/j8trksxv>

Chart IV.32: Adequacy of India’s forex reserves (in terms of number of months of annual imports): A cross-country perspective

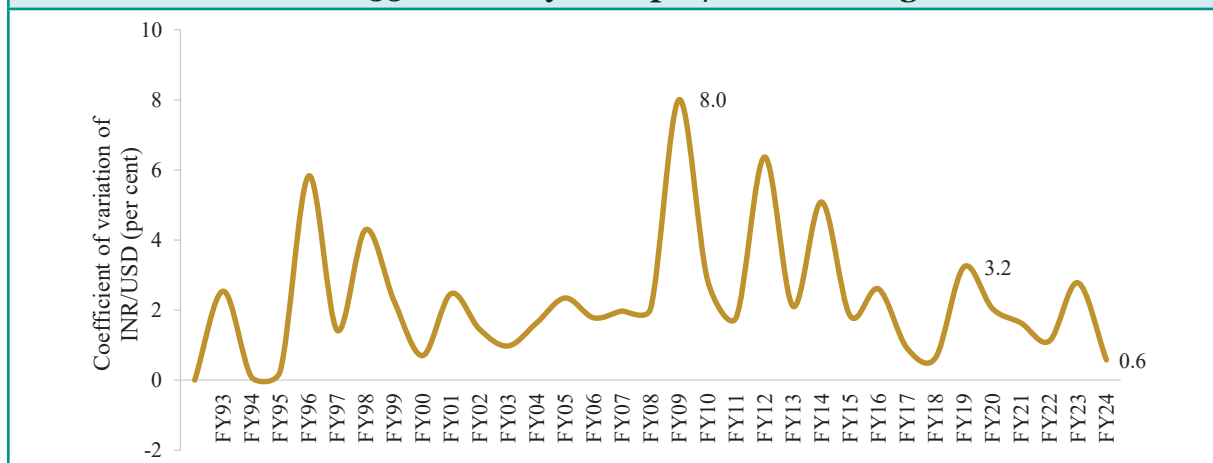


Source: IMF (forex reserves) and WTO (for import data)

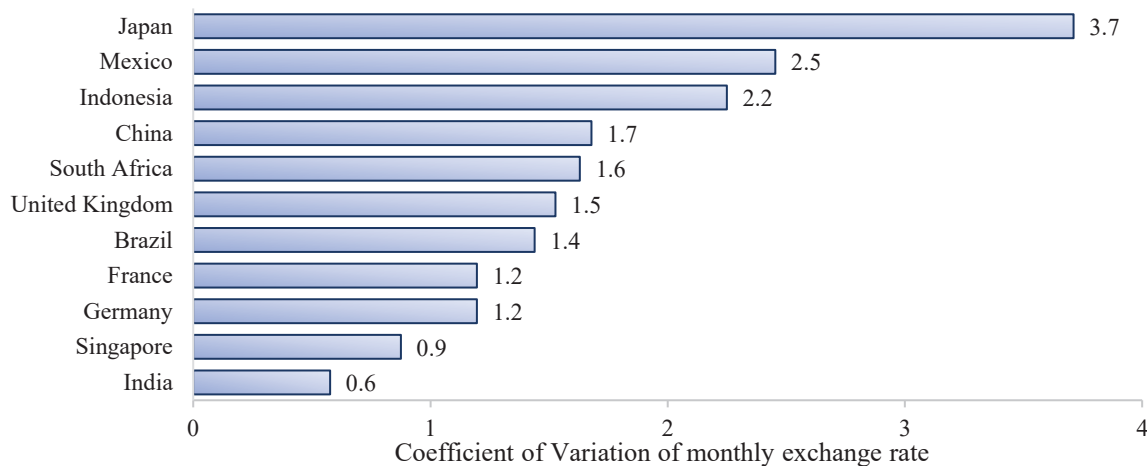
Exchange Rates

4.73 Despite FY24 being marked by geopolitical risks, rising interest rates and volatile commodity prices, the US economy exhibited resilience with positive economic indicators such as a tight labour market and upbeat consumer sentiments. These factors contributed to drawing global funds to US treasury markets as there was a higher demand for greenback on safe-haven appeal. In FY24, the US Dollar gained against virtually every major peer. The Rupee also came under depreciation pressure. However, INR was one of the least volatile major currencies. Further, it exhibited the lowest volatility in FY24 compared to the previous years. An estimation of volatility using the coefficient of variation (CV) highlights that CV was 0.58 during FY24, much lower than in the past years. The relative stability of the rupee, despite a stronger US dollar and elevated US treasury yields, reflects the strength of the Indian economy's sound macroeconomic fundamentals, financial stability, and improvements in external position. In the future, robust foreign inflows and comfortable trade deficits are expected to keep the rupee within a comfortable range.

Chart IV.33: Volatility of Rupee/USD exchange rate



Source: Own calculations based on Table No. 200, ‘Exchange Rate of the Indian rupee vis-à-vis the SDR, US Dollar, Pound Sterling, Euro and Japanese Yen, External Sector, Handbook of Statistics on the Indian Economy, RBI

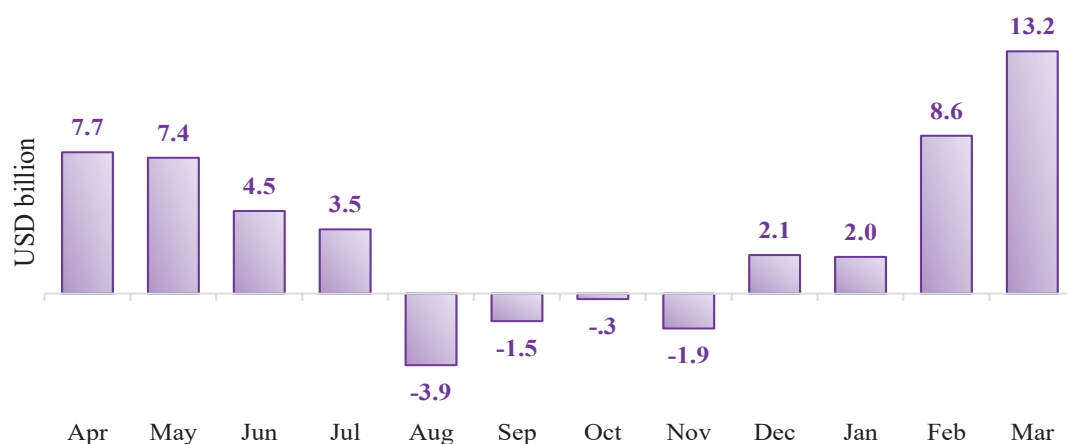
Chart IV.34: Exchange rate volatility of other countries w.r.t USD in FY24

Source: Data on Bilateral Exchange Rate from BIS data portal and own calculations

Note: Exchange Rate volatility has been calculated using the Coefficient of Variation

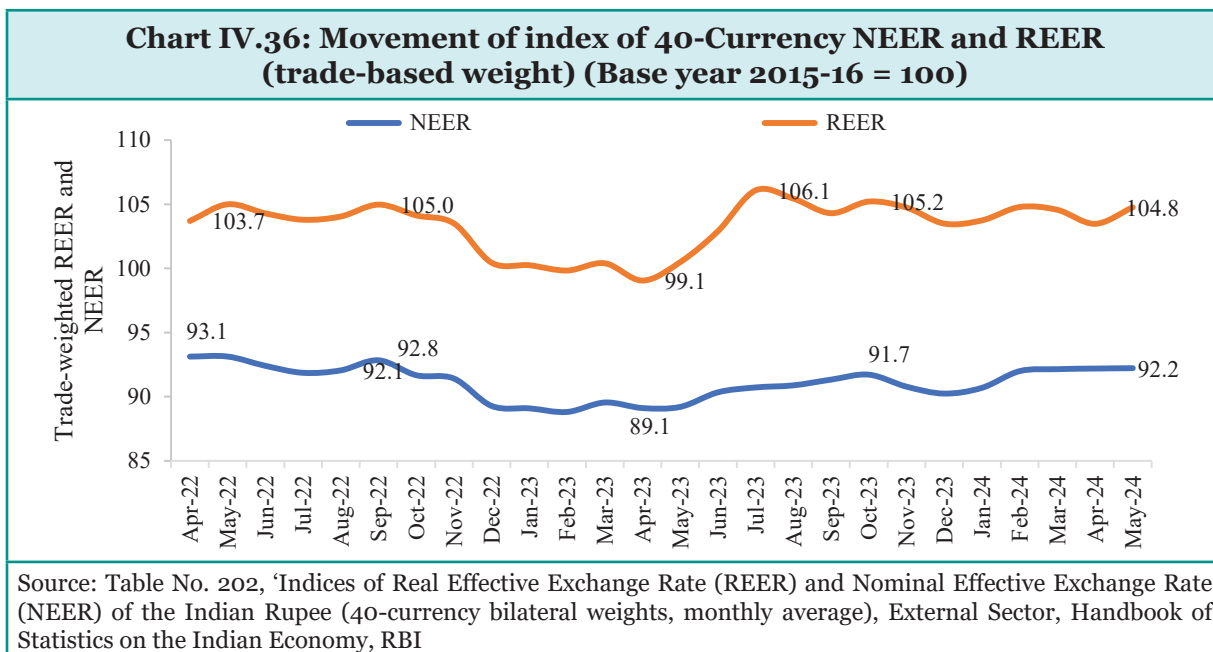
4.74 The Rupee/USD exchange rate was in the range of ₹82-83.5/USD in FY24, depreciating against USD by only 2.9 per cent during FY24. The Rupee depreciated by 6.9 and 6.8 per cent against Pound Sterling and Euro, respectively, in FY24. However, it appreciated by 3.5 per cent against Japanese Yen during the period.

4.75 The exchange rate of the INR is market-determined. The RBI regulates the foreign exchange market to ensure its orderly functioning and development and intervenes only to curb undue volatility in the INR. It has managed to contain INR volatility and keep foreign exchange markets stable. Recently, it announced various measures to diversify and expand the sources of forex funding to mitigate exchange rate volatility and dampen global spillovers. For example, the regulatory regime relating to FPI investment in debt flows has been revised to encourage foreign investment in Indian debt instruments.

Chart IV.35: Trends in net purchase (+) and sale (-) of foreign currencies by RBI during FY24

Source: Table No. 206, 'Sale and Purchase of US Dollar by Reserve Bank of India', External Sector, Handbook of Statistics on the Indian Economy, RBI

4.76 The indices of Nominal Effective Exchange Rate (NEER) and Real Effective Exchange Rate (REER) are used as indicators of external competitiveness.¹⁰⁹ In terms of 40-currency (trade-weighted), NEER depreciated by 0.6 per cent in FY24. However, REER appreciated by 0.8 per cent in FY24. In May 2024, NEER at 92.2 and REER at 104.7 recorded appreciation of 0.03 per cent and 1.2 per cent, respectively.



4.77 The box below discusses the impact of exchange rate changes on the Indian economy through the trade channel as well as the financial channel.

Box IV.7: Trade and Financial channels of the Exchange rate

Historically, a depreciated currency has been a key driver of export growth. The Marshall Lerner conditions, if met, suggest that currency depreciation can stimulate an increase in net exports by reducing export costs and increasing import prices. This 'trade' channel of the exchange rate has been well-documented for India. However, the exchange rate also influences the external sector through a 'financial' channel. Theory suggests that the financial channel of the exchange rate can potentially counterbalance the gains (or losses) made through the trade channel.

A weak Rupee can affect the Balance of Payments (BoP) by changing the supply and cost of foreign funding. For instance, depreciation can reduce the creditworthiness of local borrowers if they have Rupee-denominated assets and borrow in foreign currencies. This could raise the cost of foreign lending and lead to a net capital outflow. Globally, appreciation in domestic currencies (against the dollar) has increased cross-border banking capital flows.¹¹⁰ However, Kearns and Patel (2016) show that the financial channel of the exchange rate is generally more potent in EMEs, where unhedged foreign currency exposures are more likely to be present.¹¹¹

¹⁰⁹ NEER is the weighted average of bilateral nominal exchange rates of the home currency in terms of foreign currencies. The REER is defined as a weighted average of nominal exchange rates adjusted for relative price differential between domestic and foreign countries.

¹¹⁰ Bruno, V., & Shin, H. S. (2015). Capital flows and the risk-taking channel of monetary policy. *Journal of monetary economics*, 71, 119-132.

¹¹¹ Banerjee, R., Hofmann, B., & Mehrotra, A. N. (2020). Corporate investment and the exchange rate: The financial channel.

Over the last two decades, India's FDI and equity portfolio inflows have totalled about 2.5 per cent of GDP annually (IMF, 2023).¹¹² In general, inflows to the capital account increased by 65 per cent between FY-14 and FY-24. Therefore, in the context of India's large and growing financial account with the rest of the world, whether the Rupee should remain competitive is a question to ponder.

To answer this question, the two different channels of the exchange rate were estimated using a trade-weighted exchange rate and a debt-weighted exchange rate. The trade-weighted Nominal effective exchange rate (NEER) provided by the RBI is used to capture the trade channel. The financial channel is captured by a debt-weighted exchange rate (DWER), which is constructed as an arithmetic average of the Rupee against major foreign currencies, weighted by their share in the composition of external debt.

In theory, the net BoP must equate to zero as trade surpluses (deficits) equate to capital account deficits (surpluses). However, in practice, countries report net Bop deficits/surpluses with rare instances of BoP equilibrium. Literature explains BoP disequilibria as a monetary disequilibrium and as the result of excess supply or demand for currency.¹¹³ Therefore, to study the extent to which the two channels (trade and financial) counteract the other in the presence of currency movement, the dependent variable used here is net BoP.

An auto-regressive distributed lag (ARDL) model is deployed to capture the separate channels of a Rupee depreciation/appreciation on net Balance of Payments (BoP). The problem of endogeneity is controlled for in an ARDL framework in the absence of autocorrelation of errors. Further, multicollinearity is also not a significant issue as lags and differences of the variables are used.

$$\Delta \ln BoP_t = \gamma_i \Delta BoP_{t-1} + \delta_i \sum \Delta DWER_t + \beta_i \sum \Delta NEER + \theta X_t + \varepsilon_t$$

The data used is at a quarterly frequency between Q1 of FY12 to Q3 of FY24. The dependent variable is the net balance of payment in nominal terms calculated as Ln (BoP Credit)/(BoP Debit); DWER represents the debt-weighted exchange rate. The coefficients δ_i and β_i indicate the elasticity of net BoP to changes in the debt channel of the exchange rate and the trade channel of the exchange rate. X_t includes control variables such as World imports, repo rate, commodity prices, domestic demand, GDP deflator and a dummy for the COVID-19 years (March 2020 to March 2022). Optimal lags for the regressors are chosen according to the AIC criterion.

Dependent variable – Net BoP

Regressor	Long run Elasticity
DWER	0.16*
NEER	-0.7*

'*' denotes significance at the 10 per cent level

The results indicate that India's trade channel is stronger than the financial channel. Over the long run, the net effect of an appreciation is negative (-0.7 + 0.16). Thus, a per cent appreciation of the Rupee results in a net decline in the BoP by 0.54 per cent.

¹¹² IMF, 2024 India's Financial System: Building the Foundation for Strong and Sustainable Growth

¹¹³ See for instance, Frenkel, J., & Mussa, M. (1985). Asset Markets, Exchange Rates and the Balance of Payments, Handbook of International Economics, Volume II (eds.), Ronald Jones and Peter Kenen; Johnson, H, G. (1958). Towards a General Theory of the Balance of Payments.

In addition to conducting post-estimation checks for serial correlation and parameter stability (CUSUM test), robustness checks were performed by studying the variables in a dynamic OLS framework. The result of the robustness check is provided below:

Dependent variable – Net BoP

Regressor	Long run Elasticity
DWER	0.12**
NEER	-1.01**

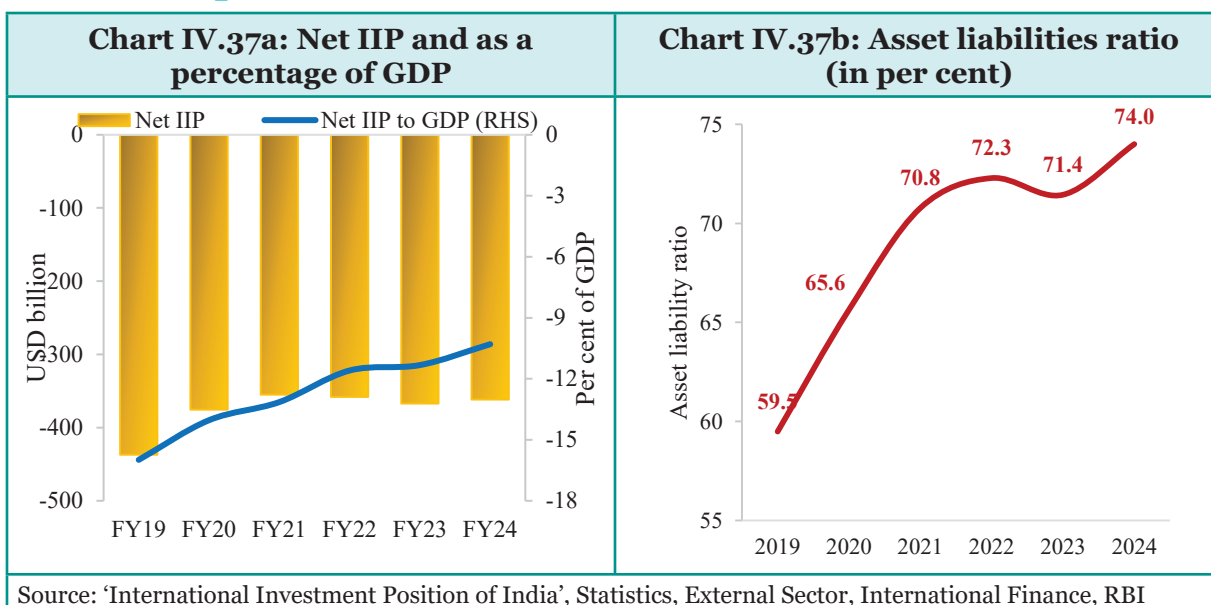
‘**’ denotes significance at the 5 per cent level

The results outline that a competitive Rupee continues to boost the BoP as the benefits received through the trade channel outweigh the costs incurred in the financial channel. As noted by Longaric 2022, India’s high trade openness and low share of external debt mean that the trade channel effect of currency fluctuations dominates the financial channel effect. This contrasts with other EMEs, such as Brazil and the Philippines, whose financial channel effect dominates the trade effect.

INTERNATIONAL INVESTMENT POSITION (IIP)

4.78 The Net IIP¹¹⁴ position determines whether a country is a net creditor or debtor nation by measuring the difference between its external assets and liabilities. As of the end of March 2024, Indian residents’ overseas financial assets at USD 1,028.3 billion were higher by USD 109.7 billion or 11.9 per cent compared to the level as of March 2023, mainly due to a rise in reserve assets, currency and deposits, overseas direct investment, trade credit and advances and loans. Reserve assets at USD 646.4 billion, accounting for around 62.9 per cent of India’s international financial assets, increased by 11.8 per cent over the same period.

Improvement in India’s net IIP in end-March 2024



¹¹⁴ According to the IMF, Balance of Payments and International Investment Position Manual, IIP is a statistical statement that shows at a point in time the value and composition of (a) financial assets of residents of an economy that are claims on non-residents and gold bullion held as reserve assets, and (b) liabilities of residents of an economy to non-residents. The difference between an economy’s external financial assets and liabilities is the economy’s net IIP, which may be positive or negative.

4.79 International liabilities at USD 1,390 billion as of the end of March 2024 were higher by USD 104.3 billion (8.1 per cent) as compared to the level in March 2023. The rise was attributed mainly to an increase in portfolio investment, loan, direct investment and other accounts payable. The share of debt liabilities in total external liabilities was 51.1 per cent as of March 2024.

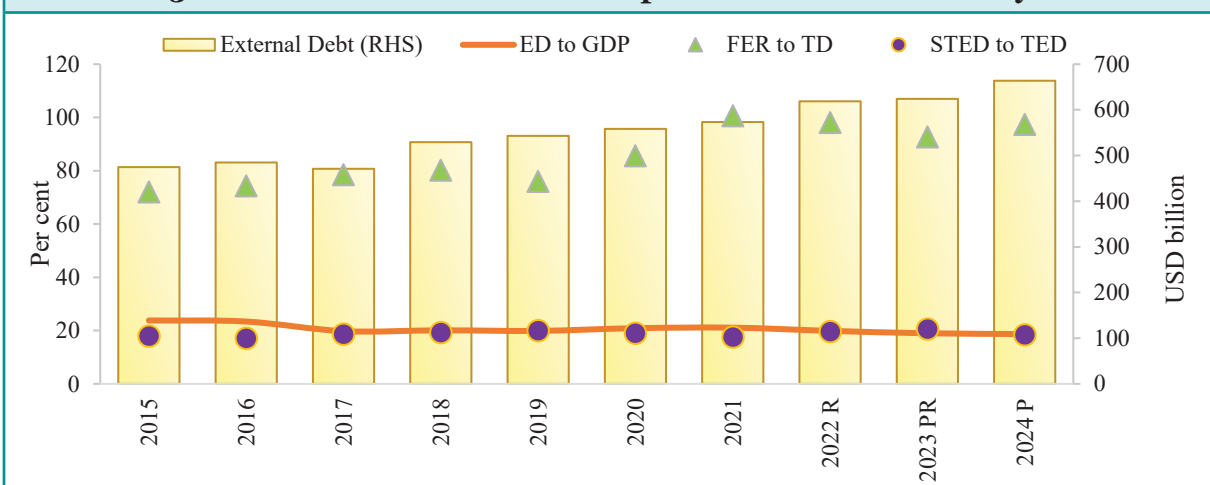
4.80 Thus, the net claims of non-residents in India, valued at USD 361.7 billion as of the end of March 2024, declined by USD 5.5 billion over the level of March 2023. India's international financial assets covered 74 per cent of international financial liabilities as of the end of March 2024.

STABLE EXTERNAL DEBT POSITION

4.81 The current account can also be expressed as the difference between national (both public and private) savings and investment. A current account deficit may, therefore, reflect a low level of national savings relative to the desired level of investment. External debt, by supplementing domestic savings, helps countries grow faster. In developing economies, high economic growth is typically associated with high external debt and vice-versa. However, an unsustainable large stock of external debt can potentially create vulnerabilities and dent growth prospects.

4.82 India has managed its external debt prudently with the overarching objective of keeping the current account deficit within sustainable limits and encouraging non-debt creation of external finance. India's external debt has been sustainable over the years, as evident in chart IV.38 below. The external debt to GDP ratio declined to 18.7 per cent at the end of March 2024 from 19.0 per cent at the end of March 2023. The share of short-term debt (with original maturity of up to one year) in total external debt declined to 18.5 per cent at the end of March 2024 from 20.6 per cent at the end of March 2023. The ratio of FER to total debt stood at 97.4 per cent as of March 2024.

Chart IV.38: India's stable external debt position and vulnerability indicators



Source: 'External Debt of India-Quarterly and India's External Debt-US Dollars (End March)', Statistics, External Sector, External Debt-RBI

Note: R-Revised, PR-Partially Revised, P-Provisional; ED-External Debt, FER-Foreign Exchange Reserves, TED-Total External Debt, STED-Short Term External Debt

4.83 Comparing various debt vulnerability indicators of India with peer countries for 2022 indicates that India is in a better position with relatively low levels of total debt as a percentage of Gross National Income (GNI) and short-term external debt as a percentage of total external debt. The comfortable level of FER offers additional comfort.

Table IV.3: India's key external debt indicators: A snapshot of stability

(Per cent, unless indicated otherwise)

End-March	External Debt (USD billion)	External Debt to GDP	Debt Service Ratio	Foreign Exchange Reserves to Total Debt	Concessional Debt to Total Debt	Short-Term Debt to Foreign Exchange Reserves	Short-Term Debt (original maturity) to Total Debt
2018	529.3	20.1	7.5	80.2	9.1	24.1	19.3
2019	543.1	19.9	6.4	76.0	8.7	26.3	20.0
2020	558.4	20.9	6.5	85.6	8.8	22.4	19.1
2021	573.4	21.1	8.2	100.6	9.0	17.5	17.6
2022 R	618.8	19.9	5.2	98.1	8.3	20.0	19.7
2023PR	624.1	19.0	5.3	92.7	8.2	22.2	20.6
2024 P	663.8	18.7	6.7	97.4	7.5	19.0	18.5

Source: Ministry of Finance

R: Revised, PR: Partially Revised; P: Provisional

OUTLOOK AND CHALLENGES

4.84 Though ongoing geopolitical headwinds impacted India's merchandise exports, lowering international commodity prices ensured a lower trade deficit in FY24 than in FY23. A narrowing merchandise trade deficit and rising service exports have improved the CAD, ending with a surplus of 0.6 per cent of GDP in Q4 of FY24. In the coming years, India's trade deficit is expected to decline further as the PLI scheme is expanded and India creates a globally competitive manufacturing base in several product categories. Further, the recently signed FTAs are expected to increase the global market share of the country's exports. Various international agencies and RBI expect the CAD to GDP to moderate to below one per cent for FY24, driven by growing merchandise and services exports and resilient remittances.

4.85 However, the risks to the performance of India's external sector are on the downside due to the persistence of current geopolitical tensions and policy uncertainty. Some of the challenges are mentioned below: -

- **Fall in demand from major trading partners:** As per the DGCIS data, the US was India's second-largest trading partner in FY24 after China. However, the USA's overall import volume declined by 1.7 per cent in 2023 compared to a growth of 8.6 per cent in 2022, as per OECD. This significantly influenced export growth in trading partners, including

India.¹¹⁵ Rising protectionism is another risk that could undermine trade recovery in 2024 and 2025.

- **Rise in trade cost:** Attacks on shipping in the Red Sea and drought in the Panama Canal have resulted in trade flows being re-routed, increasing journey time and costs as mentioned in para 4.8 above. India's merchandise trade relies heavily on maritime trade, so disturbances in major shipping routes can impact its economy. A CRISIL report¹¹⁶ highlighted that the Red Sea crisis has impacted the Middle East's fertiliser exports to India as imports of the Muriate of Potash from Jordan and Israel have been affected.
- **Commodity price volatility:** Fluctuations in commodity prices, especially for critical imports like oil, metals, and agricultural products, can impact India's trade balance and inflation levels. Disappointing global growth presents a downside risk, especially for industrial commodities. Additional trade restrictions could push food prices higher.
- **Trade policy changes:** Changes in trade policies by major trading partners or geopolitical developments can affect India's export opportunities and market access. As per the WTO's Trade Monitoring Report, November 2023¹¹⁷, the pace of WTO members' implementation of new export restrictions has increased significantly since 2020. 75 export restrictions on food, feed and fertilisers are still in place globally, in addition to 20 COVID-19-related export restrictions. For 2023, the trade covered by import restrictions in force was estimated at USD 2,480 billion, representing almost one-tenth of total world imports.

4.86 It is critical to explore what these changing paradigms mean for India. Policies need to be a mix that straddles security concerns with economic considerations. India's push towards manufacturing in complex and niche sectors through schemes such as PLI and Make in India aims to balance these goals. On the other hand, India's edge in services will catalyse our globalisation over the coming years. A recent paper by the Peterson Institute for International Economics¹¹⁸, asserts that globalisation in services is ongoing, even as we are past the era of hyperglobalised trade in goods. This implies that the global demand for India's services sector exports is here to stay.

4.87 India is simultaneously working towards unlocking the potential gains from growing integration by augmenting the logistics front. This is evident from the large infrastructure deals which have been signed to ramp up trade. For instance, the International North-South Transport Corridor (INSTC) is expected to shorten trade time for shipments to Russia and Europe. Another major joint infrastructure deal, the India-Middle East Europe corridor (IMEC), will connect Asia with Europe via ports and railroads. Similarly, there is a concerted effort towards striking trade agreements with countries spanning geographies.

¹¹⁵ OECD Economic Outlook, May 2024, <https://www.oecd.org/economic-outlook/may-2024/>

¹¹⁶ <https://tinyurl.com/2xf5cb6x>

¹¹⁷ WTO end year Trade Monitoring Report November 2023, https://www.wto.org/english/news_e/spno_e/spno42_e.htm

¹¹⁸ Ibid, Note 37.

4.88 Ultimately, India needs to focus on improving its competitiveness in many product areas. For example, India has tremendous potential in becoming a large global exporter in agricultural commodities. Fostering stronger regional trade ties and adding more markets for Indian goods will help mitigate global demand fluctuations. In an era when global economic growth is likely to be buffeted by geopolitical tensions and protectionism, growing India's exports of goods and services will be a stiffer challenge than before. Product safety and quality consciousness in the private sector and policy stability in the public sector are obvious starting points to turn the challenge into an opportunity.

MEDIUM TERM OUTLOOK: A GROWTH VISION FOR NEW INDIA

05

CHAPTER

The direct benefit of a 'Viksit Bharat' is the dignity of our citizens and the improvement in their quality of life."

- Extracted from Hon'ble Prime Minister's reply to the Motion of Thanks on the President's Address in the Lok Sabha on July 2, 2024

The Indian growth story over the last decade has been one of resilience. The structural reforms undertaken by the Government of India since 2014 have put the economy firmly on a growth path, and India is soon set to become the third-largest economy in the world. In the medium term, the Indian economy can grow at a rate of 7 per cent plus on a sustained basis if we can build on the structural reforms undertaken over the last decade. Against this backdrop, the chapter identifies the areas of key policy focus as well as presents a six-pronged growth strategy to achieve this goal. The strategy elucidated in the chapter is premised on the understanding that the structural reforms of the last decade, focused on the supply side of the economy, have to give way to next-gen reforms that are bottom-up in nature to yield strong, sustainable, balanced, and inclusive growth.

SETTING THE CONTEXT

5.1. In 1993, the Indian economy was valued at less than USD300 billion in dollar terms at current prices. Fast forward to 2024, and it is estimated to have reached a staggering USD 3.6 trillion. This represents a remarkable 12-fold increase despite the Indian rupee depreciating by around 3 per cent annually between 1993 and 2024. Moreover, this has been achieved without a big rise in the country's overall indebtedness, indicating an efficient utilisation of capital. India's per capita current dollar GDP has increased from 301.5 in 1993 to 2,484.8 in 2023,¹ which indicates a substantial improvement in the standard of living.

5.2. India is a historical and long civilisation. It provided answers to many questions that humankind faced and still faces. It is a country with a big land mass and a huge population. It rightly aspires to be reckoned with as a great power in economic and other terms. China, India's neighbour to the Northeast and a nation of comparable size and population and antiquity of civilisation as India, has grown to become a major global economic and political power in less than a generation. India, too, has now set for itself the goal of becoming a developed nation within a generation by 2047, the hundredth year of independence.

¹ World Bank, 2023 (<https://tinyurl.com/yeksmbde>)

5.3. Today, the world faces several major fault lines. We have arrived at a multipolar world. It is more difficult than the bipolar world that we were used to for nearly five decades after the War ended. Therefore, mini and significant geopolitical conflicts are likely in the coming decades.

5.4. At a cultural level, the rise of what is called the 'Far Right' by mainstream media in advanced nations is, in effect, a clash of priorities between globalist elites and others whose fortunes are bound by and tied to their national geographies. This clash of priorities transcends economics. It includes cultural and social preferences and values. Therefore, along with economic stagnation and geopolitical conflicts, societies in advanced nations are fracturing from within, too. The literature analysing long political, social, and civilisational cycles has warned us of a fairly to severely turbulent three decades until the middle of the century.

5.5. The idea of economic globalisation has run its course. It may not be reversed fully, but it has peaked. It will continue to face obstacles as economic policies worldwide pivot to the promotion of national champions for reasons too well-known to bear repetition here. Along with the peaking of globalisation, there is also a rethinking of the role of government in national economic strategy as inequality, poverty, and indebtedness have become pressing issues in the aftermath of the Covid pandemic. The clamour for easy answers to these global and generational challenges has provided an excuse for interventionist policies despite their poor empirical record in achieving prosperous or more equal societies.

5.6. Lastly, there is the crisis posed by climate change and global warming. Developed countries are pushing for a reduction in the emission of greenhouse gases into the atmosphere. With their policies having questionable effectiveness in achieving emission reduction in their own countries, they are ramping up pressure on developing nations. Developing nations are struggling to restore economic growth and reduce poverty and debt in their countries, all of which have been amplified by the COVID-19 pandemic. They lack both technology and financial resources to undertake the necessary transition to cleaner fuels. Developed nations are generous with pledges and parsimonious in delivering on them. Further, there are huge uncertainties as to the efficacy of drastic measures to combat climate change and their economic impact over the next half to a full decade. Slower growth, stagnation, or outright contraction might trigger social unrest and exodus of people to the West.

5.7. This is the global backdrop to India's growth, prosperity, and superpower aspirations for the next quarter century. In contrast, during its rise, China did not face many of these challenges, and even the ones they faced were fairly milder, in comparison. For realising India's aspirations, despite the changed circumstances, a good place to start is to acknowledge and recognise that the terrain has changed to be able to traverse through it and reach the destination.

5.8. India has to sustain its economic growth rate over a quarter century and do it sustainably, keeping the environment and climate in mind. Water stress looms large, as does air pollution. Life expectancy, much higher now than in the past, has stagnated in recent years. It has to educate and skill its youth to stay ahead of the curve so that they can work with emerging technologies while overcoming the accumulated education and skill deficits, accentuated by the pandemic, that make it harder to raise productivity even with the current state of technological

progress. It is required to maintain a constant vigil on its borders both in the Northwest and in the Northeast. With the digitalisation of the Indian economy, cybersecurity assumes a much higher degree of importance and urgency. Therefore, providing financial resources for national security is imperative. Fiscal resources have to increase without compromising on economic growth.

5.9. The capacity in terms of numbers and the capability of the State in terms of competence, skills, and attitude are additional factors that would determine the outcomes of India's economic and social goals. Economic policies have to be crafted in such a manner that they do not address issues narrowly or incompletely while rendering problems in other areas more intractable. Goals for a higher share of renewable power with its implications for land usage and dependence on inimical powers for resources are one example. The impact of farm sector policies on water security is another example.

5.10. With the global backdrop described earlier likely to come in the way of India boosting its exports at the same pace and level as East Asian countries and national security considerations likely to make foreign direct investment flows volatile year-to-year, India has to generate domestic resources mostly for its own investment and growth priorities. Geopolitics imposes its ceiling on external deficit and, consequently, external financing.

5.11. Against this background, the medium-term growth outlook for the Indian economy, which will be detailed in this chapter, is premised on the following key tenets:

- **First, increasing geoeconomic fragmentation and the consequent resource nationalism have significant growth-limiting impacts** on countries. It has given rise to a trade-off between efficiency and resilience that did not exist a decade earlier. Ensuring the security of supply through building buffers and slack has replaced the ability to operate at the frontiers of efficiency. 'Just in case' has replaced 'Just in time'.
- **Second, a global trust deficit is driving countries to pursue policies focused on enabling them to become self-reliant** and protect them from external shocks, especially in sectors of strategic importance. Therefore, the balance between inward-looking policies versus outward-looking policies needs to become more nuanced going forward;
- **Third, the integration of climate change strategies into national development policy and planning is not merely an environmental imperative but more,** as it impacts socio-economic stability, public health, banking, and public finances. Climate change imposes costs and requires policymakers to balance adaptation to climate change and emission mitigation. It also necessitates a trade-off between energy security and economic development on the one hand and energy transition on the other.
- **Fourth, for better and worse, technology is emerging as the biggest strategic differentiator** determining the economic prosperity of nations. Its productivity-enhancing potential is beyond doubt, but the social impact of emerging technologies such as Artificial Intelligence (AI) via labour market disruptions and labour displacement is barely understood. It also has the potential to skew the capital and labour shares of income in favour of the former.

- **Fifth, countries across the board have limited policy space to manoeuvre**, given the multiple crises confronting the global economy. Therefore, recognition and acceptance of trade-offs have become more necessary than before for policymakers.
- **Sixth**, in the last decade (2014-2024), the Government of India has pursued big-ticket reforms focused on restoring the health of the economy, elevating the potential growth by relieving supply-side constraints and strengthening its capabilities, capable of fulfilling the growth aspirations of the people in the present and the Amrit Kaal. The next stage is to ensure that these reforms are implemented correctly and this will require intense engagement with state governments, the private sector, and civil society. **Going forward, the Government's focus must turn to bottom-up reform and the strengthening of the plumbing of governance so that the structural reforms of the last decade yield strong, sustainable, balanced, and inclusive growth.**

KEY AREAS OF POLICY FOCUS IN THE SHORT TO MEDIUM TERM

5.12. Based on the state of the play of the Indian economy, both at a macro level and sectoral level, that has been elaborated in the rest of the chapters of this Survey, the present section draws out some of the key areas of policy focus to ensure that India's growth continues unimpeded, crossing the milestone of becoming the third largest economy of the world in short order, on its way to scaling greater heights.

5.13. **Generating productive employment:** Productive jobs are vital for growth and inclusion. India's workforce is estimated to be nearly 56.5 Crore, of which more than 45 per cent are employed in agriculture, 11.4 per cent in manufacturing, 28.9 per cent in services, and 13.0 per cent in construction². While the services sector remains a major job creator, the construction sector has been rising in prominence lately, driven by the government's push for infrastructure. However, since construction jobs are largely informal and low-paid, there is a need for avenues for the labour force leaving agriculture. Meanwhile, the manufacturing sector employment creation has been subdued in the past decade due to the legacy of bad loans and appears to have rebounded since 2021-22. According to UN population projections, India's working-age population (15-59 years) will continue to grow until 2044. The chapter on Employment (chapter 8) estimates that the Indian economy needs to generate nearly 78.51 lakh jobs annually in the non-farm sector to cater to the rising workforce. However, to create these many jobs, there is a need to create the conditions for faster growth of productive jobs outside of agriculture, especially in organized manufacturing and services, even while improving productivity in agriculture.

5.14. **Skill gap challenge:** Sixty-five per cent of India's fast-growing population is under 35, and many lack the skills needed by a modern economy³. Estimates show that about 51.25 per cent of the youth is deemed employable. In other words, about one in two are not yet readily employable, straight out of college. However, it must be noted that the percentage has improved from around 34 per cent to 51.3 per cent in the last decade⁴. The 2022-23 Annual Report of

² Ministry of Health and Family Welfare

³ Helping India build a skilled, inclusive, workforce for the future, World Bank, 2023 (<https://tinyurl.com/2tp4xpab>)

⁴ Bardhan, A and Routh, V. (2024). Tackling India's unemployment problem: Services, skills and symmetry, Observer Research Foundation, (<https://tinyurl.com/3uudbkms>)

the Ministry of Skill Development & Entrepreneurship (MSDE) highlights that “as per NSSO, 2011-12 (68th round) report on Status of Education and Vocational Training in India, among persons of age 15-59 years, about 2.2 per cent reported to have received formal vocational training and 8.6 per cent reported to have received non-formal vocational training”. The Annual Report further goes on to enumerate the challenges in the skilling and entrepreneurship landscape in the country, such as “: (i) Public perception that views skilling as the last option meant for those who have not been able to progress/have opted out of the formal academic system. (ii) Skill development programmes of the Central Government are spread across more than 20 Ministries/Departments without any robust coordination and monitoring mechanism to ensure convergence. (iii) Multiplicity in assessment and certification systems that leads to inconsistent outcomes and causes confusion among the employers. (iv) Paucity of trainers, inability to attract practitioners from industry as faculty. (v) Mismatch between demand and supply at the sectoral and spatial levels. (vi) Limited mobility between skill and higher education programmes and vocational education. (vii) Very low coverage of apprenticeship programmes. (viii) Narrow and often obsolete skill curricula. (ix) Declining labour force participation rate of women. (x) Pre-dominant non-farm, unorganized sector employment with low productivity but no premium for skilling. (xi) Non- inclusion of entrepreneurship in formal education system. (xii) Lack of mentorship and adequate access to finance for start-ups. (xiii) Inadequate impetus to innovation driven entrepreneurship. (xiv) Lack of assured wage premium for skilled people”. The Chapter on employment (chapter 8) provides a detailed analysis of the skill gap challenge and the efforts underway to address the same.

5.15. Tapping the full potential of the agriculture sector: Despite its centrality in India’s growth trajectory, the agriculture sector continues to face structural issues that have implications for India’s economic growth. The foremost concern confronting the sector pertains to sustaining agriculture growth without letting food price inflation rise beyond acceptable limits while incentivising farmers to raise production.⁵ There is also a need to improve price discovery mechanisms for agriculture products, increase efficiency, reduce disguised unemployment, address the fragmentation of landholding, and increase crop diversification, among a host of other issues. All of these call for the upgradation of agricultural technology, the application of modern skills in farm practices, enhancing agricultural marketing avenues, price stabilisation, the adoption of innovation in farming, lowering wastages in the use of fertiliser, water, and other inputs, and improving the agriculture-industry linkages. The chapter on agriculture (Chapter 9) discusses the policies being pursued by the Government to enable agriculture to tap its full potential.

5.16. Easing the compliance requirements and financing bottlenecks confronting MSMEs: MSMEs have played a key role in defining the economic trajectory of some of the major economies, such as Germany, Switzerland, Canada, China, etc. In India, the Government has been paying focused attention to enabling the MSME sector to occupy the centre stage in India’s economic story. However, the sector continues to face extensive regulation and compliance requirements and faces significant bottlenecks with access to affordable and timely funding being one of the core concerns. Licensing, Inspection, and Compliance requirements

⁵ Chand, R. (2019). Transforming Agriculture for the challenges of the 21st Century, 102 Annual Conference Indian Economic Association (IEA) (<https://tinyurl.com/4dpu7f9e>)

that MSMEs have to deal with, imposed particularly by sub-national governments, hold them back from growing to their potential and being job creators of substance. Threshold-based concessions and exemptions create the unintended effect of incentivising enterprises to cap their sizes below the thresholds. Therefore, threshold-based incentives must have sunset clauses. Further, many MSMEs struggle to secure the necessary funds to start, operate, or expand their business due to a variety of reasons including lack of collateral or credit history, high interest rates, complex documentation requirements, and long processing times, etc. The Lok Sabha Standing Committee on Finance, in its April 2022 report on ‘Strengthening Credit Flows to the MSME, noted that the credit gap in the MSME sector is estimated to be around Rs 20-25 lakh crore. The government has launched several schemes, such as the Pradhan Mantri Mudra Yojana and the Credit Guarantee Fund Trust for Micro and Small Enterprises, aimed at providing affordable credit to MSMEs. The initiatives have shown considerable promise in addressing these challenges. The Chapter on Industry (Chapter 10) discusses these issues in detail.

5.17. Managing India’s green transition: India has committed to reducing its greenhouse gas (GHG) emissions by 33-35 per cent (from 2005 levels), increasing the share of non-fossil fuel-based electricity to 40 per cent and enhancing forest cover to absorb 2.5 to 3 billion tonnes of carbon dioxide by 2030⁶. However, the path of green transition in India needs to (a) ensure the consistency of the E-Mobility policy with the required and optimal energy mix between traditional and renewable source; (b) ensure grid stability for E-Mobility to become pervasive; (c) develop or acquire storage technology at affordable costs for the share of renewable energy in power generation to rise; (d) reckon with the opportunity cost of land and capital being used for renewable energy given that India’s needs for land and capital far exceed their availability; (e) decide on the role and the share of nuclear energy in the energy mix; (f) recognise and deal with challenges posed by dependence on China for critical minerals, which are crucial raw materials needed for E-Mobility and renewable energy generation; (g) examine the implications of phasing down coal for bank balance sheets; (h) recognise and estimate the impact of phasing out of coal-fired thermal plants on the freight revenues of the Indian Railways and (i) study implications of replacing internal combustion engine vehicles with e-vehicles particularly on the sale of petrol and diesel and the tax revenues that such sale generates for the Union and State governments. Last but not least, India not only has to deal with climate change and undertake energy transition but also deal with the protectionism of the developed countries. Europe is on course to implement its Carbon Border Adjustment Tax and both the United Kingdom and the United States are in different stages of imposing their versions of it in due course. These taxes are in contravention to the spirit of the Paris Agreement that recognised ‘Common But Differentiated Responsibilities’.

5.18. Further, the overarching climate actions to achieve Intended Nationally Determined Contributions (INDC) goals require massive financial resources. Preliminary estimates indicate that the aggregate investment support required by India to achieve its 2070 net-zero target will

⁶ These goals are articulated in the government’s Intended Nationally Determined Contributions (INDCs) under the United Nations Framework Convention on Climate Change (UNFCCC) in Conference of Parties (COP 21) in Paris in 2015.

be USD 1.4 trillion at an average of USD 28 billion per year⁷. Raising financial resources for climate change adaptation and mitigation actions of this scale is an unprecedented challenge, especially given that India's climate action has been largely financed through domestic resources and the flow of international finance has been very limited. As per the Reserve Bank of India, bridging this substantial funding gap necessitates allocating 2.5 per cent of India's annual GDP to green finance. A 2022 report by the Climate Policy Initiative⁸ found that domestic sources accounted for the majority of green finance in India, at 87 per cent and 83 per cent in fiscal years 2019 and 2020, respectively. While international sources are increasing (from 13 per cent in FY 2019 to 17 per cent in FY 2020), they are still insufficient to meet India's net-zero target⁹. Mobilising substantial capital from traditional sources presents multifaceted challenges in emerging economies like India. The perceived sovereign risks associated with EMDEs and the capital-intensive nature of such projects, coupled with lengthy gestation periods and evolving regulatory frameworks, can create misalignment between investor expectations and project timelines. It is also pertinent to note that the flows of global capital to developing countries have been impeded by high costs of capital. Despite securing a good rating on its green bond framework, Indian sovereign green bonds have hardly received any 'greenium'¹⁰ from private investors. It is more a 'wall of capital' than a 'flood of capital' that is waiting to fund energy transition in EMDEs. It just isn't mobile. All of these together have severely hampered the flow of finance for green transition projects. The issues related to climate finance and India's green transition are discussed in detail in the chapter on Climate Change and Energy (chapter 6).

5.19. The Chinese conundrum: The dynamics of India-China economic relations continue to be extremely complex and intertwined. The Chinese domination over the global supply chains across product categories is a key global concern, especially in the wake of supply disruption accompanying the war in Ukraine. Even though India is the fastest-growing G20 country and is now recording growth rates that outpace China's, India's economy is still a fraction of China's. In the context of energy transition, China's near-monopoly over the production and processing of critical and rare earth minerals has already been a cause of global concern. It will also have significant repercussions for India's renewable energy programme, which is vulnerable because of its massive dependence on imported raw materials¹¹. Against this background, it may not be the most prudent approach to think that India can take up the slack from China vacating certain spaces in manufacturing. Indeed, recent data cast doubt on whether China is even vacating light manufacturing. The questions that India faces are: (a) Is it possible to plug India into the global supply chain without plugging itself into the China supply chain? and (b) what is the right balance between importing goods and importing capital from China? As countries attempt to reshore and friendshore, India's policy choices concerning China are exacting.

7 Singh, V and Sidhu, G. (2021). Investment sizing India's net zero target, Council on energy, Environment and Water (<https://tinyurl.com/yfz6wzdw>)

8 Landscape of green finance in India, Climate Policy Initiative, 2022 (<https://tinyurl.com/3p74wnb7>)

9 Report on Transition Finance by the Expert Committee on Climate Finance, International Financial Services Centres Authority, 2024 (<https://tinyurl.com/465yxd63>)

10 The 'greenium', or green premium, refers to pricing benefits based on the logic that investors are willing to pay extra or accept lower yields in exchange for sustainable impact. Source - UNDP, 2022 (<https://tinyurl.com/yks7cyr7>)

11 How renewables are shaping the India-China relationship, Institute of Peace and Conflict Studies, 2023 (<https://tinyurl.com/3u6rav84>)

Box V.I: The Chinese Manufacturing Juggernaut: A Threat to EMEs¹²

It is increasingly seen that emerging economies are introducing import restrictions on Chinese goods while accelerating a push for free trade elsewhere to protect their domestic manufacturers.

These protectionist measures directed against Chinese products are emerging due to the threat that the overcapacity in China's manufacturing sector is posing to other countries, especially in the EMDEs. China's manufacturing trade surplus has been ballooning since 2019 due to weak domestic demand and expanding industrial capacity. The mismatch between domestic supply and demand in China has widened in the past few years, leading to Chinese companies exploring additional markets overseas. This is leading to prices collapsing globally and driving other national producers out of business, especially in product categories where China dominates. For instance, the poor performance of China's property sector since 2021 created significant overcapacity leading to a collapse in global steel prices, which now puts significant pressure on producers in India, Vietnam, Brazil, and other countries. Estimates show that China's steel product exports are surging again—by 27 per cent so far in 2024—after 35 per cent growth last year.

China's dominance over a large number of product categories creates a risk of economic coercion, where the government restrains access to crucial inputs for political leverage. This is most evident in the case of the export of rare earth and critical minerals which are of high priority in the green transition efforts of countries. China's dominance also has led to monopolistic practices which has considerably limited the space for new entrants to emerge as new manufacturing powers. Recent research by Rhodium Group observes that "The Chinese government can encourage companies to partner together, merge and consolidate, coordinate to gain market shares, raise prices, restrict access to products where they already have substantial market power, or favour domestic firms in their suppliers and client networks."

It is also interesting to note that "while China still needs to import high-tech products from rich industrialized economies, it imports very few low-tech goods, where developing countries would have a comparative advantage. This is largely a result of deliberate policy interventions, which have intensified in recent years."

All these above factors have together played a key role in constraining the manufacturing sector of EMDEs. While EMDEs are resorting to import restrictions as a policy option to deal with the Chinese challenge, it is pertinent to note that some Chinese goods are so cheap that no amount of tariff can reduce their price competitiveness. Further, some Chinese products can move past these restrictions without being noticed since they are packaged in third countries. Meanwhile, China has started retaliating against these import restrictions which has further complicated the manufacturing landscape for EMDEs. For instance, in

¹² The contents of this Box is based on the article "Brazil, India and Mexico are taking on China's exports" that appeared in The Economist issue dated May 23, 2024 and the research from Rhodium Group on "How China's Overcapacity Holds Back Emerging Economies" accessed at <https://tinyurl.com/4kkdhctz>

response the India's anti-dumping probe against Chinese entities, China has been quietly blocking India's access to solar equipment. Given this, dealing with the Chinese manufacturing juggernaut will test the policy mettle of EMDEs. Developing countries will have to figure out a way of meeting the import competition from China and, at the same time, boosting domestic manufacturing capabilities, sometimes with the collaboration of Chinese investment and technology.

As the Rhodium group research points out, Brazil and Turkey recently raised tariffs on the import of E-Vehicles from China but, at the same time, took steps to attract Chinese FDI in the sector.

India has a similar decision to make, given its large bilateral trade deficit with China. It makes India vulnerable to potential abrupt supply disruptions. Replacing some well-chosen imports with investments from China raises the prospect of creating domestic know-how down the road. It may have other risks, but as with many other matters, we don't live in a first-best world. We have to choose between second and third-best choices.

In sum, to boost Indian manufacturing and plug India into the global supply chain, it is inevitable that India plugs itself into China's supply chain. Whether we do so by relying solely on imports or partially through Chinese investments is a choice that India has to make.

5.20. Deepening the corporate bond market: Going forward, the investment needed to steer India's economic growth has to be through a multitude of financing options beyond bank financing. India needs both banks and capital markets to provide the required finances sourced from a sustained high level of household savings. An active corporate bond market becomes critical in this context. An efficient corporate bond market with lower costs and quicker issuing time can offer an efficient and cost-effective source of longer-term funds for corporates. However, the size of the corporate bond market in India, scaled by GDP, remains small compared to other major Asian emerging markets such as Malaysia, Korea, and China.¹³ The Indian corporate bond market lacks depth since it is dominated by highly-rated issuers and a limited investor base of domestic institutions.

5.21. Tackling inequality: Globally, widening inequality is emerging as a crucial economic challenge confronting policymakers. The 2022 State of Inequality in India report¹⁴ observed that in India, the top 1 per cent accounts for 6-7 per cent of the total incomes earned, while the top 10 per cent accounts for one-third of total incomes earned. The Government places significant focus on this issue and all the critical policy interventions being undertaken with a focus on creating jobs, integrating the informal sector with the formal sector, and expanding the female labour force are aimed at effectively addressing inequality. Tax policies on the treatment of capital and labour incomes will likely play a more important role in the coming years, especially since the deployment of technology like AI may have a more deleterious impact on employment and income.

¹³ <https://www.bis.org/review/r220824c.pdf>

¹⁴ The State of inequality in India, Institute for Competitiveness, 2023 (<https://tinyurl.com/8ruecubn>)

5.22. Improving the quality of health of India's young population: The Indian Council for Medical Research, in its latest Dietary Guidelines for Indians published in April 2024¹⁵, estimates that 56.4 per cent of the total disease burden in India is due to unhealthy diets. The report also goes on to observe that the upsurge in the consumption of highly processed foods laden with sugars and fat, coupled with reduced physical activity and limited access to diverse foods, exacerbate micronutrient deficiencies and overweight/obesity problems. Estimates show that the adult obesity rate in India has more than tripled, and the annual rise in children's is the steepest in the world for India, behind Vietnam and Namibia, according to the World Obesity Federation¹⁶. The National Family Health Survey, 2019-2021 presents a very penetrating portrait of the health status of India's population (Box V.2). If India needs to reap the gains of its demographic dividend, it is critical that its population's health parameters transition towards a balanced and diverse diet.

Box V.2: India's expanding obesity challenge: Observations from National Family Health Survey (NFHS-5), 2019-2021

Obesity is emerging as a serious concern among India's adult population. According to National Family Health Survey 5 (NFHS-5), the percentage of men facing obesity in the age bracket 18-69 has increased to 22.9 per cent in NFHS-5 from 18.9 per cent in NFHS-4. For women, it has increased from 20.6% (NFHS-4) to 24.0% (NFHS-5). The spatial distribution of India's obesity challenge as per NFHS-5 vis-à-vis NFHS-4 reveals the following:

- In Tamil Nadu, for men, it is 37.0% (vs. 28.2% in NFHS-4), and it is 40.4% for women (vs. 30.9% in NFHS-4).
- In Uttar Pradesh, for women, it has gone up to 21.3% (NFHS-5) from 16.5% (NFHS-4), and for men, it has gone up to 18.5% (NFHS-5) from 12.5% (NFHS-4).
- In Kerala, for women, it has gone up to 38.1% (NFHS-5) from 32.4% (NFHS-4), and for men, it has gone up to 36.4% (NFHS-5) from 28.5% (NFHS-4).
- In West Bengal, for women, it has gone up to 22.7% (NFHS-5) from 19.9% (NFHS-4), and for men, it has gone up to 16.2% (NFHS-5) from 14.2% (NFHS-4).
- In Karnataka, the increase over NFHS-4 is 7% points for women (30.1% vs. 23.3%) and nearly 9% points (30.9% vs. 22.1%) for men.
- In Andhra, it is 36.3% for women (vs. 33.2%). However, for men, the number has dropped to 31.1% (vs. 33.5%).
- At 30.1% and 32.3%, respectively, the proportion of women and men who are overweight in Telangana has increased from 28.6% for women to 24.2% for men in NFHS-4.
- In Maharashtra, for women, it has remained the same across NFHS-4 and NFHS-5 at 23.4%, while for men, it has gone up to 24.7% (NFHS-5) from 23.8% (NFHS-4).

¹⁵ Dietary guidelines for Indians, ICMR- National institute of nutrition, 2024 (<https://tinyurl.com/ts6xejc4>)

¹⁶ Junk food's USD 30 Billion opening India's next health crisis, Bloomberg, 2023 (<https://tinyurl.com/52wtd7r9>)

- In Madhya Pradesh, for women, it has gone up to 16.6% (NFHS-5) from 13.6% (NFHS-4), and for men, it has gone up to 15.6% (NFHS-5) from 10.9% (NFHS-4).
- In Jharkhand, for women, it has gone up to 11.9% (NFHS-5) from 10.3% (NFHS-4), and for men, it has gone up to 15.1% (NFHS-5) from 11.1% (NFHS-4).
- In Bihar, for women, it has gone up to 15.9% (NFHS-5) from 11.7% (NFHS-4), and for men, it has gone up to 14.7% (NFHS-5) from 12.6% (NFHS-4).
- In the NCT (Delhi), the proportion of women with obesity is 41.3% (vs 33.5%), and for men, it is 38.0% (vs 24.6%).

At the All-India level, a quick perusal of the data shows that the incidence of obesity, as per NFHS5, is significantly higher in urban India than in rural India (29.8% vs. 19.3% for men and 33.2% vs. 19.7% for women). Combined with an ageing population in some states, obesity presents a concerning situation. Preventive measures must be taken to enable citizens to have a healthier lifestyle. Here, it is pertinent to note that the NFHS-5 Survey overlapped with the Covid-19 pandemic. Therefore, with restrictions on outside activities and lockdowns, sedentary lifestyles may have become more entrenched, resulting in the obesity proportion going up much more in NFHS-5. If the trend reverses in NFHS-6, it will be a healthy sign.

GROWTH STRATEGY FOR AMRIT KAAL: STRONG, SUSTAINABLE AND INCLUSIVE

5.23. The policy reforms that the Government of India has been following over the past decade have laid the foundation for sustained moderate to high growth in the coming years. To sustain growth for nearly a generation up to 2047 or more and to ensure that it makes people's lives better and fulfills their aspirations, bottom-up reforms are necessary. This section presents a six-pronged growth strategy that can guide the bottom-up reform process going forward.

5.24. **Strategy for boosting private sector investment:** India's private gross fixed capital formation must accelerate in Machinery & Equipment and Intellectual Property products so that quality jobs can be created. The focus of the Government should be on creating an enabling policy and regulatory environment for the upgradation of capacity and know-how of component manufacturers, increasing the availability of trained human resources, addressing resource bottlenecks and regulatory impediments, etc. Capital formation in the private sector, after the consolidation in the second decade due to balance sheet issues, has begun to recover post-Covid. Nonetheless, there is significant scope for boosting India's private investment, especially in the context of investment requirements facing the Indian economy in the areas of infrastructure, green transition, etc. The Government of India has undertaken significant initiatives in this direction, which include Aatmanirbhar packages, the introduction of the Production Linked Incentive (PLI), investment opportunities under the National Infrastructure Pipeline (NIP) and National Monetisation Pipeline (NMP), India Industrial Land Bank (IILB), Industrial Park

Rating System (IPRS), the soft launch of the National Single Window System (NSWS)¹⁷, etc. The focus needs to be on the implementation of these measures with a target of putting the Private Sector Non-Residential Investment (including equipment, structures, software, and R&D) on a sustainable footing so that it can catalyse the efforts towards increasing investment to 35 per cent of GDP.

5.25. Strategy for the growth and expansion of India's Mittelstand¹⁸: Strengthening India's MSME sector is central to India's growth in the coming years. MSMEs are the backbone of the Indian economy, contributing approximately 30 per cent of the country's GDP, 45 per cent of manufacturing output, and providing employment to 11 crore of India's population¹⁹. The Government of India has been proactive in boosting the growth of the MSME sector, through initiatives such as the allocation of ₹ 5 lakh crore Emergency Credit Line Guarantee Scheme (ECLGS) for businesses, including MSMEs; equity infusion of ₹ 50,000 crore through the MSME Self-Reliant India Fund; New revised criteria for the classification of MSMEs; rollout of Raising and Accelerating MSME Performance (RAMP) programme with an outlay of ₹ 6,000 crores over 5 years; Launch of Udyam Assist Platform (UAP) on 11.01.2023 to bring the Informal Micro Enterprises (IMEs) under the formal ambit for availing the benefit under Priority Sector Lending (PSL)²⁰. These initiatives have been formulated keeping in mind the key challenges the sector faces, primarily for access to timely and affordable credit. Important though it is, however, financing is only one of the key challenges that the sector faces.

5.26. Going forward, for the *Mittelstand* to expand, **deregulation is a vital policy contribution.** That is why the revival or creation of institutional mechanisms for dialogue with states on required policy changes is essential. Much of the action has to happen at the level of sub-national (state and local) governments. **Physical and digital connectivity (industrial and freight corridors), infrastructure upgrade and development, the introduction of bullet trains,** and the manufacture of semiconductor chips will contribute to the growth of the sector through the supply-chain network and the growth of ancillary industries that they catalyse, apart from the inspirational effects that projects such as building semiconductor fab and introducing a bullet train will have when they are operational. MSME entrepreneurs also need training in critical areas of enterprise management, such as human resource management, financial management, and technology. These interventions have to be targeted, tailored to the circumstances of each sector, and practical rather than academic. The productivity of owner-entrepreneurs unleashed by such training will be immense.

5.27. Export strategy is also a crucial component of elevating the manufacturing share of GDP and growing the country's *Mittelstand*. For instance, '**Make in India Mittelstand (MIIM),**' a collaboration between India and Germany, focuses on driving innovation and enhancing economic cooperation by encouraging small and medium-sized German companies to invest

17 PIB press release of Ministry of Commerce & Industry dated 9th Aug, 2023 (<https://tinyurl.com/yaxwv8xy>)

18 Mittelstand commonly refers to a group of stable business enterprises in Germany, Austria and Switzerland that have proved successful in enduring economic change and turbulence. It is usually defined as a statistical category of small and medium-sized enterprises with annual revenues up to 50 million Euro and a maximum of 500 employees, (<https://tinyurl.com/mrxkz5sm>)

19 Invest India, 2023 (<https://tinyurl.com/56393ekz>)

20 PIB press release of Ministry of Micro, Small & Medium Enterprises dated 7th Aug, 2023 (<https://tinyurl.com/4m465t7c>)

and manufacture in India. Since its inception in September 2015, the MIIM programme has supported more than 151 German Mittelstand companies, resulting in a total declared investment exceeding €1.4 Bn in India²¹, as of August 2021. A majority of these investments came in the automotive, renewables, construction, consumer goods, electronics and electricals, chemical, and waste/ water management sectors. Striking the right balance between the trilemma of trade with China, investment by China, and India's territorial and non-territorial integrity and security is part of the strategy of growing India's Mittelstand.

5.28. Strategy for removing the growth impediments in the agricultural sector: The importance of the agriculture sector in the Indian economy and the impediments confronting the sector have been discussed in detail in the literature. Agriculture is at the nexus of three of the greatest challenges of the 21st century – sustaining food and nutrition security, adaptation and mitigation of climate change, and sustainable use of critical resources such as water, energy, and land. Agriculture and allied sectors such as horticulture, livestock, fisheries, and dairy and activities such as food processing hold significant potential for gainful employment. Given the geopolitical and technological threats that both manufacturing and service sectors face, it makes immense sense to do whatever it takes to realise the latent employment potential in agriculture. It is both urgent and important for India to re-imagine the contours of its primary sector for the next generation. India may have to abandon the old development playbook of moving on from agriculture to industry and services as economic development matures. Far from fading away with economic development as has happened with other countries in the past, in the changed geopolitical and evolving climatic circumstances, it may have a very important role to play in India's physical, food, and economic security.

Box V.3: A farmer-friendly policy framework

The Indian agriculture sector is a success story. The country has come a long way from being a food deficit and importing country in the Sixties to being a net exporter of agricultural products. At the same time, it is important to recognise that India has a good scope to enhance value addition in agriculture and make employment in agri-value chains both remunerative and attractive among Indian youth. Unlike East Asian economies and developed countries of the West, India has yet to fully exploit the potential of agriculture to contribute to economic growth and employment generation.

Indian agriculture is not in a crisis now but requires a serious structural transformation because climate change and water criticality loom large in the times to come. The surge in agricultural employment in Covid years due to reverse migration, the decline in the growth rate of value addition in agriculture in FY24, and an extremely hot summer in the Northwestern and central regions of the country in the summer of 2024 with rising water stress and energy consumption make a serious and honest stock-taking of India's farm sector policies imperative. If we grasp the nettle, then the chances of enhancing the contribution of the farm sector to national food and nutritional security, as well as economic prosperity in rural India, go up considerably. Higher and well-shared prosperity in the rural economy can

²¹ Invest India, 2024 (<https://tinyurl.com/23nsxy4b>)

help spur much-needed demand for industrial goods, thus spurring a manufacturing sector take-off. Thus, agriculture has a much higher multiplier effect on overall GDP than indicated by its direct contribution.

In a growing economy, the share of agriculture declines over time. That is normal. That is considered progress. Households, as their incomes rise, do not consume more food proportionately. The share of food in their consumption expenditure goes down, famously regarded as Engel's law. However, it does not mean that food is less consequential to their well-being. Within food, the expenditure on nutritious food (protein and vitamins) such as livestock products (milk and meat), fish, fruits, and vegetables goes up, which is in line with what is known as Benette's law.

Agriculture and farmers matter for a nation. Most countries understand that. India is no exception. India subsidises their water, electricity, and fertilisers. The former two are provided virtually free. Their incomes are not taxed. The government offers them a minimum support price (MSP) for 23 selected commodities. Monthly cash support is offered to farmers through the PM-KISAN scheme. In the past and in some cases, even now, Indian governments – national and sub-national – have waived their loans. So, governments in India spend enough resources to look after the farmers well. Yet, a case can be made that they can be served better with some re-orientation of existing and new policies.

Farm products are doubtless subject to the interplay of market forces. If anything, the relative inelasticity of food consumption works in their favour. This creates a conundrum. Prices rise when weather or other factors adversely impact the harvest. Farmers respond by increasing the area under cultivation for the next year, leading to a glut in supply, which drags down prices. On both occasions, farmers fail to reap any rewards – because of inadequate produce in the first instance and lower prices in the second.

Another risk for farmers is when output drops due to drought or drenching at harvest time. Prices rise, but the farmer is unable to benefit from the produce because it is inadequate. So, farming needs insurance. The challenge is to figure out the best forms of insurance and price support for farmers that do not distort incentives and create other costs for the economy, such as excessive water consumption, depletion of groundwater, soil quality erosion, and, equally, health costs through indirect encouragement of excess consumption of carbohydrates.

In theory, this insurance can come in the form of price support or income support. Price support interventions include direct price floors like the Minimum Support Price (MSP) or price-gap support like the Bhavantar Bhugtan Yojana that Madhya Pradesh experimented with in one season but gave up subsequently. Income support in the form of direct benefit transfers (DBT) like the PM KISAN is the preferred form of agriculture subsidy in many developed countries. Crop insurance, like the Prime Minister's Fasal Bima Yojana (PMFBY), is another form of income support, though it has a mixed record globally.

Given the vagaries of weather and the inherent difficulties of responding to prices promptly, there is an economic and moral case for farmers to be supported when market prices fail them. At the same time, farmers must have the freedom to benefit from market prices when market prices operate in their favour.

This often puts governments in the horns of a dilemma because, in relatively low-income countries, the interests of low-income consumers matter. Therefore, in addition to supporting farmers, governments are forced to intervene in the market to stabilise prices through policies like open market sales, trade controls, and measures against hoarding and speculation. In India, these measures come on top of the massive Public Distribution System (PDS) that underpins food security for the vast majority of the population, especially the poor and vulnerable.

However, such price stabilisation measures aimed at consumers often conflict with income-support policies for the farmers. Governments have no option but to do a delicate balancing act. Here, the combination of policies becomes important. It is about a basket of policies that serve the interests of both farmers and consumers. There is a strong case here that both with farmers and consumers, income top-ups, i.e., direct cash transfers, are more effective. Direct transfers allow the markets to function.

How do we let the markets function in the interests of the farmer? What can governments do?

(1) By not banning futures or options markets at the first sign of price spikes.

These markets do not hurt consumers or farmers at all times. The bar for such bans must be set so high that their recourse must be almost non-existent. The intelligent regulatory design of such markets can obviate the need for bureaucratic interference in the futures market for agricultural commodities.

(2) By invoking export bans only under exceptional circumstances and allowing domestic consumers to substitute, especially if the agricultural commodities in question are not essential consumption items such as foodgrains. Even in those cases, the government can allow substitution effects to play out before responding to domestic supply concerns. For example, if sugar prices rise, consumers can consume less of it or switch to jaggery. It may even be a good thing for their health. In general, it is far easier for consumers to substitute or pare back consumption than for farmers to endure big losses because of ad hoc export bans or huge imports.

Farmers should be allowed to benefit from higher international prices. Bans on food exports also need to be telegraphed in advance lest hunger and famine elsewhere in the world worsen.

(3) By re-examining the inflation-targeting framework. Food constitutes a very high portion of the consumer price index in developing countries. That is par for the course. Hence, when central banks in developing countries target headline inflation, they effectively target food prices. So, when food prices rise, inflation targets come under threat. Therefore, the central bank appeals to the government to bring down the increase in the prices of food products. That prevents farmers from benefiting from the rise in terms of trade in their favour. India's inflation targeting framework should consider targeting inflation, excluding food. Higher food prices are, more often, not demand-induced but supply-induced. Short-run monetary policy tools are meant to counteract price pressures arising out of excess aggregate demand growth.

Deploying them to deal with inflation caused by supply constraints may be counterproductive. Therefore, it is worth exploring whether India's inflation targeting framework should target the inflation rate excluding food. Hardships caused by higher food prices for poor and low-income consumers can be handled through direct benefit transfers or coupons for specified purchases valid for appropriate durations.

- (4) Specifically, with reference to India, **by increasing the Total Net Irrigated Area.** Several states are well below the national average. Investment in irrigation may make monsoon-watching a non-event, but it would enhance farmers' income security. Not only that, as in the case of power generation plants where the plant load factor has scope for improvement, India's irrigation efficiency can also improve. It is only 30-40 per cent for surface water and 50-60 per cent for groundwater. This calls for better water utilisation farming practices and technologies like drip and fertigation. It will help raise productivity and cut down water and fertiliser use by almost 50 per cent.
- (5) Besides these, **by making farming consistent with climate considerations.** India produces too much foodgrains and sugar, too few pulses, oil seeds, and other cash crops. Grains such as rice and sugarcane are water-guzzling crops. Water criticality is escalating in India. Further, among foodgrains, the cultivation of paddy gives rise to methane emissions. Its methane emission potential is considerable. Sometimes, and under some conditions, Direct Seeded Rice (DSR) or even organic farming for some crops could help save water and chemical fertilisers. It is also important to recognise that India has achieved relative self-sufficiency in basic staples and has emerged as the largest exporter of rice in the world (almost 40 per cent of world exports in 2022-23). Exporting 20 MT of rice means at least exporting 40 billion cubic meters of water. At home, the Food Corporation of India currently has rice stocks that are more than three times the buffer stock norm. Excessive production of rice results from large subsidies for power for irrigation, water, and fertilisers. The time has come to promote 'crop-neutral incentive structures.' That would imply that pulses, oilseeds, and millets that save on power, water, and fertilisers need to be rewarded with equivalent subsidies embedded in rice production.

Further, the need of the hour is to move from basic food security to nutritional security. We need more pulses, millet, fruits and vegetables, milk and meat for that. Importantly, their demand is growing much faster than that of basic staples. So, farm sector policies should align more with a 'demand-driven food system' that is more nutritious and aligned with Nature's resource endowments.

In sum, there is a need to take a holistic view of these diverse considerations, such that economic policies, in general, and farm policies, in particular, benefit farmers and are compatible with priorities related to health, water, and climate.

Given India's natural competitive advantages, agriculture and allied sectors have immense scope to contribute to employment and economic growth. Policies that enhance the economic viability of farming, ensure food and nutritional security, and place it on an economically, climatically, and environmentally sustainable footing will attract private sector investment

and pave the way for higher value addition by the sector while allowing public resources to be deployed in health, education, and skilling.

Hence, striving to achieve consensus with wide stakeholder consultations on the various issues in the sector is a multi-bagger in terms of the economic and social returns on the investment of effort.

5.29. Strategy to secure the financing of green transition in India: Given the climate financing needs confronting India, there is a need to exploit the rapidly growing pool of global green capital from sovereign wealth funds, global pensions, private equity, and infrastructure funds. Ways to do so include addressing barriers to investment in transition projects, fostering a sustainable finance ecosystem, and diversifying funding sources. There is also the need for innovative and tailored approaches to effectively channel funds into green finance. For instance, blended finance, which strategically integrates public and private capital, holds the potential to attract private sector involvement, mitigate investment risks, and enable the rapid and scalable deployment of resources needed to successfully transition to a sustainable, low-carbon economy. Furthermore, as India shifts to low-carbon energy to meet its environmental goals, sector-specific financial institutions can also help to mobilize green funds. Their specialized knowledge of the sector (especially the hard-to-abate sector) enables them to create innovative financial products tailored to transition projects' unique requirements. By directing investment to green initiatives, these institutions can drive the transition to cleaner energy, contributing not only to reducing carbon emissions but also to a more sustainable and resilient energy future. There is significant potential for enhancing the role of the International Financial Services Centres Authority (IFSCA) which can act as a conduit for attracting international capital crucial to fill India's climate finance gap. The Report on Transition Finance by the Expert Committee on Climate Finance has submitted their recommendations which can provide a roadmap for IFSCA to develop a climate finance ecosystem and instruments. India also can engage with multilateral development banks and explore the use of new and existing instruments that they have to offer to raise necessary finance which can be ploughed back into financing India's green transition goals.

Box V.4: Leveraging Market Finance: India's Catalytic Use of Multilateral Investment Guarantee Agency (MIGA)

India's economic trajectory towards higher middle-income status is reflected in how the country is evolving in its use of development finance from the World Bank Group. As a founding member of the World Bank, India became the dominant user of the International Development Association (IDA) – the primary source of concessionary financing from the World Bank. With increasing income growth, India graduated from the IDA concessionary financing to accessing funding through the World Bank's more commercial IBRD window and, in the process, becoming a contributor to IDA. As India begins to approach the borrowing limits for an IBRD country and given the planned investments in human capital, climate transition, and infrastructure, the country now needs to again shift its approach on how to best use multilateral finance. Today India needs to access market finance at scale to fuel its economic growth. In this context, India is drawing on the Multilateral Investment

Guarantee Agency (MIGA) of the World Bank Group to directly access financial markets on competitive terms by using the multilateral as a mechanism to leverage market finance in addition to drawing on its traditional role as a lender of multilateral finance.

Two MIGA guarantee operations have already been completed this fiscal year. MIGA provided a credit enhancement guarantee to Japan's MUFG investment bank for their commercial loan of \$100 million to the Dedicated Freight Corridor Corporation of India Limited (DFCCIL). It will enable DFCCIL to complete the Ludhiana-Khurja and Kanpur-Mughalsarai sections of the Eastern Dedicated Freight Corridor (EDFC), and the last mile connectivity between the freight corridor and multimodal logistics terminals. The commercial finance is being executed through GIFT City in Gujarat, where MUFG has opened a centre. In addition, MIGA provided credit enhancement guarantees to Citi, Standard Chartered Bank, and Credit Agricole for their commercial loans totaling US\$200 million, which was used to partially replace an existing US\$500 million IBRD loan to the State Bank of India (SBI). The IBRD loan was provided to SBI in 2016 as part of the Grid Connected Solar Rooftop²² Program to deliver rooftop solar systems to commercial and industrial customers across India.

Both operations reflect India's commitment to a green, economic growth strategy. The freight corridor is a much more efficient mode of transportation relative to road transport and reduces millions of tons of greenhouse gas emissions (GHG) each year. The SBI's financing of solar PV program provides clean, renewable energy and reduces greenhouse gas emissions by displacing thermal generation. For both programs, India used IBRD loans to finance the early phase of infrastructure development – allowing the operations to become commercially bankable – before replacing it with market financing backed by MIGA. In effect, IBRD investment helped the infrastructure investments cross the green-field risks, making the MIGA-backed market financing competitive with IBRD and, at the same time, allowing IBRD funds to be released for reinvestment in new development projects. The MIGA guarantee allowed DFCCIL to borrow internationally under commercial terms for the first time, thereby diversifying the SOE's financing options. For SBI, the guarantees also reduced its cost of borrowing and diversified its sources of funding. Importantly, in using MIGA, India is following one of the main recommendations of the report written under its G-20 Presidency, calling for the World Bank Group to play a greater role in leveraging market finance for middle-income countries.

5.30. Strategy towards bridging the education-employment gap: Skill development is at the centre of changes happening in education and labour markets amid the global megatrends, such as automation, action against climate change, the digitalisation of products and services, which are changing the nature of work and skills demands. With one of the youngest populations, a median age of 28, India can harness its demographic dividend by nurturing a workforce that is equipped with employable skills and prepared for the needs of the industry. Elevated levels and superior standards of skills help countries adeptly navigate the challenges and opportunities present in both domestic and international job markets. India has not only

²² MIGA Supports innovative solar rooftop systems in India, Press release by World Bank Group, 2024 (<https://tinyurl.com/3x3yrj42>)

recognised the potential of its young workforce but also the issues associated with skilling such a vast population. The National Policy on Skill Development & Entrepreneurship (NPSDE) focuses on bridging gaps, improving industry engagement, establishing a quality assurance framework, leveraging technology, and expanding apprenticeship opportunities. Prioritising equity, it targets marginalised groups and emphasises skill development and entrepreneurship for women. In the entrepreneurial domain, the policy educates potential entrepreneurs, facilitates mentorship, fosters innovation, enhances ease of doing business, and promotes social entrepreneurship. This, in combination with the National Education Policy (NEP), holds tremendous potential for bridging the education–employment gap in India. However, skills are acquired on the foundations built by the education system, especially at the schools. Therefore, schooling should focus on the basic requirement of foundational literacy and numeracy and the realisation of grade-appropriate learning outcomes. The NEP 2020 and NEP 2023 provides a good framework to realise this objective. It serves as a stimulus for reforming the educational system to increase the employability of the future generation. Implementing the NEP is key to achieving educational outcomes and preparing the youth for participating in the knowledge economy. In addition, new skilling initiatives and revamping the existing skilling initiatives should continue to be of high priority to the Government. The industry itself has much to gain from taking the initiative on this matter with academic institutions rather than leaving it only up to the governments – union and states – to do the heavy lifting. Indeed, it should be the other way around.

5.31. Strategy towards building state capacity and capability: Since 2014, India has made significant strides in delivering crucial infrastructure and implementing direct benefit schemes aimed at enhancing citizens' well-being. The civil service has been at the heart of these transformative efforts. The civil service's ability to design policies and ensure that initiatives reach all citizens has been critical to the success of these programs. However, sustaining and accelerating India's progress in the face of evolving challenges requires the state machinery to reimagine, reinvent, reinvigorate, and re-equip itself. After eighty years of relative stability post-WW II, it appears that convulsive change is in store in global affairs. It is unlikely to leave too many areas untouched – diplomacy, security, and domestic socio-economic development. At senior levels, the country will need the combined wisdom, knowledge and experience of both the generalists and specialists. Civil Service provides the former and the private sector the latter. In recent years, the Government has made a significant beginning in lateral entry into the senior ranks of Central Ministries through a transparent process. This needs to be substantially expanded. It is one way to plug the gap because the need for diverse skills and mindsets will only keep expanding in the coming years. Foundational and mid-career training for civil servants in all specialities has to be re-imagined for the recharging and rebooting of skills, aptitude and attitudes. Length of tenure too is critical to grow into the demands of, and be productive and purposeful, in senior roles. Accountability mechanisms and practices will become necessary, if not already, to ensure policy outcomes at scale and speed. Annual conversations on goals and measurement – at the beginning and the end of the year – at senior levels will usher in professionalism and accountability. While, in theory, the desirability of such a practice is not in doubt, these mechanisms and practices will themselves require many iterations for a better understanding of their feasibility, limitations, and utility to evolve before they are institutionalised more permanently.

Box V. 5: Mission Karmayogi's holistic approach to building state capacity in India

The First and Second Administrative Reforms Commission (ARC) reports had identified several barriers to improved capacity of the civil service. These included departments implementing policies in silos,²³ poor communication, strict information boundaries, and lack of collaboration which resulted in duplicate efforts and inefficient resource allocation.²⁴ Undergirding this structure was a personnel management system that hampered the capacity and motivation of civil servants to work efficiently. Under-resourced training institutes and infrequently updated training programs did not provide officials with the skills and specialisation they needed to grow professionally and meet the changing needs of public administration.^{25,26} Performance management systems were not equipped with the proper mechanisms to assess, reward, and improve performance, and to align officials' capacities with the needs of the system.²⁷ Challenging work environments and lack of mentorship led to reduced motivation to excel at work.²⁸

Addressing these problems has required looking beyond a single, definitive solution. In their seminal paper on the challenges of policy-making in diverse societies, Rittel and Webber (1973) propose that problems of public policy planning are 'wicked': they are inherently complex, multi-faceted, and resistant to straightforward solutions.²⁹ They comprise multiple smaller problems and concern multiple actors, often with competing priorities. There is no clear point at which a problem of this nature can be said to be solved and no ideal solution for it. The government has responded to the wicked challenge of building state capacity by launching Mission Karmayogi, which deconstructs the problem into more tractable sub-components. The program endeavours to enhance state capacity using the 'Workforce-Work-Workplace' framework to address each level of the civil service as well as the linkages and interactions between them.³⁰ It provides a multi-pronged solution encompassing:

- Building the capacity of the **Workforce** centred on their roles and associated competency requirements at multiple career stages
- Improving the quality of the **Work** through role-based human resource management and decision-making
- Enhancing the **Workplace** through mentorship, better managerial practices, and improved physical infrastructure

²³ First ARC, Report on Machinery of Government of India and its Procedures of Work, 1968, Chapter II, Section 2.2

²⁴ Second ARC, Twelfth Report on Citizen Centric Administration: The Heart of Governance, 2009, Chapter 2, Section 2.6

²⁵ Second ARC, Twelfth Report on Citizen Centric Administration: The Heart of Governance, 2009, Chapter 2, Section 2.6

²⁶ Second ARC, Tenth Report on Refurbishing of Personnel Administration – Scaling New Heights, 2008, Chapter 4, Section 4.1

²⁷ *ibid.*, Chapter 5, Section 5.2

²⁸ *ibid.*, Chapter 7, Section 7.4

²⁹ "Dilemmas in a General Theory of Planning," Horst W. J. Rittel and Melvin M. Webber, *Policy Sciences* 4, no. 2 (1973): 155-169.

³⁰ Mission Karmayogi: A Silent Revolution, R. Balasubramaniam *Journal of Governance* 25 (July 2022), (<https://tinyurl.com/ysevk6ut>).

By connecting workplace roles and workers' competencies, Mission Karmayogi builds a much-needed bridge between capacity building and human resource management systems. Competencies are the attitudes, skills, and knowledge that are essential for a civil servant to perform their role successfully. As officials evolve in their careers, the competencies they are required to possess also evolve. Through Mission Karmayogi, the government is delineating the competency requirements for all civil servants in terms of their roles and duties, as well as the four Gunas or overarching virtues of civil servants as highlighted in the Karmayogi Competency Model.³¹ Competencies then become a key tool for enhancing the performance of civil servants. Once competencies have been specified, they can be assessed using several measures, including workplace performance assessments, data from digital MIS systems, and 360-degree feedback mechanisms. This would enable the government to provide calibrated capacity-building support and identify the right person for the right role in government.

Capacity-building programmes, both in terms of pre-service training and ongoing professional development, can be designed to build the specific competencies that a civil servant needs to perform their role well. This also creates the space to expand beyond conventional training programs to draw on a range of approaches that are grounded in evidence-based adult learning principles, such as immersion programs, exposure visits, case studies (through the use of Amrit Gyaan Kosh³²), and self-paced and technology-enabled learning. To achieve this at scale, technology-enabled capacity building will allow officials across cadres, states, and seniority to steer their professional development. The iGOT Karmayogi platform is rapidly shaping into a central node that enables civil servants to access tailored and need-based capacity-building modules, track their competency requirements and gaps, and share knowledge and learnings across departments.

In tandem with capacity building, Mission Karmayogi is also introducing a role-based human resource management system that would allow the government to match civil servants with roles based on the competencies they possess and the requirements of the role. Decision-making around postings, transfers, and promotions can then be guided by civil servants' demonstrated competencies and experience. This is a significant shift from the current rule-based approach, which will generate better incentives for performance among civil servants. Access to the universe of capacity-building resources - and not just what is considered relevant for their level - will enable civil servants to proactively plan their professional journeys within government in a manner that aligns with their areas of interest and expertise.

³¹ The Karmayogi Competency Model is a public human resource management framework developed by the Capacity Building Commission of India. The framework is built on four elements: self-awareness of one's own strengths and weaknesses, collaboration and inclusion of diverse voices towards a shared goal, transparency and compliance with the rules and regulation as well as Knowledge of systems and processes, and citizen-centricity and the motivation to transform citizens' lives through one's work.

³² Developed by the Capacity Building Commission of India, Amrit Gyaan Kosh is a dedicated knowledge bank for civil servants which houses teachable case studies, policy simulations, and interactive and immersive learning resources.

Civil servants with enhanced capacities and improved fit for their roles will constitute high-performing and efficient teams. This will be accompanied by investments in building great workplaces for civil servants, characterised by a culture of motivation, shared purpose, and trust, and supported by stronger knowledge management systems. Senior civil servants will provide mentorship and guidance to early-career civil servants. Some of this is already happening in pockets but these practices will be more widely institutionalised. Upgrades to physical infrastructure will also support civil servants to boost their performance, while technology-enabled workplaces will improve efficiency and collaboration. Further, technological infrastructure, data, and workflow systems will strengthen institutional memory, providing a knowledge base to plan and implement a long-term vision for the social and economic performance of the nation.

OUTLOOK IN THE MEDIUM TERM

5.32. The Indian growth story over the last decade has been one of resilience. The country has weathered the onslaught of multiple global crises because the government dealt with them deftly by forging a recovery strategy that was uniquely designed to address the concerns of citizens while ensuring that the growth momentum continued to be sustained through a wide range of structural reforms. India's strength has always been its institutions, and, many a time, the institutional strength has enabled the country to wade through multiple challenges.

5.33. The structural reforms undertaken by the Government of India over the course of the last decade have put the economy firmly on a growth path, thanks to which India is soon set to become the third largest economy in the world, following the US and China. In its April 2024 World Economic Outlook, the IMF has raised India's growth forecast for 2024-25 to 6.8 per cent from 6.5 per cent on the back of strong domestic demand and a rising working-age population, making India the fastest-growing G20 economy. It is in line with our expectations for economic growth, as mentioned in Chapter 1. India has graduated from being a low-income country to a low-middle-income country. As it journeys further towards middle and upper-middle-income status, aspirations of the people keep rising. Satisfaction with past progress fades away from memory quickly, and newer expectations take their place. The measurement of achievements in the present against rising aspirations leaves society appear restless and discontented. But, this is creative and not destructive. The latent energy of such aspirations needs to be harnessed even as they have to be met. This has to be carried out in a country of India's size and within a democratic framework. There are no historical precedents and templates to follow for the complexity it entails. What has brought the economy to its present state from where it was three decades ago may not take us to the next destination. Awareness of the unique nature of India's circumstances and its goals is necessary to prepare ourselves to participate in and contribute to its socio-economic progress. Our knowledge and attitudes have to continually evolve to keep up with the requirements that the project, 'Viksit Bharat @2047' entails. Open minds are a good place to start.

5.34. Given the above, the present chapter presents a six-pronged growth strategy premised on the understanding that the structural reforms of the last decade, focused on the supply side of

the economy, have to give way to next-gen reforms that are bottom-up in nature to yield strong, sustainable, balanced and inclusive growth. Primary amongst these strategies is to ensure that capital formation in the private sector grows organically and steadily, delivering endogenous growth in jobs and a fair share of income for workers. Second, financing green transition for India is an area where public-private partnerships will be critical. There need to be innovative financing instruments that can help mobilise private capital towards India's transition efforts. Third, as far as MSMEs are concerned while bridging the credit gap remains a crucial element, the focus also needs to be on deregulation, enhancing physical and digital connectivity, and putting in place an export strategy that enables MSMEs to broaden their market exposure and scale up. Fourth, the potential of agriculture to be an engine of growth, development, and equity has to be exploited through intelligent farmer-friendly policies that are environmentally and climatically sustainable. Fifth, India's education policies and skill policies should adopt a laser-like focus on learning and skilling outcomes and need to be aligned with each other, as well. We can draw lessons from global experiences on how this could be achieved, such as the EU Cohesion Policy³³. Lastly, enhancing state capacity and capability is critical to ensure that the growth strategy suggested in this chapter achieves fruition. Sustaining and accelerating India's progress in the face of evolving challenges requires dedicated investment in state machinery to reinvent and reinvigorate itself.

5.35. In Chapter 2 of 'The Indian Economy: A Review', published in January 2024, we wrote that there was considerable scope for the economy to grow at or above 7 per cent on a sustained basis if we could build on the structural reforms undertaken since 2014. The strengthening of the banking system, the creation of an Insolvency and bankruptcy framework, the institution of a nationwide Goods and Services Tax, and the expansion of the country's physical and digital infrastructure are but a few of them. The strategies presented in this Chapter seek to build on these policy initiatives.

5.36. The new government at the helm of affairs signifies continuity as well as change as India progresses towards the collective goal of ViksitBharat@2047. As envisioned by Prime Minister Modi, *"We need to walk the roadmap of progress, and it won't be solely determined by the government; the nation will shape it. Every citizen will have to give his input and actively participate in it. 'Sabka Prayas', meaning everyone's effort, is a mantra that turns the biggest resolutions into reality. Whether it's the Swachh Bharat Abhiyan, Digital India campaign, dealing with COVID-19, or the idea of Vocal for Local, we have all witnessed the power of 'Sabka Prayas'. It is through 'Sabka Prayas' that a 'Viksit Bharat' will materialise³⁴."*

³³ Education, training and lifelong learning remain a priority in the 2021-2027 period in EU cohesion policy. Overall, EUR 33.6 billion of EU planned allocations have been allocated to measures directly targeting education, training and skills development. The combination and coordination of measures supported by these funds will allow Member States and regions to strengthen their efforts towards more inclusive and quality education and training systems in an integrated manner, as well as support reforms in these areas, <https://tinyurl.com/wsuwjsdj>

³⁴ PIB press release of Ministry of Commerce & Industry dated 11th Dec, 2023 (<https://tinyurl.com/yc2r4ate>)

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CLIMATE CHANGE AND ENERGY TRANSITION: DEALING WITH TRADE-OFFS

06

CHAPTER

Despite being one of the fastest-growing economies in the World, India's annual per capita carbon emission is only about one-third of the global average. India envisions a 'Viksit Bharat' by 2047, which translates to 'Developed India'. This vision and the goal of achieving Net Zero carbon emissions by 2070 guide the country's interventions for high and robust economic growth, which is inclusive and environmentally sustainable. Access to stable energy at a reasonable cost at a pace required to power ambitious targets while on a low-carbon pathway is a sine quo non for development. This task is a challenge, considering that cleaner and greener energy sources require viable battery storage technologies and access to critical minerals to allow these sources to be stable energy suppliers. Balancing development needs with a low-carbon pathway is a tightrope, especially when financed predominantly through domestic resources.

INTRODUCTION

6.1. Since the last Economic Survey was written, there has been no dearth of conferences, meetings, and summits dedicated to climate change. It continues to dominate policy and other discourses around the world. It provides a ready-made topic for think tanks, experts, and policy wonks to appear suitably concerned. However, the world is realising what experts and policymakers in advanced nations are resisting - that its current approach to dealing with climate change is flawed for one very simple reason. It continues to ignore trade-offs. But practical men and women have been unable to avoid recognising trade-offs. Countries had to push back their own timelines.

6.2. The United Kingdom postponed its decision to ban the sale of vehicles that run on petrol and diesel for five years from 2030 to 2035. Germany had to dilute its rules for banning boilers running on fossil fuels before they could be passed. The rise of alternative political parties in developed nations is attributed to the public's resistance to climate-related rules that are perceived as unfairly targeting the poor and low-income by raising their cost of living. According to Bloomberg, German businesses cite rising energy costs as the single biggest reason for relocating out of the country¹. That is the crux of the challenge that governments are grappling with.

6.3. Alternative energy sources require fiscal subsidies to be affordable. However, most governments worldwide are fiscally stretched, especially after dealing with the economic and

¹ 'Germany's Days as an Industrial Superpower Are Coming to an End', 10th February 2024, Bloomberg (<https://www.bloomberg.com/news/features/2024-02-10/why-germany-s-days-as-an-industrial-superpower-are-coming-to-an-end>)

health dislocations caused by the pandemic. Many countries also tax fossil fuels heavily. By clamping down on their usage, governments will lose those revenues. Geopolitically, the thrust on renewable energy and electric vehicles has set off a race to secure critical minerals and rare earths. China has positioned itself as an indispensable source of several of these materials. Securing supply in crunch times is a matter of concern. Nuclear energy is the cleanest and safest option. However, some nations are reluctant to consider it given that their public overestimates probabilities of rare events, as humans are wont to. Three-mile island, Chernobyl and Fukushima, loom large in people's minds. Prof. Daniel Kahneman, who passed away earlier this year, would have chuckled.²

6.4. Relatively common metals like copper and nickel are going to become scarcer. In 'The Material World', Ed Conway wrote that the world might need more copper in the next few decades than it has ever used since the metal was known to humans. Not just copper but other metals will also be in short supply. The price of energy transition will be too much for most nations. It will only get worse. More importantly, extracting materials and minerals requires a tremendous amount of energy. Analysts in JP Morgan wrote³, "*... just developing the forecasted wind and solar capacities would require ~10EJ of energy during 2024-30, which is equivalent to ~20% of our projected global energy demand growth over the same period (forecasts based on our Global Energy Outlook) and will emit ~1,450 mn tonnes of CO_{2e} (~207 mn tonnes on average, equivalent to the annual emissions of Pakistan or Argentina in 2022). Additionally, the projected penetration of electric vehicles in the global light-duty vehicle fleet requires another ~10EJ of energy to build and charge these EVs.*"

6.5. The other factor is time. Nowhere in the world has energy transition of this scale happened within the short time envisaged. Vaclav Smil wrote in 2014,⁴ "*... each widespread transition from one dominant fuel to another has taken 50 to 60 years.... Energy transitions on a national or global scale are inherently protracted affairs. The unfolding shift from fossil fuels to renewable energy sources will be no exception. It will require generations of perseverance.*" In fact, he wrote that the more effective solution was to lower overall energy use. Alas, that is one advice that the world is either unable to or unwilling to heed. It is hard to fault developing countries for not wanting to curb their energy consumption. It is morally wrong to tell developing countries to abandon their aspirations for better living standards so that developed countries can maintain their ways of living in cleaner environments and cooler climates.

6.6. However, the Paris Agreement signed in December 2015 did precisely that. It trumped the Sustainable Development Goals agreed upon barely three months earlier. Professor Mike Hulme wrote, ⁵ "*The goal of securing global temperature within a certain numerical range took precedence over a broader set of welfare ambitions, in part because of the success of*

2 His research showed that humans beings consistently overestimate the probability of rare events

3 "The Energy Transition", 18th April 2024, Global Energy Strategy, JP Morgan

4 Vaclav Smil: 'A Global Transition to Renewable Energy Will Take Many Decades', Scientific American, January 2014 (<https://www.scientificamerican.com/article/a-global-transition-to-renewable-energy-will-take-many-decades/>)

5 Hulme, Mike. Climate Change isn't Everything: Liberating Climate Politics from Alarmism (p. 51). Polity Press. Kindle Edition.

climate scientists and Government negotiators in characterising the goal of climate policies in terms of a single, and seemingly simple, index. Yet, ...global temperature is a seriously flawed index for capturing the full range of complex relationships between climate and human welfare and ecological integrity.”

6.7. Not only have development goals been downgraded in the process of elevation of containing global emissions to the pinnacle of all economic policies, but developing nations are also being threatened with a carbon tax at the border, in full negation of the spirit of common but differentiated responsibilities and respective national capabilities that was supposed to have undergirded the Paris Agreement.

6.8. It would be a comedy if it were not real and tragic. Even as developed nations prepare to impose a carbon tax at the border on imports coming into their countries laden with carbon, they are ramping up energy demand like never before, thanks to their obsession with letting Artificial Intelligence (AI) guide, take over and dominate natural intelligence. One of the leading global technology companies promised to achieve Net Zero by 2030 at the turn of the decade. But, the race to dominate the emerging technology of Artificial Intelligence has caused its emissions to be higher by 30 per cent by 2023. In a research report⁶ published in April, analysts in Goldman Sachs wrote that the demand for power in the United States would experience a growth not seen in a generation, thanks to AI and that "*transmission, one of the major bottlenecks for clean energy transition, and the addition of data centres and AI could exacerbate this*". This and other issues pertaining to managing energy demand as a sensible way of dealing with climate change are examined intensely and analysed forensically in Chapter 13 in a special essay.

6.9. However, these developments should convince any reasonable reader that the developed world has not only tied itself into knots but is also contributing – wittingly or otherwise – to deepening and entrenching poverty and inequality in developing and consigning them to perpetual underdeveloped status by coercing them into prioritising emissions over their economies. Developed countries, having relied on a fossil fuel-based growth strategy for the past two centuries to reach where they are today, seek ambitious cuts in emissions from developing countries, pushing them to adopt policy measures, instruments and production and energy systems that are distinctly different from the carbon-emitting traditional strategies that fuelled the growth of the former. The fact that these novel pathways are untested or trusted is apparent from the recent deliberations of the G7 countries on ending the use of unabated coal power plants only in the first half of 2030,⁷ even when their carbon emissions peaked several decades ago. Japan and Germany did not agree to this. In contrast, Germany has written into its legislation a final target to shut coal plants by 2038, while Japan has yet to set a date. This is a recipe for intra and international conflicts.⁸

6 'Generational growth: AI, data centres and the coming US power demand surge', 28th April 2024, Goldman Sachs Equity Research

7 G7, Climate, Energy and Environment Ministers' Meeting Communiqué, (Torino, April 29-30, 2024), <https://www.meti.go.jp/press/2024/05/20240501001/20240501001-a.pdf>.

8 Francesca Landini, G7 to sign exit from coal by 2035, but may offer leeway, sources say, Reuters, (April 30, 2024), <https://www.reuters.com/business/energy/g7-ministers-agree-coal-plants-shutdown-by-2030-2035-uk-says-2024-04-29/>.

6.10. The impact of climate change will affect developing countries disproportionately because these countries are already vulnerable and less resilient and must prioritise their economic development needs. Though not part of the problem, developing countries are part of the solution. Developing countries have already accepted the need for ambitious greenhouse gas emissions reduction, as evidenced by their Nationally Determined Contributions (NDCs), on the condition that the developed countries provide resources at a reasonable cost. Incorporating the impact of climate change into the development model, also called the low-carbon development pathways, requires access to technology and financial resources in the order of trillions of dollars. Even by conservative standards, the estimate of resource requirement (considering that not all the needs have been costed) ranges between USD 5.8 - 11.5 trillion till 2030⁹. With financial resources and technology not reaching developing countries at the desired pace, quantity, or terms, economic growth, and prosperity, albeit sustainably, will equip developing countries with the strength to address climate change.

6.11. Globally, recognising trade-offs is critical to bringing climate goals into the realm of feasibility and acceptability. To recognise trade-offs, we need to be able to ask the right and, more importantly, honest questions.

6.12. One such question is *“Is imagining a world without climate change all that useful? It almost goes without saying that if we could keep the benefits of fossil-fuelled industrialisation and jettison the negative side effects of climate change, we would do so. But what makes decision-making so thorny is that for most climate-sensitive societal outcomes...the net effect of fossil-fuelled industrialisation and technological change has been good...Thus, “without climate change” is not always the most relevant hypothetical counterfactual, and often “without fossil-fuelled industrialisation and technological progress” is more relevant. This framing gives a more honest and holistic picture of the state of the climate change problem, and it does not misleadingly paint the current systems as being less attractive than they actually are. When we assess the best course of action going forward, we must compare alternative systems and weigh the benefits of avoided climate change against the costs of transitioning to alternative energy and agricultural systems over time. This is the only way to be accurate and forthright on the trade-offs we face.”*¹⁰

6.13. Fittingly, the last word of this introductory section should be left to Mike Hulme, who has been studying the phenomenon for more than four decades:

“Climate change isn't everything. It is quite easy to imagine future worlds in which global temperature exceeds 2°C warming which are 'better' for human well-being, political stability and ecological integrity, for example, than other worlds in which – by all means and at all costs – global temperature was stabilised at 1.5°C.”

6.14. As for India, despite the challenges mentioned above, managing the impact of climate change while ensuring that developmental priorities continue to get the focus has been the hallmark of its growth strategy. The chapter reviews India's initiatives and performance in

⁹ The First report of the Standing Committee on Finance on the determination of the needs of developing country Parties related to implementing the Convention and the Paris Agreement, <https://tinyurl.com/5n92sppt>.

¹⁰ Patrick Brown, A Rhetorical Ambiguity That Propagates Climate Misinformation, Breakthrough Institute, (July 3, 2024). <https://thebreakthroughjournal.substack.com/p/a-rhetorical-ambiguity-that-propagates>.

addressing climate change, discusses energy transition issues, and deliberates upon the status of the multilateral negotiations. The chapter ends by exploring the options and the way forward

PRESENT STATUS OF INDIA'S CLIMATE ACTION

6.15. India has adopted the mission-mode approach to address climate change. The National Action Plan on Climate Change (NAPCC)¹¹ outlines the strategy to enhance the sustainability of the country's development path. Based on the principles of achieving high economic growth while also improving the ecological sustainability of India's developmental path, NAPCC includes nine national missions covering solar, water, energy efficiency, forests, sustainable habitat, sustainable agriculture, sustaining the Himalayan Ecosystem, strategic knowledge for climate change, and the recently added mission on human health. A broad spectrum of climate action - adaptation and mitigation, including demand side management - is being taken through the programme. States and Union Territories (UTs) have been encouraged to prepare their State Action Plan on Climate Change (SAPCC) consistent with strategies in the NAPCC. So far, 34 SAPCCs are operational, laying out sector-specific and cross-sectoral, time-bound priority actions for the state.

6.16. India has made significant progress on climate action. The addition to the installed solar power capacity was 15.03 GW in 2023-24, reaching a cumulative of 82.64 GW on 30 April 2024.¹² Under the National Mission on Enhanced Energy Efficiency, the eighth cycle of the Perform Achieve and Trade (PAT) scheme¹³ was notified in June 2023 for the period 2023-24 to 2025-26 and covers sectors like Aluminium, Cement, Chlor-Alkali, Iron & Steel, Pulp & Paper, and Textile with a total energy saving target of 0.3370 MTOE (million tonnes of oil equivalent). The PAT scheme in its various cycles has resulted in a significant amount of energy savings and a reduction in greenhouse gas (GHG) emissions (Box 2).

6.17. As a result of the coordinated action, most targets of the first NDC were achieved well in advance. For instance, the country achieved 40 per cent cumulative electrical power installed capacity from non-fossil fuel-based energy sources in 2021 and reduced the emission intensity of India's GDP from 2005 levels by 33 per cent in 2019— nine and eleven years before the target year of 2030, respectively. The NDC was further updated in August 2022.¹⁴ The target to reduce the emissions intensity of India's GDP was enhanced to 45 per cent (from the earlier 33-35 per cent) by 2030 from the 2005 level, and the target on cumulative electric power installed capacity from non-fossil fuel-based energy resources increased to 50 per cent (earlier 40 per cent) by 2030. As of 31 May 2024, the share of non-fossil sources in the installed electricity

11 National Action Plan on Climate Change (NAPCC), Frequently Asked Question, December 01, 2021, PIB, <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2021/dec/doc202112101.pdf>.

12 Year-wise Achievements, M/o New and Renewable Energy, <https://mnre.gov.in/year-wise-achievement/>.

13 Perform, Achieve and Trade (PAT) is a regulatory instrument to reduce Specific Energy Consumption in energy-intensive industries, with an associated market-based mechanism to enhance the cost-effectiveness through certification of excess energy saving which can be traded. Currently, the eighth cycle of this scheme is under operation, <https://beeindia.gov.in/en/perform-achieve-and-trade-pat-o>.

14 India's Updated First Nationally Determined Contribution Under Paris Agreement (2021-2030), (August 2022), Submission to UNFCCC, <https://unfccc.int/sites/default/files/NDC/2022-08/India%20Updated%20First%20Nationally%20Determined%20Contrib.pdf>.

generation capacity has reached 45.4 per cent.¹⁵ India is on track to make an additional carbon sink of 2.5 to 3.0 billion tonnes through tree and forest cover by 2030, with a carbon sink of 1.97 billion tonnes of CO₂ equivalent having already been created from 2005 to 2019.

6.18. Parties to the United Nations Framework Convention on Climate Change (UNFCCC) must periodically submit National Communication (NC) with information on their greenhouse gas emissions, their vulnerability to climate change, and the measures they are taking to mitigate emissions and adapt to the impacts of climate change. India submitted its Third National Communication (TNC),¹⁶ including India's first Adaptation Communication (AC),¹⁷ to the UNFCCC in December 2023. India's TNC mentions that the energy sector contributed the most to the overall anthropogenic emissions at 75.81 per cent, followed by the agriculture sector at 13.44 per cent, Industrial Process & Product Use (IPPU) at 8.41 per cent, and waste at 2.34 per cent. It also mentions that the Land Use, Land-Use Change & Forestry (LULUCF) sector remained a net sink in 2019, accounting for removing 4,85,472 GgCO₂e¹⁸ emissions. Considering total emissions and removals, India's net national emissions in 2019 were 26,46,556 GgCO₂e.

6.19. The plethora of cross-sectoral measures taken in the economy and the several schemes to modify consumer and producer behaviour and promote energy saving have resulted in India's total national emissions (including LULUCF) increasing by 4.56 per cent since 2016, which compares favourably with the growth experienced by the country. Interestingly, India's GDP between 2005 and 2019 has grown with a Compound Annual Growth Rate (CAGR) of about seven per cent, whereas the emissions grew at a CAGR of about four per cent. i.e., the rate of emissions growth is lower than the rate of growth of our GDP. This shows that India has successfully decoupled its economic growth from greenhouse gas emissions, reducing the emission intensity of its GDP. A recent report by the International Finance Corporation recognises India's efforts to achieve committed climate actions, highlighting that it is the only G20 nation in line with 2-degree centigrade warming.¹⁹ Notably, these outcomes have been achieved primarily through domestic resources,²⁰ which have predominantly formed the basis of India's climate action. Given the financing needs, estimated at USD 2.5 trillion (at 2014-15 prices) for meeting the NDC targets till 2030, access to finance and technology at a reasonable cost, including from the developed countries, as mandated by the UNFCCC and its Paris Agreement, is essential to ease the constraint on the required resources.

ADAPTATION IS CRITICAL FOR INDIA

6.20. According to UNDP,²¹ climate change adaptation refers to actions that help reduce vulnerability to climate change's current or expected impacts, like weather extremes and

15 Power Sector at a Glance "ALL INDIA", Ministry of Power, https://powermin.gov.in/sites/default/files/uploads/power_sector_at_glance_May_2024.pdf.

16 IAC is a part of the NC document. National Communication, NC 3, India, (09 Dec 2023), <https://unfccc.int/documents/636235>.

17 Ibid. Submission made under Article 7 of the Paris Agreement.

18 Gigagram of Carbon Dioxide Equivalent.

19 International Finance Corporation. 2023. Blended Finance for Climate Investments in India. The World Bank Group, Washington, DC.(2023), <https://www.ifc.org/content/dam/ifc/doc/2023/Report-Blended-Finance-for-Climate-Investments-in-India.pdf>.

20 National Communication, NC 3, India, (Dec 09, 2023), <https://unfccc.int/documents/636235>.

21 What is climate change adaptation and why is it crucial?, UNDP, (January 30, 2024) <https://climatepromise.undp.org/news-and-stories/what-climate-change-adaptation-and-why-it-crucial>

hazards, slow onset events such as sea-level rise, biodiversity loss, or food and water insecurity. Lower-income countries are particularly vulnerable to the economic impacts of climate change. According to a meta-analysis of several empirical growth studies by Richard Tol (2024),²² the welfare-equivalent income loss due to a 2.5 °C warming relative to pre-industrial times is significantly higher for lower-income countries. Wealth accords a buffer that can mitigate the adverse effects of climate change through resilient infrastructure, adequate healthcare coverage, and access to adaptive technologies, allowing high-income countries to withstand better and adapt to the challenges posed by a warming climate. In contrast, lower-income countries that need to achieve their development priorities face high opportunity costs. Lack of resources makes them more susceptible to increased vulnerability and potential economic disruption. Economic growth enhances the ability of a country to take adaptation action and builds resilience. Therefore, from a developing country's perspective, continued economic growth is the best insurance against climate change.

6.21. India is one of the most climate-vulnerable countries;²³ there is a greater need for adaptive strategies in agriculture and conservation efforts to mitigate the detrimental effects of climate change on natural habitats, vegetation, and vital bio-resources. The Government of India has taken several initiatives to address this. Much of the emphasis in the NAPCC has been on adaptation, with seven of the nine missions addressing it. Further, the promotion of micro irrigation under the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), the introduction of the National Innovations on Climate Resilient Agriculture (NICRA) to enhance the resilience of Indian agriculture to climate change and climate vulnerability through strategic research and technology demonstration, flood forecasting and early warning system, etc. are some significant initiatives in this direction. India's adaptation-relevant action also includes steps taken to improve resilience in the economy through developmental programs such as Swachh Bharat Mission, Mahatma Gandhi National Rural Employment Guarantee Act, Pradhan Mantri Awas Yojana, Saubhagya Scheme, etc., to name a few.

6.22. The Initial Adaptation Communication of India estimates that the total adaptation-relevant expenditure was 5.60 per cent of the GDP in 2021-2022, growing from a share of 3.7 per cent in 2015-16, indicating integration of climate resilience and adaptation into development plans. This reflects the importance that the Government is placing on adaptation action and, at the same time, is reflective of the significant pressure on domestic resources. An increase in adaptation finance flows to India would ease the resource constraint and enable the country to meet its long-term sustainable development and economic growth objectives.

6.23. Coastal regions in India are more vulnerable to climate change. Wetland conservation can be an important adaptation measure in such regions. They provide a buffer and other coping strategies to protect against storm surges and flooding. Urban wetlands can help absorb excess rainfall, protecting cities. Moreover, mangroves are a natural coastal barrier that traps sediment and prevents coastal erosion, which strengthens the shoreline. In addition, many wetlands sustain local communities by supporting fisheries, agriculture, livestock, and the

22 Tol, R. S. (2024). A meta-analysis of the total economic impact of climate change. *Energy Policy*, 185, 113922, <https://www.sciencedirect.com/science/article/pii/S0301421523005074>.

23 The 10 most affected countries in 2019, Table 1, Page 8, Global Climate Risk Index 2021, <https://www.germanwatch.org/en/19777>.

production of fuel. They are a part of the solution to food security issues that may be affected by climate change. India has, therefore, adopted wetland and mangrove conservation as a priority. Since 2014, 56 new wetlands across the country have been designated as Ramsar sites (wetlands of international importance), taking the total number to 82 and covering an area of about 1.33 million ha. The Government of India announced the 'Amrit Dharohar' initiative as part of the Budget announcement 2023 to promote nature tourism in the conserved Ramsar sites, with the view to generating better appreciation for the value of conserving and enabling enhancement of job opportunities. The Mission Sahbhagita is another milestone step towards participatory conservation and wise use of wetlands to enable a societal ownership approach with communities leading at the forefront. The Mission envisages the preparation of wetland health cards, ground-truthing of wetlands against the satellite-based data, and promoting the concept of 'Wetland Mitras' by engaging women, youth, local communities, and the private sector in this work.

Box VI.1: Case Study on Micro Irrigation- Role of Community-led Water Governance²⁴

Navanagar is a small agricultural village in Himmatnagar taluka of Sabarkantha District, Gujarat. Over the years, due to farming practices, the village's water table decreased to 500-600 feet below the ground level. Total Dissolved Salt (TDS), ranging from 900 to 1100 mg/litre, made the water unsuitable for agriculture. Due to these reasons, farming became a loss-making profession for the farmers. Farmers could only produce one conventional crop like cotton & castor. The Water Resource Department, Gujarat, and Gujarat Green Revolution Company (GGRC) mobilised local farmers to rejuvenate the village pond by drawing water from the nearby sub-minor canal of the Guhai Dam.

The village farmers' co-operative society under the 'Som Sarovar', deepened the village pond with the help of the Gram Panchayat to store and conserve water. The farmers built a sump (40 ft diameter x 40 ft depth), drew water from the village pond, took individual electricity connections, and installed water lifting facilities (pump & motor) from the sump. The farmers bore the total cost of electrical connections and pumping/lifting of water.

Farmers also created the piped water conveyance from the sump to their respective fields. The farmers' body made it compulsory for all the member farmers to adopt drip irrigation for efficient water use under Per Drop More Crop (PDMC). Since then, agriculture productivity has seen a revival with an increase of 30 per cent along with a reduction in fertilizer and power consumption and crop diversification away from conventional crops like wheat, castor, cotton, etc., to fruits & vegetables like watermelon, musk-melon, fennel, cumin and chilly that are more remunerative. Water governance by the community transformed the village from water deficient to water sufficient, ensuring equity in water distribution.

²⁴ Based on inputs from the Department of Agriculture & Farmers' Welfare.

LOW CARBON DEVELOPMENT²⁵ AND ENERGY COMPOSITION

Energy Composition and Efficiency

6.24. India's energy needs are expected to grow 2 to 2.5 times by 2047 to meet a growing economy's developmental priorities and aspirations.²⁶ Considering that resources are limited, the pace of energy transition would need to factor in alternative demands on the resources for improving resilience to climate change and for sustained social and economic development. Achieving Net Zero by 2070 requires an orderly transition to a diversified mix of energy sources with a significant share of non-fossils and enhancement in energy production and usage efficiency. Phasing renewable energy into the country's energy mix is paramount in India's drive towards cleaner energy sources.

6.25. India's primary energy mix in 2022-23 was fossil-fuel dominant, with almost 84 per cent met from coal, oil, and natural gas combined (Figure 1). However, the composition in the electricity sector has significantly changed due to the phasing in of renewables, with the share of non-fossil power capacity being 45.4 per cent as of May 2024 from around 32 per cent in April 2014.²⁷ Recent initiatives for enhancing the production of renewables are noteworthy. First, PM-Surya Ghar Yojana, launched in February 2024 with a total outlay of ₹75,021 Crore, is expected to add 30 GW of solar capacity and reduce 720 million tonnes of CO₂ equivalent, creating around 17 lakh direct jobs across the solar value chain.²⁸ Second, given India's 7,600 km long coastline, the Government has notified the national offshore wind energy policy and offshore wind energy lease rules, 2023.²⁹ Several offshore zones have been identified for harnessing this potential, and viability gap funding for an initial capacity of one gigawatt has been announced recently.³⁰ Third, underscoring the importance of green hydrogen in reducing carbon emissions in the hard-to-abate sectors, India's Green Hydrogen Mission targets five MMT of green hydrogen by 2030.³¹ The scheme offers financial incentives to boost electrolyser manufacturing and production. The tender for selecting green hydrogen producers & electrolyser manufacturers under the Strategic Interventions for Green Hydrogen Transition (SIGHT) scheme has been awarded for a total capacity of 4,12,000 tons.³²

6.26. India's ambitious green hydrogen production target is subject to various constraints, including on the supply side - the cost of production and delivery, and, on the demand side -

²⁵ Low-carbon development is defined as a development strategy that aims at reducing emissions while ensuring economic development and improved welfare. It places economic development as a priority while taking mitigation actions that enable a reduction in emissions.

²⁶ Based on inputs from NITI Aayog

²⁷ Data for 2014 is from MoSPI's Energy Statistics 2024, https://www.mospi.gov.in/sites/default/files/publication_reports/EnergyStatistics_India_publication_2024N.pdf

²⁸ Cabinet approves PM-Surya Ghar: Muft Bijli Yojana for installing rooftop solar in One Crore households, PIB, (February 29, 2024), <https://pib.gov.in/PressReleasePage.aspx?PRID=2010130>.

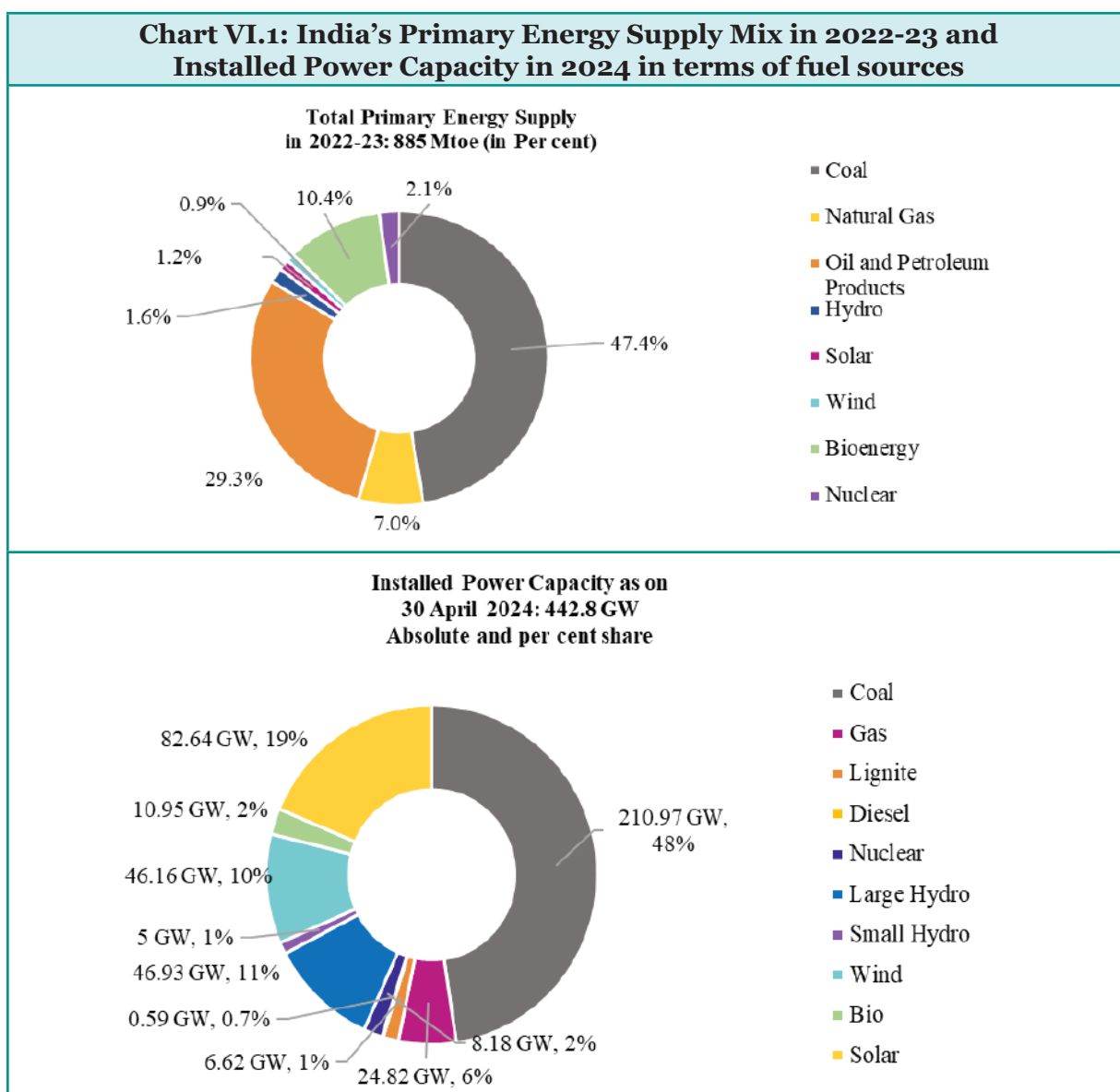
²⁹ Offshore Wind Energy Lease Rules, 2023, (December 19, 2023), <https://tinyurl.com/5ssvpsk4>

³⁰ Cabinet approves Viability Gap Funding (VGF) scheme for implementation of Offshore Wind Energy Projects, PIB, (June 19, 2024), <https://pib.gov.in/PressReleasePage.aspx?PRID=2026699>.

³¹ National Hydrogen Mission - Decarbonising India, Achieving Net-Zero Vision, Ministry of New & Renewable Energy, PIB, updated on January 10, 2023, <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2023/jan/doc2023110150801.pdf>

³² Tenders awarded for 4.12 lakh tonnes per annum of green hydrogen production and 1,500 MW per annum of electrolyzer manufacturing under National Green Hydrogen Mission: Union Power and New & Renewable Energy Minister, PIB, (Feb 07, 2024), <https://tinyurl.com/mrx6wzy3>.

readiness to consume green hydrogen in traditional industrial processes. The electrolyzers and renewable energy used as inputs are the two major components of green hydrogen production cost. The cost of capital, water supply and treatment, storage and distribution, conversion of hydrogen to suitable derivatives, and an enabling infrastructure would also contribute to the final delivered cost of green hydrogen for any particular application. As green hydrogen is produced using renewable energy, the sector inherits all the limitations of the renewable sector, including the issue of intermittency and the huge requirement of land for solar and wind energy generation.

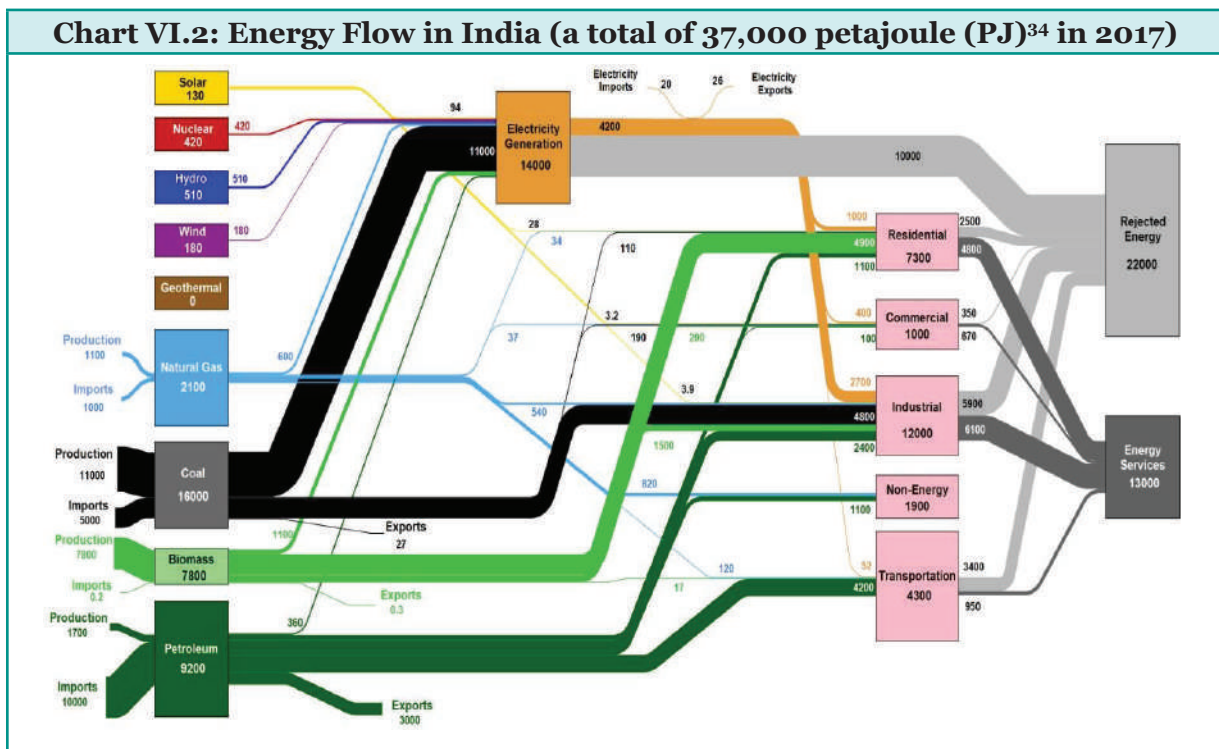


Source: Data obtained from NITI Aayog and Central Electricity Authority (<https://cea.nic.in/installed-capacity-report/?lang>)

6.27. At present, three typical features characterise India's energy use - high use of biomass as a share of the total primary energy supply, predominance of imports of fossil fuel (mainly petroleum) and use of domestic coal for electricity generation. The high use of biomass is set to change significantly with the advancement of solar rooftop installations, the proliferation of

solar appliances, and the ramping up of LPG-based cooking. Petroleum (85 per cent of which is imported) has a diversified presence across transport, industrial sector, residential, and commercial, which poses a significant challenge given the volatility in oil prices and limited access to natural gas.

6.28. Coal accounts for nearly 70 per cent of the total electric generation. It is also a critical input in various industries, such as steel, sponge iron, cement, and paper. Addressing the transition when coal is a predominant energy source, even though the Government has been stimulating the phasing-in of renewables, requires a sequenced movement towards cleaner coal and more efficient technologies. The Government has launched several clean coal initiatives, including the Coal Gasification Mission. It aims to gasify 100 million tonnes of coal by 2030 through surface coal/lignite gasification projects. Adopting gasification technology in India can revolutionise the coal sector, reducing reliance on imports of Natural Gas, Methanol, Ammonia, and other essential products while reducing emissions. Initiatives such as extracting Coal Bed Methane (CBM) gases, exploring coal to hydrogen, Carbon Capture and Storage (CCS), and coal beneficiation through washeries, etc. can mitigate emissions and enhance environmental sustainability. Encouragement to adopt super-critical and ultra-super-critical technologies³³ for coal power plants has also led to lower emissions and higher efficiency.



Source: Lawrence Livermore National Laboratory. <https://flowcharts.llnl.gov/commodities/energy>

³³ Such plants operate at temperatures and pressures above the critical point of water (above the temperature and pressure at which the liquid and gas phases of water coexist in equilibrium). As on 10th August 2023, 94 coal-based thermal units of a total capacity of 65150 MW are operating with super-critical/Ultra super-critical technologies. [Phasing out of coal-based thermal power plants and adoption of super-critical technologies in thermal power plants, PIB, (Aug 10, 2023) <https://pib.gov.in/PressReleasePage.aspx?PRID=1947384>.].

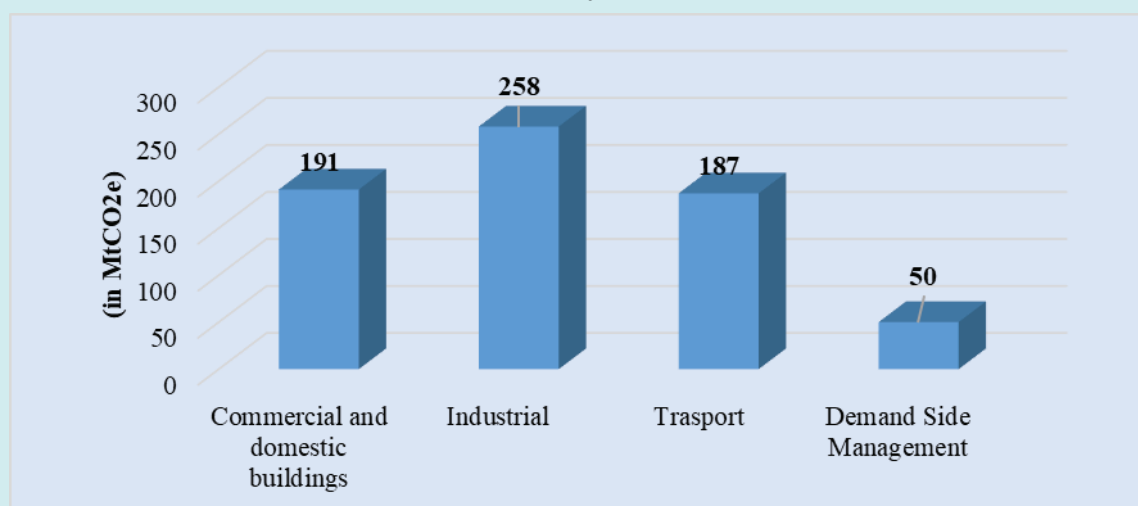
³⁴ 1 petajoule = 10¹⁵ and 1 calorie = 4.18 joules.

6.29. Policymakers recognise the importance of energy efficiency measures in accelerating clean energy transitions while supporting energy security. It may be noted that the outcome of the first Global Stocktake (GST) seeks to double the global average annual rate of energy efficiency improvements by 2030, pursued in a nationally determined manner and as per differing national circumstances.³⁵ The measures taken by the country to increase energy efficiency are presented in Box 2.

Box VI.2 Steps taken to improve Energy Efficiency³⁶

India has an ambitious target of Emissions Intensity (EI) reduction of 45 per cent by 2030 from the base of 2005. To achieve this, absolute emissions must be restricted to around 4584 million tonnes of CO₂ equivalent (MtCO₂e). This means that the overall emissions in the economy would have to be reduced by 3753 MtCO₂e (over the baseline scenario) to meet the NDC target. The sectoral breakup under the energy efficiency domain to achieve 2030 targets is given in Figure 3.

Chart VI.3: Target emissions reductions to achieve the NDC commitment by 2030 (in MtCO₂e)



Source: Based on data provided by Ministry of Power, GOI

Energy efficiency improvement in buildings and appliances is a priority for India as over 50 per cent of the 2030 building stock is yet to come up – a situation that is fundamentally different from developed countries.³⁷ A reduction in emission intensity in the building sector will play a key role in achieving the target. Presently, around 33 per cent of the total electricity consumption is in consumers' commercial and residential categories, estimated to grow to approximately 40 per cent of total electricity consumption by 2031-32.

³⁵ Para 28, Decision 1 CMA.5 (https://unfccc.int/sites/default/files/resource/cma2023_16a01E.pdf?download)

³⁶ Based on inputs from the Ministry of Power.

³⁷ Energy Conservation Building Code (ECBC), Bureau of Energy Efficiency, Government of India, Ministry of Power, <https://beeindia.gov.in/en/energy-conservation-building-code-ecbc>.

The Energy Conservation Building Code (ECBC) sets minimum energy performance standards for commercial buildings. A voluntary star rating program has also been launched for existing commercial buildings. Shunya labelling program identifies and commemorates Net Zero Energy Building (NZEB) and Net Positive Energy Buildings (NPEB). For appliances, the Standards and Labelling (S&L) program was launched to provide consumers with an informed choice about the energy and cost-saving potential of the labelled appliances/equipment being sold commercially. As per the 2022-23 Impact Assessment report of BEE, the S&L program helped save 81 billion units of electricity. The Government has also implemented a Star-rated program to offer high-efficiency ACs for consumers, and BEE has designed an incentive-based market transformation program offering incentives for consumers to switch from ACs older than eight years to 5-star rated models.

The Lifestyle for Environment (LiFE) initiative was launched by the Prime Minister of India at COP26 in Glasgow in November 2021. It aims to encourage the adoption of sustainable lifestyles to address the challenges of environmental degradation and climate change. India has integrated several policies in its energy transition strategy that are aligned with LiFE.

Adopting energy-efficient practices is at the heart of LiFE.³⁸ Household consumers can, by adopting energy-efficient appliances and buildings, sustainable mobility and virtuous energy management foster a widespread culture of energy efficiency. According to IEA analysis, adopting worldwide LiFE actions – including behavioural changes and sustainable consumption choices – would save consumers about USD 440 billion and amount to one-fifth of the emissions reduction needed by 2030. Behavioural and lifestyle changes are also among the pillars put forth by India during the G20 presidency's strategic plan for advancing energy efficiency across demand sectors by 2030. An energy-efficient lifestyle not only benefits individuals but also helps governments to reduce or delay new investments in energy infrastructure and allows for the use of that money in other investments needed in the country.

In India, mission LiFE is being unfolded by BEE in three distinct phases focusing on individual behavioural change:

- encouraging people to adopt simple yet effective energy-saving practices in their daily lives,
- influencing industries and markets to cater to sustainable consumption patterns and
- to trigger a shift in large-scale industrial and Government policies, promoting sustainable production and consumption.

BEE's efficiency policies also extend to promoting behavioural change and consumer awareness. Mindful consumption is promoted through programmes such as the recent campaign on setting air conditioners at 24 °C. The AC @ 24 campaign uses an approach based on optimizing consumption, switching to efficient technologies, shifting to energy-saving behaviour, and upgrading technologies.

³⁸ Mission LiFE aims to build a mass movement to adopt sustainable lifestyles based on mindful utilisation, minimising waste, and making green choices, for themselves, their families, and their communities.

For the industrial sector, the Perform, Achieve, and Trade (PAT) scheme is another measure of demand management that aims to reduce emissions in energy-intensive industries. For a particular cycle, the mechanism involves assessing Specific Energy Consumption (SEC) in the baseline year and projected SEC in the target year. It covers different forms of net energy going into the plant's boundary and products leaving it. Eight cycles of the scheme have been launched so far. As the next level of action, the Ministry of Power has come out with the Carbon Credit Trading Scheme (CCTS).

For the transport sector, fuel consumption standards and norms have been set for cars, heavy-duty vehicles (HDVs), and others. Considering the burgeoning numbers of Electric Vehicles (EVs), 'Charging Infrastructure for Electric Vehicles – Guidelines and Standards' have been notified to promote the ecosystem of charging infrastructure.

Demand-side management (DSM) has traditionally been recognised as a significant intervention to reduce energy demand. It is an ultimate irony that even as developed nations obsess over prospective emissions from the developing world, the widespread adoption of artificial intelligence is going to result in the demand for power to expand to levels not seen in decades in America.³⁹ The failure and unwillingness to restrain energy demand and the search for so-called alternative energy sources – with their much lower energy density compared to fossil fuels – comes with unprecedented demand for financial and other resources and heightened geopolitical vulnerabilities and stress. The warped priorities of advanced economies are sought to be achieved at the cost of legitimate economic aspirations in the developing world.

In India, DSM interventions have helped utilise and reduce the peak electricity demands and defer high investments in generation, transmission, and distribution networks. Measures that enable efficiency gains can be an effective way to reduce demand.⁴⁰ A few of these measures include energy-efficiency pump sets in agriculture, improving the efficiency of the local bodies' drinking and sewage water pumping systems, improving the efficiency of the distribution transformer network, and star rating of appliances and white goods.

The above interventions have led to significant energy savings. Total annual energy savings are around 51 million tonnes of oil equivalent (MTOE) – amounting to around 6.6 per cent of the total primary energy supply of the country. This translates to a total annual cost savings of approximately ₹1,94,320 Crore and an annual CO₂ emissions reduction of around 306 million tonnes. Program-specific results are as follows: The S&L Scheme has so far reduced emissions by approximately 60 MtCO₂, while the PAT scheme reduced emissions by 110.7 MtCO₂, and the energy-efficient LED bulbs allowed a saving of 125 MtCO₂.

Challenges of Energy Transition

6.30. Renewable energy faces intermittency and discontinuous supply, impacting grid stability in the absence of battery storage. Energy demand is expected to increase substantially as the country develops in line with the goal of 'Viksit Bharat', and a concomitant rise in renewable

³⁹ 'AI, data centres and the coming US power demand surge', Goldman Sachs, 28th April 2024

⁴⁰ Smil, V. (2014). A global transition to renewable energy will take many decades. *Scientific American*, 310(1), 52-57.

capacity may lead to a decline in base load efficiency as the supply composition changes. Large-scale phasing-in of renewables poses several risks⁴¹ associated with intermittency and dispatchability in the energy system. Addressing the issue is critical for the more significant deployment of renewable energy.

6.31. Some estimates suggest that the Levelised Cost of Electricity (LCOE)⁴² of renewables such as solar has fallen below that of fossil fuels in several countries, including India, Brazil, Australia, and Italy.⁴³ From an investor's perspective, the LCOE represents the total cost of building and operating the asset per unit of electricity generated over an assumed lifetime. Investing in the project may be viable if the LCOE is lower than the electricity tariff. However, even as the LCOE for renewables has been falling, it does not reflect the total cost the economy faces. The metric of LCOE ignores the costs associated with intermittency and dispatchability. Renewable power needs to be backed up by a stable power source when the sun is not shining and the wind is not blowing. If the producer is not mandated to make the power dispatchable, then energy procurement at LCOE reflects an implicit subsidy for the producer. One way to resolve this is to have Round-The-Clock (RTC) renewable energy supply contracts, which allow the internalisation of risks related to intermittency and dispatchability.

Box VI.3: Round-the-Clock (RTC) Supply of Renewable Energy (RE)

The objective of the Round-the-Clock (RTC) supply is to match the buyer's energy demand curve through renewable energy power projects with energy storage systems.

Ministry of Power issued 'Guidelines for Tariff Based Competitive Bidding Process for Procurement of Firm and Dispatchable Power from Grid Connected Renewable Energy Power Projects with Energy Storage Systems' in 2023 to provide a framework for Power Purchase Agreements (PPAs) for RTC supply.

A few examples of the tariffs discovered during the recent round of biddings are as follows:

- Solar Energy Corporation of India (SECI) for Interstate Transmission System (ISTS)-connected solar PV power projects were in the range of 2.6 to 2.74 ₹/kWh.⁴⁴ For ISTS-connected wind and solar hybrid, the range was 3.43 to 3.54 ₹/kWh.⁴⁵ For ISTS-connected wind power, it was 3.18 to 3.49 ₹/kWh.⁴⁶ The range was 4.64 to 5.96 ₹/

41 Risk reflects the potential inability of the energy system to deliver on its essential function – a reliable, stable, and sustainable supply of energy at affordable prices and social costs.

42 The levelized cost of electricity (LCOE) is a measure of the average net present cost of electricity generation for a generator over its lifetime.

43 Ram, M., Child, M., Aghahosseini, A., Bogdanov, D., Lohrmann, A., & Breyer, C. (2018). A comparative analysis of electricity generation costs from renewable, fossil fuel, and nuclear sources in G20 countries for the period 2015-2030. *Journal of cleaner production*, 199, 687-704, <https://www.sciencedirect.com/science/article/abs/pii/S0959652618321486>.

44 Selection of 1500 MW ISTS-connected Solar PV Power Projects (SECI-ISTS-XIV), Solar Energy Corporation Of India Limited, (Jan 18, 2024), <https://www.seci.co.in/upload/Bidder/638532654344846316.pdf>.

45 Selection of 1200 MW ISTS-connected Wind-Solar Hybrid Power Projects in India (Tranche-VIII), Solar Energy Corporation Of India Limited, (Feb 20, 2024), <https://www.seci.co.in/upload/Bidder/638545687623852290.pdf>.

46 Selection of 1200 MW ISTS-connected Wind Power Projects (Tranche-XIV), Solar Energy Corporation Of India Limited, (Feb 20, 2023), <https://www.seci.co.in/upload/Bidder/638233876572205236.pdf>.

kWh for ISTS-connected wind-solar hybrid power projects with assured peak power supply.⁴⁷

- Railway Energy Management Company Limited's (REMCL) auction for round-the-clock renewable power led to tariffs in the range of 4.25 to 4.43 ₹/kWh.⁴⁸
- The lowest bid for the auction carried out by Satluj Jal Vidyut Nigam (SJVN) Ltd. was 4.38 ₹/kWh.⁴⁹

The examples indicate that tariffs for RTC projects are higher than those for solar and wind projects without energy storage, reflecting the internalisation of externalities related to intermittent power generation.

RTC-RE is at a nascent stage, and its deployment faces several challenges,⁵⁰ such as the dynamic requirements of the utilities and growing energy demands, especially in the context of schemes like the SAUBHAGYA scheme, agricultural feeder segregation, Time of Day (ToD) mechanism, promotion of solar rooftops; and those incentivising changes in consumer behaviour. Owing to these rapid changes, the RTC product designed for the present demand pattern might need to be revised later .

- The least cost solutions may be obtained by combining solar and wind projects from multiple projects spanning multiple states. This, however, poses a challenge in terms of arranging long-term PPAs with multiple generators, obtaining transmission access at multiple locations, setting up remote control centres for real-time control, etc.
- Higher upfront costs, technology risks, longer payback periods, and limited access to critical and rare earth minerals required for battery storage technology also pose serious challenges. In this context, pump storage-based energy storage solutions can be utilised to reduce system costs, owing to their longer lifetimes compared to battery energy storage systems.

6.32. Many technologies required for global Net Zero are currently commercially unavailable, such as hydrogen-fuelled steel/cement, steel and aluminium production with CCUS⁵¹, etc. There is a need to enhance international cooperation in R&D, especially in the domains of distributed RE⁵², offshore wind, geothermal, tidal energy, biofuels, compressed biogas, green hydrogen, energy storage, electrolyzers, and nuclear power (including Small Modular Reactors SMR⁵³). Grid balancing is equally essential for grid stability and storage. Experience indicates that the

47 Selection of 1200 MW ISTS-connected Wind-Solar Hybrid Power Projects with assured Peak Power Supply in India (Tranche-VI), Solar Energy Corporation Of India Limited, (Nov 02, 2022), <https://www.seci.co.in/upload/bidder/638180388803848112.pdf>.

48 REMCL declares winners of its 750 MW renewable projects, Renewable Watch, (February 2, 2024), <https://renewablewatch.in/2024/02/02/remcl-declares-winners-of-its-750-mw-renewable-projects/>.

49 Sangita Shetty, India's SJVN Auction Results: 1.5 GW Renewable Energy Projects with Storage Draw Strong Interest and Competitive Tariffs, (November 8th, 2023), <https://solarquarter.com/2023/11/08/indias-sjvn-auction-results-1-5-gw-renewable-energy-projects-with-storage-draw-strong-interest-and-competitive-tariffs/>.

50 Techno-Economic Analysis of Renewable Energy Round the Clock (RE-RTC) Supply for Achieving India's 500 GW Non-Fossil Fuel Based Capacity Target by 2030, Central Electricity Authority, (2024), https://cea.nic.in/wp-content/uploads/notification/2024/02/RE_RTC_Final_Report.pdf.

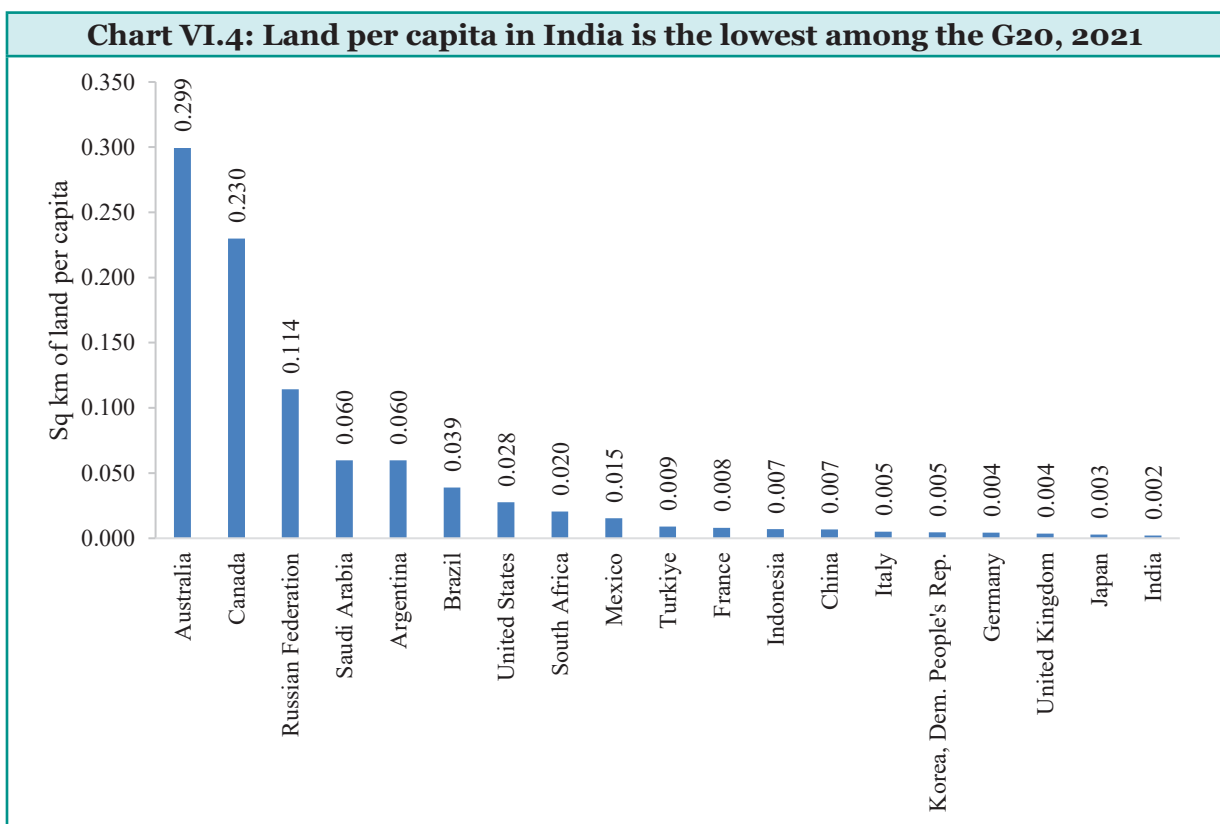
51 Carbon Capture, Utility & storage (CCUS).

52 Distributed RE refers to small-scale generation units located closer to points of use.

53 SMRs are smaller nuclear power plants (300 MWe or less) than current generation baseload plants (1,000 MWe or higher). These smaller, compact designs are factory-fabricated reactors that can be transported by truck or rail to a nuclear power site. SMR output is scalable by putting several smaller units to achieve a larger capacity. Synergistic deployment of such factory-manufactured, made-in-India SMRs along with medium-size 700 MWe Pressurized Heavy Water Reactor (PHWRs) that have been standardised and are being deployed in fleet mode may be a relevant strategy for rapid scale-up of nuclear power capacity in India.

innovation process takes 20 to 70 years from prototype to commercialisation.⁵⁴ However, given the need to contain emissions within the next three decades, this innovation cycle needs to halve.

6.33. Expanding renewable energy and clean fuels will increase demand for land and water. The future scenarios of an increase in energy demand to meet the higher standard of living need to be analysed in the context of rapidly depleting land and water resources. Most renewables are land-intensive and demand the highest land use requirements among the different energy sources. The scaling required for renewable technologies faces several major challenges, including the large requirement for land.⁵⁵ For instance, according to a study,⁵⁶ about 1 MW of solar photovoltaic (PV) may require around 1–1.5 hectares (ha) of land, so 60 GW of solar power would need about 600–900 sq. km of land area at an all-India level. The availability of land is a major challenge for India, which has the lowest land availability per capita amongst the G20 countries (Figure 4). The transition cost would be amplified with the expected increase in the need for land for renewable energy projects.



Source: Calculated using data from the World Bank.

Note: sq. km of land per capita is reciprocal of people per sq. km of land area. Population density is taken from the World Bank (<https://data.worldbank.org/indicator/EN.POP.DNST>).

54 Gross, R., Hanna, R., Gambhir, A., Heptonstall, P., & Speirs, J. (2018). How long does innovation and commercialisation in the energy sectors take? Historical case studies of the timescale from invention to widespread commercialisation in energy supply and end-use technology. *Energy policy*, 123, 682-699, <https://www.sciencedirect.com/science/article/pii/S0301421518305901>.

55 https://psa.gov.in/CMS/web/sites/default/files/publication/ESN%20Report-2024_New-21032024.pdf

56 Ibid.

6.34. Renewable waste recycling is another challenge. Globally, solar photovoltaic (PV) waste is estimated to be as massive as 78 million tonnes⁵⁷ by 2050.⁵⁸ Solar PV panels have a lifetime of 25-30 years, after which the discarded material can either make its way to a landfill or be recycled. The route to landfills is remarkably cheaper than recycling, however, this may lead to leaching of harmful chemicals and heavy metals into the soil. PV waste recycled as scrap poses risks to the environment and human health due to toxic metals, for which we need a comprehensive policy for managing PV waste. India's amended E-Waste (Management) Rules, 2022,⁵⁹ attempts to address concerns regarding disposal practices. However, the challenge imposed by scale cannot be overlooked.

6.35. Critical minerals are required for renewable energy and battery storage technologies. The source of such minerals is geographically concentrated, notably Graphite (China, 79 per cent), Cobalt (DRC, 70 per cent), rare earth (China, 60 per cent), and Lithium (Australia, 55 per cent). The concentration level is even higher for processing, with China dominating across the board. India's initiative to build domestic capacity should be seen in the backdrop of the current supply chain for RE, which is heavily skewed. Box 4 discusses how the geographical concentration of critical and rare earth minerals is increasing and the risks this poses. India has joined the Mineral Security Partnership (MSP) to enable access to critical minerals to smooth the green transition. MSP includes 14 countries, with India being the only developing country. The Government has also released a list of 30 critical minerals for India. At the domestic level, there is a greater focus on exploration. The total number of projects on critical minerals rose from 59 in 2020 to 123 in 2023.

6.36. Further, Khanij Bidesh India Limited (KABIL)⁶⁰ undertakes the identification, acquisition, exploration, development, mining, and processing of strategic minerals overseas by building mutually beneficial G2G partnerships with mineral-rich countries such as Australia, Africa, and Argentina, undertaking trading opportunities and strategic acquisitions or investments in exploration and mining.⁶¹

Box VI.4: Geographical Concentration of Critical and Rare Earth Minerals

IEA's Global Critical Minerals Outlook 2024⁶² highlights a profound surge in the geographical concentration of critical and rare earth minerals (Figure 5). In the case of refined materials, the share of the top three producing nations has increased since 2020 as may be observed in Figure 6. Further, rare earth elements (REE) that play an important role in clean energy transition are among the least geographically diversified of all key energy transition minerals.

⁵⁷ This corresponds to projections by IRENA for a Global cumulative PV capacity of 4,500 GW in 2050.

⁵⁸ IRENA and IEA-PVPS (2016), "End-of-Life Management: Solar Photovoltaic Panels," International Renewable Energy Agency and International Energy Agency Photovoltaic Power Systems. <https://www.irena.org/publications/2016/Jun/End-of-life-management-Solar-Photovoltaic-Panels>.

⁵⁹ E-Waste (Management) Rules, 2022, https://cpcb.nic.in/uploads/Projects/E-Waste/e-waste_rules_2022.pdf.

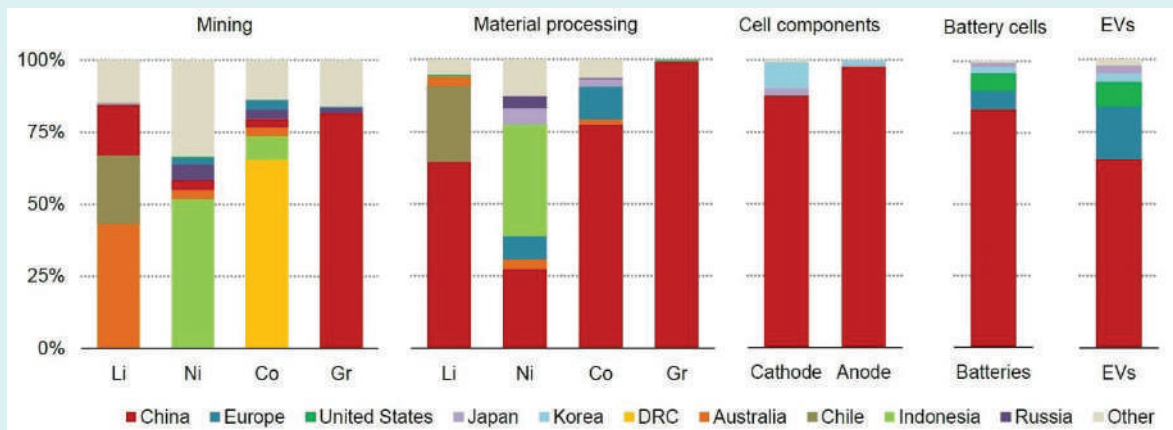
⁶⁰ KABIL is a joint venture company among NALCO, HCL, and MECL, whose target is to identify, acquire, develop, process, and make commercial use of strategic minerals in overseas locations for supply in India. KABIL is focusing on identifying and sourcing battery minerals like Lithium and Cobalt and engagement with a few companies/projects is underway in Australia and Argentina. [<https://mines.gov.in/webportal/content/kabil>]

⁶¹ KABIL Set up to Ensure Supply of Critical Minerals, PIB, (Aug 01, 2019), <https://pib.gov.in/PressReleasePage.aspx?PRID=1581058>

⁶² IEA (2024), Global Critical Minerals Outlook 2024, IEA, Paris, <https://www.iea.org/reports/global-critical-minerals-outlook-2024>.

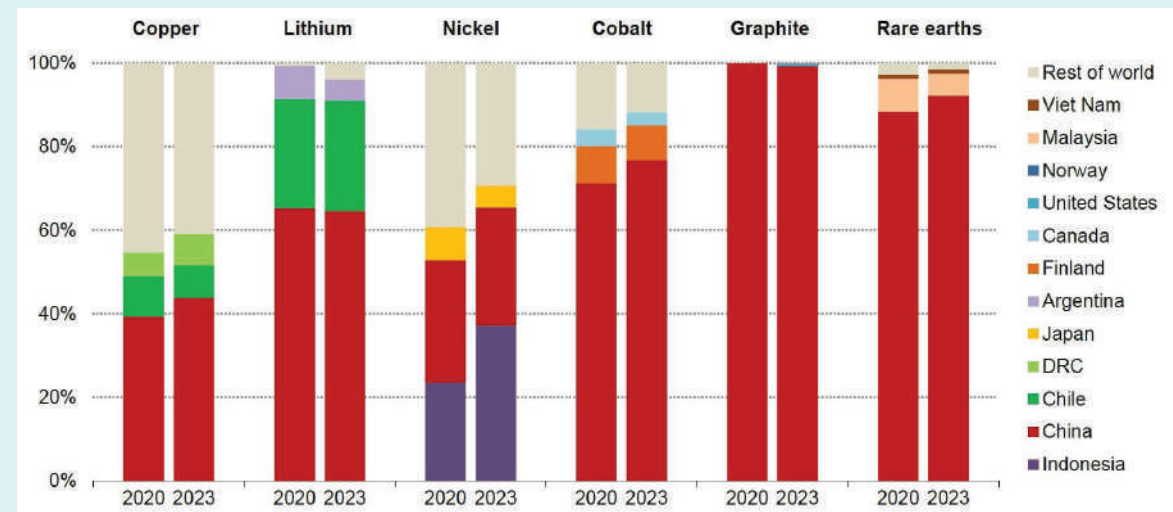
Magnets made from these are used in achieving higher energy efficiency for automotive traction motors in EVs and wind turbine motors. According to IEA projections, these are likely to remain heavily geographically concentrated in the future (Figure 7). Meanwhile, 2023 also witnessed a proliferation of trade restriction measures on the ores as well as technologies for processing them, which has implications for the availability and access to essential raw materials for solar PV, wind turbines, EVs, and other consumer goods. This concentration of rare earth and critical minerals in mining and processing is a significant constraint on the use of renewables and EV ambitions for most countries, including India.

Chart VI.5: Geographical distribution of critical mineral global supply chains, 2023⁶³



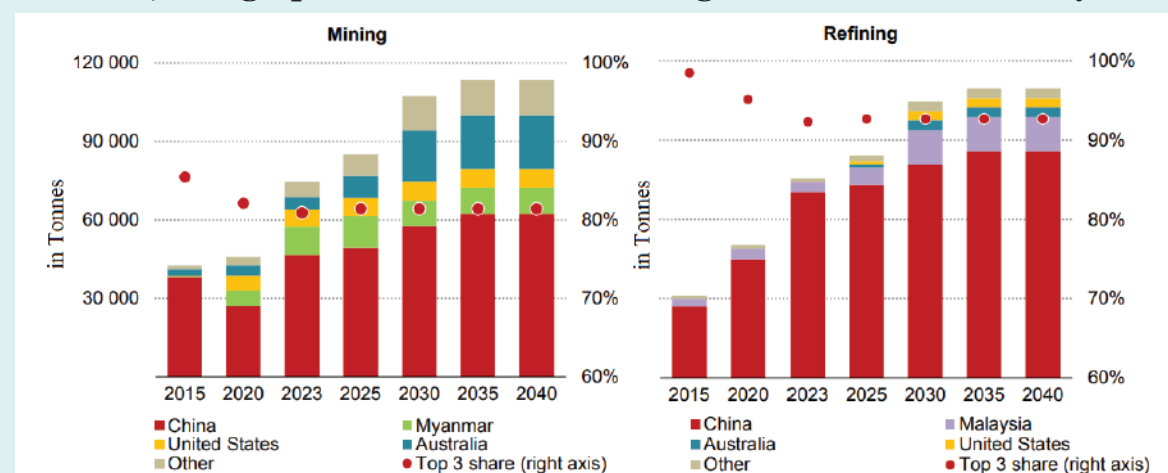
Source: IEA’s Global Critical Minerals Outlook 2024

Chart VI.6: Share of refined material production by country in 2020 and 2023



Source: IEA’s Global Critical Minerals Outlook 2024

63 Notes: Li = lithium; Ni = nickel; Co = cobalt; Gr = graphite; DRC = Democratic Republic of the Congo. Geographical breakdown refers to the country where the production occurs. Mining is based on production data. Material processing is based on refining production data. Cell component production is based on cathode and anode material production capacity data. Battery cells are based on battery cell production capacity data. EVs based on electric cars production data. For all minerals mining and refining shows total production not only that used in EVs. Graphite refining refers to spherical graphite production only.

Chart VI.7: Geographical concentration of Magnet rare earths over the years⁶⁴

Source: IEA's Global Critical Minerals Outlook 2024. The left axes represent quantity; right axes represent shares of the Top 3 countries.

6.37. Other than risks related to access to technology and raw materials, availability and access to affordable finance are arguably the most significant challenges to India's development of a low-carbon path. There are several estimates about the financial requirements for the transformation of India's energy system to align with the Net Zero announcement. They all point to one fact – the requirements are of the order of trillions. As per the NITI's IESS 2047 model, India's total investment cost until 2047 is conservatively estimated at ~ USD 250 billion per year to prepare its energy systems for Net-Zero pathways.

Box VI.5: Report on Synchronizing Energy Transitions towards Possible Net-Zero for India: Affordable and Clean Energy for All

A study titled 'Synchronizing energy transitions toward possible Net Zero for India: affordable and clean energy for all' was conducted by the Indian Institute of Management Ahmedabad with the support of the Office of the Principal Scientific Adviser to the Government of India and the Nuclear Power Corporation of India Ltd. The report contains the projection of the energy mix in the backdrop of India's Net Zero 2070 announcements and cleaner, affordable energy for all. The projected future energy basket for 2030, 2050, and 2070 across various growth and climate commitment scenarios have been presented in the report.

Main Conclusions of the Report

1. A sustainable energy transition needs the co-existence of several energy sources.
2. Coal is projected to continue until the next two decades as the backbone of the Indian energy system. Although technologies such as Carbon Dioxide Removal technologies (CDRs), such as Bioenergy with CO₂ Capture & Storage (BECCS), and CCUS need to be explored to reduce the emissions from the use of coal. However, the energy penalty⁶⁵ for deploying BECCS/CCUS at power plants would need a closer examination.

⁶⁴ Note: Graphite is based on spherical graphite for battery grade. Rare earths are magnet rare earths.

⁶⁵ The energy penalty is the extent of energy required to power the CCUS technologies.

3. Renewable Energy (RE) and nuclear power are expected to be the predominant sources of energy by 2070.
4. Coal phase-down will be heavily dependent on the import of critical minerals required for renewable energy and battery storage unless the country invests in the development of technologies based on domestically available mineral resources and those that enable the reuse, recovery, and recycling of critical minerals.

Finance for Sustainable Development

6.38. The country has taken many measures to improve the business environment and catalyse greater quantum of resources. The 'Framework for Sovereign Green Bonds' released in 2022 has enabled the mobilisation of resources from diversified investors for green projects, deepening the bond market. The framework has been rated as 'Medium Green' with a 'Good' governance score by CICERO, a Norway-based Second Party Opinion provider, highlighting India's credibility and readiness to issue sovereign green bonds. The Government undertook the issue of sovereign green bonds amounting to ₹16,000 Crore in January-February 2023 to raise proceeds for public sector projects that would contribute to the efforts to reduce the intensity of the economy's emissions, followed by ₹20,000 Crore raised through sovereign green bonds in October-December 2023.

6.39. SEBI has been one of the early adopters of sustainability reporting for listed entities and has required mandatory ESG-related disclosures for the top 100 listed entities (by market capitalisation) since 2012. Over the years, SEBI strengthened the reporting to cover the top 500 and then the top 1000 entities. SEBI issued new sustainability reporting requirements under the Business Responsibility and Sustainability Report (BRSR), which are more granular with quantifiable metrics in line with the principles enshrined in the 'National Guidelines on Responsible Business Conduct'. The BRSR was mandatory for the top 1000 listed entities (by market capitalisation) from 2022-23. In July 2023, the SEBI also introduced the BRSR core for ESG disclosures for value chains. From 2024-25, these disclosure requirements apply to the top 250 listed companies and will be extended to the 1000 top-listed entities in a phased manner by 2026-27. The value chain shall encompass a listed entity's top upstream and downstream partners, cumulatively comprising 75 per cent of its purchases/sales (by value), respectively. The BRSR Core is a sub-set of the BRSR, consisting of a set of Key Performance Indicators (KPIs)/metrics under specific ESG attributes.⁶⁶

6.40. RBI has implemented the Framework for Acceptance of Green Deposits for the Regulated Entities to foster and develop a green finance ecosystem in the country. In addition, the RBI promotes renewable energy through its Priority Sector Lending (PSL) rules. The notified PSL rules by RBI facilitate concessional credit for renewable energy generation and certain mitigation projects. This includes, for example, bank loans up to a limit of ₹30 Crore to borrowers for purposes like solar-based power generators, biomass-based power generators, windmills, and micro-hydel plants. Non-conventional energy-based public utilities, such as street lighting systems and remote village electrification, are also eligible for priority sector classification per the notification.

⁶⁶ BRSR Core - Framework for assurance and ESG disclosures for value chain, SEBI, https://www.sebi.gov.in/legal/circulars/jul-2023/brsr-core-framework-for-assurance-and-esg-disclosures-for-value-chain_73854.html

PUTTING IN PLACE A MARKET FRAMEWORK TO PRICE CARBON: INDIAN CARBON MARKET (ICM)

6.41. The regulations on the Carbon Credit Trading Scheme (CCTS), also called the Indian Carbon Market, were notified by the Ministry of Power on 28 June 2023. The objective of CCTS is to allow the determination of a price for one tonne of carbon dioxide equivalent emissions, encouraging an obligated entity to factor in the cost of a resource that was not priced earlier, thereby incentivising investment in alternative low-emission technologies. CCTS will subsume the existing PAT scheme, where the Designated Consumers (DCs) under the PAT scheme will gradually transition to CCTS by 2028-30. Under the CCTS, the Government shall set entity-wise GHG emission intensity targets to enable a per-output emissions limit (i.e., GHG emissions intensity target) in place of specific energy consumption targets under the existing PAT scheme. Key institutions and stakeholders that will play a crucial role in the oversight, implementation, and guidance of the ICM are as follows (Table 1):

Table VI.1: Institutional Architecture of Carbon Market in India

Function	Institution
Governance, oversight and functioning	National Steering Committee for the Indian carbon market
Policy & administrator	Bureau of Energy Efficiency
Implementor of targets	Obligated entity
Trading regulator	Central Electricity Regulatory Commission
Registry	Grid Controller of India Limited (GCIL)
Trading platform	Power exchange – IEX, PXIL, HPX

6.42. The CCTS envisages a compliance mechanism whereby the registered entities notified under the mechanism, called obligated entities (OE), will be notified of GHG emission intensity targets for each annual year in the trajectory period (called the compliance year). On completion of the trajectory period, the targets shall be revised for subsequent periods. The obligated entities would be required to comply and furnish the compliance status with the targets set after the verification and trading process within nine months from the completion of the compliance cycle. The entity obligated to achieve greater than the target notified can get the Carbon Credit Certificates (CCC) issued by the difference between the actual and target. These CCCs can be sold in the carbon market or banked by the obligated entity on completion of the compliance year. The banked CCCs can be sold or used to achieve compliance in the following years. An obligated entity failing to meet the targets would be required to buy the CCCs in the Indian carbon market or use their banked CCCs for compliance.

Voluntary Carbon Market (VCM)

6.43. Carbon markets can be compliance markets run and regulated by governments or international bodies, with specific industries required to participate (compliance market), or could be voluntary carbon markets- which are not regulated by governments and are entirely voluntary. The global voluntary carbon market is worth over USD 1.2 billion, and India is the second-largest supplier of carbon offsets.

6.44. A VCM allows entities to compensate for their emissions through emission reduction/removal/avoidance achieved in projects elsewhere or by other entities – a process termed ‘carbon offsetting’. The purchaser of an offset credit can retire the offset to claim the underlying reduction towards their own emission reduction goals. However, there are concerns about double counting in VCM when sellers and buyers can claim the carbon reductions. There is also uncertainty about whether a credit being used as an offset by a foreign entity can be simultaneously claimed by the country where the credit was generated for their emission reduction target. If this is not, then with India’s ambitious NDC and Net Zero announcement, carbon credits sold to foreign entities will make India’s emissions reduction more expensive and difficult.

Box VI.6: Evolution of Carbon Markets

The existence of the first market-based regulation to abate the air pollution level and address environmental problems can be traced back to the sulphur dioxide (SO₂) allowance trading programme by the United States in the 1970s. The Montreal Protocol (1987) served as an early international precedent for trading emissions permits to address ozone depletion. Article 4.2(a) of the UNFCCC (Convention) set the foundation for early carbon markets by allowing the Parties to implement emission reduction policies jointly.

The Conference of the Parties or COP of the UNFCCC adopted a legal instrument in this regard - the Kyoto Protocol (KP) in 1997. The KP established legally binding GHG emissions reduction targets for 38 industrialised countries and Economies in Transition (EIT) – Annex-B Parties to the KP. Market-based mechanisms under the KP allowed Parties to meet part of their Kyoto caps with ‘Kyoto units’ bought from other Parties. It had three mechanisms – (i) Clean Development Mechanism (CDM) leading to Certified Emission Reductions (CERs) from mitigation projects in developing countries,⁶⁷ (ii) Joint Implementation creating Emission Reduction Units (ERUs) achieved by projects in countries with emission caps, and (iii) International Emissions Trading (IET) enabled trading of Assigned Amount Units (AAUs) and other Kyoto units between countries with emission caps. These mechanisms laid the foundation for the first-ever effort in the international carbon market, though its initial implementation faced challenges like limited participation and complex rules. However, after the launch of the European Union Emission Trading Scheme (EU-ETS) in 2005, the significance of the carbon market was realised for the first time. It was around the mid-2000s that EU-ETS started functioning, and Voluntary Carbon Markets began to gain traction. The fungibility of the credits with EU-ETS helped the Kyoto Protocol to establish a stronger carbon price in its first commitment period (2008-2012).

The second commitment period (2013-2020) of the KP was adopted in December 2012, while the EU-ETS entered its third phase in 2013-2020. The cumulative inflow of international credits led to a large surplus in the European carbon market and undermined the carbon price incentive; for example, prices fell from €15/tCO_{2e} in 2011 to a price range of €3 - €8/tCO_{2e} in the 2013 - 2015 period. The EU decided not to allow CERs and ERUs from KP to be compliance units within the EU-ETS and made it mandatory to exchange the Kyoto units for EU-ETS emission allowances. The second phase of the KP’s carbon markets failed mainly

⁶⁷ Developing countries did not have obligation to cap emissions.

due to the non-participation of some major developed economies and due to the non-interchangeability of the Kyoto credits with EU-ETS⁶⁸. With the end of the KP in 2020, the CDM also dried up and was replaced by the unregulated buyers and sellers of the carbon market, the VCM.

The Paris Agreement, adopted in December 2015, provides countries the option to voluntarily cooperate for higher ambition in their NDCs through a unified global carbon market.

- a. Article 6.2 calls for ‘voluntary cooperative approaches’ at the bilateral level involving the use of Internationally Transferred Mitigation Outcomes (ITMOs)⁶⁹ in meeting NDCs, promoting sustainable development, and ensuring environmental integrity and transparency while avoiding any double counting.
- b. Article 6.4 defines an international mechanism to issue emission credits against mitigation outcomes. Article 6.4 of the Paris Agreement mechanism thus became the successor to the Kyoto Protocol’s CDM.⁷⁰ If authorised by the host country, the emission credits (or Emission Reductions) generated by mitigation activities become ITMOs. Another country can use them to fulfil its NDC or for other mitigation purposes, and calls for the corresponding adjustment in the origin county to avoid any double counting.

Negotiations are still ongoing on the implementation of Articles 6.2 and 6.4.

6.45. The carbon market's effectiveness in emission reduction in India will depend on its regulation and implementation in the context of the target of Viksit Bharat by 2047 and Net Zero by 2070. While the domestic compliance market developed under the CCTS is essential to ensure that the industry internalises the emission costs into its production and investment decisions, we may not subsidise the transition of other countries.

6.46. The Government of India’s Mission LiFE is envisaged as a mass movement to address climate change and foster sustainable living based on conservation and moderation principles. The Government supports voluntary environmental actions such as the Green Credit Programme (GCP), which incentivises individuals, communities, private sector industries, and companies to participate in environment-positive activities by offering green credits as rewards. Box 7 presents a brief discussion on GCP.

Box VI.7: LiFE in Action: India's Innovative Green Credit Program⁷¹

The LiFE movement is a grassroots, mass initiative to combat climate change and promote sustainable living rooted in conservation and moderation. To bolster this effort and encourage eco-friendly practices, the Ministry of Environment, Forest and Climate Change

68 Use of international credits in EU ETS after 2020, European Commission, <https://tinyurl.com/55mn5s79>.

69 Internationally transferred mitigation outcomes are units for emissions trading between Parties to the Paris Agreement

70 Michaelowa, A., Samaniego, X., Kessler, J., Ahonen, H. M., Spence, C., & European Capacity Building Initiative. (2022). Pocket Guide to Article 6. Under the Paris Agreement. <https://www.zora.uzh.ch/id/eprint/230043/>

71 Gazette notification by MoEFCC, 26 June 2023 <https://egazette.gov.in/WriteReadData/2023/246825.pdf>

introduced two pioneering programs: the Green Credit Programme (GCP) and the Ecomark Scheme.⁷²

Objectives of GCP: The GCP is an innovative market-based mechanism aimed at encouraging individuals, communities, private sector industries, and companies to engage in voluntary environmental positive actions through the issuance of green credits.

Implementation and governance: According to the Green Credit Rules, 2023, notified in October 2023, GCP shall be implemented through a phased and iterative approach. In the initial phase, it focuses on voluntary tree plantation on degraded land, wasteland, watershed, etc., under the control and management of the Forest departments. The governance structure of GCP includes the Steering Committee members from concerned ministries, experts, and institutions. Indian Council of Forestry Research and Education (ICFRE) is designated as the GCP administrator and is responsible for the implementation and management of GCP. GCP's digital processes include a dedicated web platform and a green credit registry for streamlining operations. Registration, accounting, and green credit issuance monitoring ensure the transparency and accountability of GCP. The generation of green credits under Green Credit Rules, 2023, is independent of the carbon credit under the Carbon Credit Trading Scheme, 2023.

A 'Green Credits Programme' was co-hosted by India and UAE on the side-lines of COP-28. India invited all nations to join the global green credit initiative, aimed at facilitating global collaboration, cooperation, and partnership through the exchange of knowledge, experiences, and best practices in planning, implementing, and monitoring environment-positive actions through programs/mechanisms like Green Credit. Chapter 13, a special essay, makes the case for the international relevance of LiFE.

INTERNATIONAL COMMITMENTS ON CLIMATE FINANCE: THE DEVELOPMENTS

6.47. Lack of access to adequate and affordable financial resources remains a significant constraint for developing countries in implementing their climate commitments. The Standing Committee on Finance (a body under the UNFCCC) has estimated that resources from USD 5.8 trillion to USD 11.5 trillion are required till 2030 to meet the targets set by developing countries in their NDCs and other communications. The 2023 UN Adaptation Gap Report estimated adaptation costs in developing countries to be 10 to 18 times greater than current international adaptation finance flows of USD 21.3 billion.⁷³ The UNFCCC and its Paris Agreement mandate that developed countries provide financial resources on a grant or concessional basis and provide access to technologies to developing countries to enable their climate actions. The first GST outcome also underscored the current needs of developing countries and the criticality

⁷² Notification issued for Green Credit Program (GCP) and Ecomark scheme Under LiFE Initiative to Promote Sustainable Lifestyle and Environmental Conservation, October 13, 2023, PIB, <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1967476>

⁷³ United Nations Environment Programme (2023). Adaptation Gap Report 2023: Underfinanced. Underprepared. Inadequate investment and planning on climate adaptation leaves the world exposed. Nairobi. <https://doi.org/10.59117/20.500.11822/43796>.

of new and additional, grant-based, highly concessional finance and non-debt instruments in supporting developing countries. The finance flows to developing countries from developed nations have been very meagre. Currently, most of the international finance available for developing countries is in the form of loans rather than grants.

6.48. The preliminary estimates of the overall resource requirement, as stated in the country's NDC, is USD 2.5 trillion for 2015-2030. The Long-Term Low Emission Development Strategy (LT-LEDS) submitted by the country highlighted that financial resources of the order of tens of trillions of dollars would be required by 2050 for India's transition towards a low-carbon development pathway. India's 1st Adaptation Communication (AC) submitted to UNFCCC mentioned the cumulative need for expenditure for adaptation to be ₹56.68 trillion by 2030. However, much of the resource flow for climate action - mitigation and adaptation - is primarily from domestic resources.

6.49. Available, accessible and affordable financial resources are essential to meet the needs of developing countries. UNFCCC and its Paris Agreement mandate that developed countries provide the resources and take the lead in mobilising finance through various sources. However, much of the climate action by developing countries has been done through domestic resources, and the emphasis of the developed countries has mainly been on private finance taking the lead in financing climate action. Given the scale of financial requirements, the ability of private capital to meet the needs even partially remains debatable. Further, the cost of such capital would have implications on the macroeconomic stability of the developing countries. While recognising the importance of private capital, a working paper by the Centre for Social and Economic Progress⁷⁴ identifies various challenges for developing countries in attracting it such as limited depth of their financial markets and vulnerable debt profiles. There is further evidence⁷⁵ to suggest that even MDBs mobilised less than a dollar from the private sector for every dollar of committed finance by MDBs for climate action. As reflected in an article in the Financial Times- *'There's too much to do, and given the urgency and the need to get the solution right, this isn't a task for favourite ESG-focused portfolio manager ... The sheer scale of the physical infrastructure that must be revamped, demolished or replaced is almost beyond comprehension. Governments, ..., will have to lead The Western nations that did so much of the damage will have to finance the transition in the developing world – it is astonishing that this idea is still debated.'*⁷⁶

CoP 28 and the Global Stocktake

6.50. The 28th session of the Conference of Parties (COP 28) to the United Nations Framework Convention on Climate Change (UNFCCC) was held in Dubai, UAE. The primary outcome of COP 28 included the decision on the outcome of the first GST, which seeks to ratchet up global climate ambition before the end of the decade, implemented in a nationally determined manner, taking into account the Paris Agreement and their different national circumstances. Another

74 Natarajan, G., and Anantha Nageswaran, V., (2023). Harnessing private capital for global public goods: Issues, challenges and solutions (CSEP Working Paper 57). New Delhi: Centre for Social and Economic Progress, <https://csep.org/wp-content/uploads/2023/10/Harnessing-private-capital-for-global-public-goods-1.pdf>.

75 2019 Joint report on multilateral development banks climate finance. (2020). <https://www.ebrd.com/2019-joint-report-on-mdbs-climate-finance>.

76 Brower, D., Chu, A. & McCormick, M, The energy transition will be volatile, The Financial Times, (2023, June 29). <https://www.ft.com/content/86d71297-3f34-48f3-8f3f-28b7e8be03c6>.

significant outcome of COP 28 is the agreement on operationalising the Loss and Damage Fund and its funding arrangements. In line with the mandate under the Paris Agreement to develop a Global Goal for Adaptation (GGA), COP 28 finalised the Emirates Framework for Global Climate Resilience. The decision calls for all countries to have adaptation plans by 2030. Parties agreed on targets for the Global Goal on Adaptation, reflecting a global consensus on adaptation targets and the need for finance, technology, and capacity-building support to achieve them.

6.51. Under the first GST, the Parties took decisions on different themes of climate action, viz., mitigation, adaptation, and means of implementation, including finance, capacity building, technology development, and technology transfer. Under finance, the GST decision recalls that developed country Parties shall provide financial resources to assist developing country Parties in continuing their obligations concerning mitigation and adaptation under the Convention (UNFCCC). The decision also recognises that adaptation finance must be significantly scaled up to support the urgent and evolving need to accelerate adaptation and build resilience in developing countries. Under mitigation, the decision calls upon Parties to contribute to the tripling of global renewable energy capacity, accelerating efforts towards the phase-down of unabated coal power, phasing out inefficient fossil fuel subsidies, etc. These decisions are to be implemented in a nationally determined manner, taking into account the different national circumstances, pathways, and approaches of the Parties. The decision also noted that measures taken to combat climate change, including unilateral ones, should not constitute arbitrary or unjustifiable discrimination or a disguised restriction on international trade.

New Collective Quantified Goal (NCQG)

6.52. A New Collective Quantified Goal (NCQG) on climate finance is being negotiated under the UNFCCC to decide an annual goal of climate finance to be mobilised by the developed countries for the developing countries from 2025 onward. The mandate is to set a new quantified goal from the floor of USD 100 billion per year, considering the needs and priorities of developing countries aiming to strengthen the global response to the threat of climate change in the context of sustainable development and efforts to eradicate poverty. Developing countries seek a) an ambitious mobilisation goal that adequately addresses their needs, b) grant-based or highly concessional and accessible financial resources, and c) a balance between the financing of mitigation and adaptation actions. These aspects have also been articulated in the discussions under the Indian presidency of the G20 and are duly reflected in the Delhi Declaration.

INDIA'S INTERNATIONAL INITIATIVES TO ADDRESS CLIMATE CHANGE ISSUES

6.53. India has led several international initiatives towards climate change mitigation and building resilience. Some of these are discussed as follows:

1. The International Solar Alliance (ISA) was established by a joint initiative of India and France in 2015 to deploy solar energy solutions. It is a treaty-based inter-governmental organisation with 119 Member and Signatory countries. The organisation aims to unlock USD one trillion of investments in solar by 2030 by crowding in private sector investment through guarantees, buildings capacities and through measures to reduce the cost of technology adoption. Its

programmatic support has identified a pipeline of 9.5 GW of solar energy capacity in its member countries. ISA assists in setting up solar energy demonstration projects with a grant of USD 50,000 for its Members categorised as Least Developed Countries (LDCs) or Small Island Developing States (SIDS). As of March 2024, 19 solar energy demonstration projects are under implementation. ISA also works on capacity building, and as part of this effort, around 4,000 professionals from around the globe have been trained on various aspects of the solar energy industry. ISA has successfully established the Solar Technology and Application Resources Centres (STAR-C) in Ethiopia and Somalia.

2. One World, One Sun, One Grid (OSOWOG) is an ambitious project led by India and the UK to interconnect solar energy systems on a massive scale. The vision behind the OSOWOG is the mantra that 'the sun never sets', and the idea is to harness solar and other renewable energy sources from different parts of the world, where the sun is shining at any given moment, and efficiently transmit that power to areas where it is needed. The OSOWOG initiative is to be carried out in three phases. In the first phase, the Indian grid would be connected to the Middle East, South Asia, and South-East Asia grids to develop a common grid. The second phase would connect the functional first phase to the pool of renewable resources in Africa, and finally, the third phase would look at achieving true global interconnection with the aim of 2,600 GW of interconnection by 2050.⁷⁷
3. The Coalition for Disaster Resilient Infrastructure (CDRI) was launched by India during the United Nations Climate Action Summit on 23 September 2019. It is a global partnership of National Governments, UN agencies and programmes, multilateral development banks and financing mechanisms, the private sector, and academic and knowledge institutions that aims to promote the resilience of new and existing infrastructure systems to climate and disaster risks in support of sustainable development. CDRI aims to enhance infrastructure resilience through capacity building, informed policy, planning, and management, leading to improved quality of the environment, livelihoods, and lives of over three billion people by 2050. The organisation released its first Biennial Report on Global Infrastructure Resilience in 2023. It is CDRI's contribution towards monitoring the SDGs, the Paris Agreement, and the Sendai Framework targets. Other interventions include financial support for peer learning, capacity development opportunities and sectoral programs on power, transport, telecommunication, health, and urban infrastructure. Further, 11 projects were awarded across 13 SIDS in 2023, in partnership with USAID and Miyamoto International, under the Disaster Resilient Infrastructure (DRI) connect, a one-stop digital knowledge exchange, learning, and co-creation platform. The Infrastructure Resilience Academic Exchange (IRAX) Programme has been conceived as a structured engagement initiative with global academic institutions to offer value-added education, research opportunities, and professional development on DRI. As part of this, in 2023, USD 5 million was provided by USAID to support a partnership between US universities and Indian higher education institutions to offer education, research, training, and professional development opportunities on DRI.⁷⁸

⁷⁷ One World, One Sun, One Grid (OSOWOG), International Solar Alliance, <https://isolaralliance.org/work/osowog/>

⁷⁸ Based on information received from the Coalition for Disaster Resilient Infrastructure (CDRI)

4. The Infrastructure for Resilient Island States' (IRIS), led by India, is a flagship strategic initiative of CDRI and Small Island Developing States (SIDS) designed to achieve and deliver resilience and climate adaptation solutions to the SIDS, which are among the most vulnerable and exposed countries. Launched in 2021, IRIS is already supported by commitments of USD 35 million from Australia, India, the EU, and the UK, with a target to attract and deploy USD 50 million to support SIDS by 2030.⁷⁹
5. Realising the importance of partnership between the Government and industry to achieve the goal of Net Zero, the Leadership Group for Industry Transition (LeadIT) was launched by the governments of India and Sweden in September 2019. LeadIT brings together countries and companies committed to action to achieve the goals of the Paris Agreement. At COP 28, India and Sweden launched the second LeadIT (LeadIT 2.0) phase for 2024-26, marking a joint commitment by member countries and companies to shape policy frameworks and international cooperation for an inclusive industry transition. This new phase will focus on inclusive and just industry transition, co-development & transfer of low-carbon technology, and financial support for industry transition in emerging economies.

CONCLUSION

6.54. As India aims to achieve its ambitious growth targets, it faces the dual challenge of meeting energy demands while reducing carbon emissions. Given the close linkage between energy consumption and various social indicators, the Government has a priority to ensure access to sustainable and clean energy sources. Non-fossil fuel sources are critical to India's ambitious NDCs and Net Zero commitment. However, phasing in of non-fossil sources has its challenges – intermittency related to renewables, handling of nuclear and solar panel waste, implications of biofuel production on food security, etc. Depending on the evolving and ambitious NDC targets and the objective of ensuring energy security, it is amply clear that India needs to target a diversified set of energy sources. Such diversification will help minimise risks associated with energy systems while pursuing low-emission pathways in line with national commitments. The integration of renewables, alongside exploring nuclear energy and biofuels, presents a path towards achieving these objectives. This will also include a significant role for thermal power, especially coal-based power plants, in providing base-load to support large-scale deployment of renewables.

6.55. In exploring the landscape for ensuring energy security, it has become evident that risks are not merely obstacles but also harbingers of opportunities. While uncertainties loom, they present avenues for innovation, adaptation, and growth for India. While phasing in renewables to the extent possible is imperative, in the short to medium term, the focus should also be on actively adopting clean coal technologies. The Government's initiatives for (cleaner) coal, such as the Coal Gasification Mission, extraction of Coal Bed Methane gases, exploring Coal to Hydrogen, Carbon Capture and Storage (CCS), and Coal beneficiation through washeries, etc. to mitigate emissions and enhance environmental sustainability needs to be promoted. With the advent of ultra super-critical technologies for coal power plants, it would be possible to lower emissions and achieve higher efficiency.

⁷⁹ Infrastructure for Resilient Island States (IRIS), UN Department of Economic and Social Affairs, Sustainable Development, <https://sdgs.un.org/partnerships/infrastructure-resilient-island-states-iris>.

6.56. India's successful renewable energy growth story is well-established. Solar power installed capacity has increased drastically by over 25 times between 2014 to 2023. However, several risks are associated with the large-scale phasing-in of renewables, such as intermittency, grid integration, backup power generation, storage, etc. It is important to supplement with other non-fossil fuel sources such as Nuclear, Biofuels, and Hydrogen.

6.57. It should not be that India's high dependency on imports mainly for petroleum for its energy needs, shifts to high import dependency for Solar PV panels and critical minerals (systemic risks), whose supply chain and geopolitics may be even trickier. India needs to target diversified energy sources, including renewables (Solar, Wind, Large and Small Hydro), green hydrogen, nuclear, and biofuels. Such diversification will help minimise risks associated with energy systems while pursuing low-emission pathways in line with national commitments. The diversification also includes a significant role for thermal power in providing the base load to support large-scale deployment of renewables.

6.58. Many technologies required for global Net Zero are commercially unavailable, such as hydrogen-fuelled Steel/Cement, Steel and Aluminium production with CCUS, etc. There is a need to enhance international cooperation in R&D, especially in the domains of distributed RE, offshore wind, geothermal, tidal energy, biofuels, Compressed Bio Gas, green hydrogen, energy storage, electrolyzers, and nuclear power (including Small Modular Reactors SMR).

6.59. Availability, affordability, and accessibility of financial resources will drive the green transition. While India has relied upon its resources so far, it is vital that resources from developed countries and mobilised by the latter flow to the developing countries in line with the objectives of the UNFCCC and its Paris Agreement. The negotiations on the New Collective Quantified Goal must lead to outcomes required to meet the temperature goal of the Paris Agreement. The global narrative on the issue of climate change, describing it as a climate emergency, shifts focus from the equally, if not more, critical developmental problems and can cause panic.^{80,81} The world needs a more balanced approach to the issue of climate change. It should also focus on nearer-term policy goals of improving human welfare rather than being excessively preoccupied with one large, longer-term goal of global climate management.

80 Hulme, M. (2023). Climate change isn't everything: Liberating climate politics from alarmism. John Wiley & Sons.

81 V. Anantha Nageswaran, Climate change: Scaring people will only yield scars and no solutions, MINT, (Apr 16, 2024), <https://www.livemint.com/opinion/online-views/climate-change-scaring-people-will-only-yield-scars-and-no-solutions-11713237716747.html>.

SOCIAL SECTOR: BENEFITS THAT EMPOWER

India's high and sustained economic growth in recent years is being accompanied by social and institutional progress, underpinned by transformational and effective implementation of Government programmes with an empowering edge that has become the hallmark of a transformed approach to welfare. Be it health, education, sanitation, digital empowerment, or quality of life in rural areas, each aspect of the social infrastructure ecosystem has made strides through effective planning and delivery of various welfare schemes. The outcomes and success stories of the endeavours being made by the Government to ensure ease of living for one and all are evident. The realms of health and education are witnessing turning points in quality and access. Women-led development is being promoted with 360-degree enabling interventions for socioeconomic empowerment. A slew of programmes for transparent and digitalised rural governance have accompanied a perceptible improvement in the standard of living. To attain the much-avowed status of a developed country by 2047, effective and efficient Government programmes and state-level initiatives, augmented by community participation, are key.

INTRODUCTION

7.1 India is on the path to scaling the next level of the development ladder to a 'Developed India' step by 2047 (ViksitBharat@2047). Economic growth is a pathway to achieve the end goal of development comprising economic, social, technological, and institutional progress. However, the direction of public policy and its implementation are also instrumental in translating growth to across-the-board human development. Home to 18 per cent of humanity¹, India's social infrastructure must reach a diverse and expansive populace, transcending cultures, languages, and geographies. Boasting a young and aspirational society, India aims to seize the opportunities provided by steady and high economic growth while also ensuring a society characterised by better health care, education, clean water, sanitation facilities, affordable housing, electricity, and the internet. A vast amount of ground has been covered to ensure sustainable and equitable economic growth and the journey continues with challenges, old and new, as well as solutions, centralised and local.

7.2 Over the last decade, the Indian concept of welfare has been significantly transformed into a more long-term-oriented, efficient, and empowering avatar. This has further strengthened the welfare ecosystem and helped lay a solid foundation for human development in the country.

¹ UN estimate <https://www.un.org/en/global-issues/population>

Besides, the Government's social sector expenditure has been keeping pace with the sector's growing importance. The Government's spending on social services has shown a rising trend since FY16, with a focus on many aspects of the social well-being of citizens of the country, as evident from Table VII.1. Between FY18 and FY24, nominal GDP has grown at a compounded annual growth rate (CAGR) of around 9.5 per cent. Overall, welfare expenditure has grown at a CAGR of 12.8 per cent. Expenditure on education has grown at a CAGR of 9.4 per cent- a tad below the rate of nominal GDP growth. Expenditure on health, as shown in the Table below, has grown at a CAGR of 15.8 per cent.

Table VII.1 Trends in social services expenditure by general Government
(Combined Centre and States)

(₹ crore)

Items	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23 (RE)	2023-24 (BE)
Total Expenditure	45,15,946	50,40,747	54,10,887	63,53,359	70,98,451	83,76,972	90,45,119
Expenditure on Social Services²	11,39,524	12,78,124	13,64,906	14,79,389	17,87,019	21,49,346	23,50,584
of which:							
<i>Education³</i>	4,83,481	5,26,481	5,79,575	5,75,834	6,39,436	7,68,946	8,28,747
<i>Education (MoE's estimates)*</i>	6,621,51	7,36,581	8,63,118 (RE)	9,19,145 (BE)			
<i>Health⁴</i>	2,43,388	2,65,813	2,72,648	3,17,687	4,56,109	5,12,742	5,85,706
<i>Others</i>	4,12,655	4,85,829	5,12,683	5,85,868	6,91,474	8,67,659	9,36,131
As per cent of GDP							
Expenditure on Social Services	6.7	6.8	6.8	7.5	7.6	8.0	7.8
of which:							
<i>Education</i>	2.8	2.8	2.9	2.9	2.7	2.9	2.7
<i>Education (MoE's estimates)*</i>	3.9	3.9	4.3 (RE)	4.6 (BE)			
<i>Health</i>	1.4	1.4	1.4	1.6	1.9	1.9	1.9
<i>Others</i>	2.4	2.6	2.6	3.0	2.9	3.2	3.1

2 Social services include education, sports, art, and culture; medical and public health, family welfare; water supply and sanitation; housing; urban development; the welfare of SCs, STs and OBCs, labour and labour welfare; social security and welfare, nutrition, relief on account of natural calamities, etc.

3 Expenditure on 'Education' pertains to expenditure on 'Education, Sports, Arts, and culture.

4 Expenditure on 'Health' includes expenditure on 'Medical and Public Health', 'Family Welfare', and 'Water Supply and Sanitation.

Items	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23 (RE)	2023-24 (BE)
As per cent of total expenditure							
Expenditure on Social Services	25.2	25.4	25.2	23.3	25.2	25.7	26.0
of which:							
<i>Education</i>	10.7	10.4	10.7	9.1	9.0	9.2	9.2
<i>Health</i>	5.4	5.3	5.0	5.0	6.4	6.1	6.5
<i>Others</i>	9.1	9.6	9.5	9.2	9.7	10.4	10.3
As per cent of social services							
<i>Education</i>	42.4	41.2	42.5	38.9	35.8	35.8	35.3
<i>Health</i>	21.4	20.8	20.0	21.5	25.5	23.9	24.9
<i>Others</i>	36.2	38.0	37.6	39.6	38.7	40.4	39.8
Source: RBI							
Note: (i) The ratios to GDP at current market prices are based on 2011-12 base till 2021-22. GDP for 2022-23 is as per the Union Budget 2022-23.							
(ii) * The Ministry of Education (MoE), Government of India, also calculates the General Government spending on education. While RBI's data on Education expenditure incorporates the spending incurred by Centre and States on 'Education, Sports, Arts, and culture, MoE's estimates also include expenditure incurred on medical and public health education, agriculture research and education, welfare of SC, ST, OBC & Minority's education, other scientific research & development, Education under social security, Nutritious food expenditure under mid-day meal, expenditure on imparting training to police, Labour employment and skill development expenditure, education/training expenditure under rural development Programmes etc. This leads to a higher estimate of expenditure on education, which is 4.64 per cent of GDP in 2020-21 (latest available).							

7.3 This chapter presents the impact of the high economic growth in recent years on the citizens of the country. Section I discusses some critical outcomes in the overarching area of the standard of living of the populace. Some key areas, such as health, and education, are covered in some detail. In light of the emphasis on *Nari Shakti*, Section II dwells on the rising women power in the country and the active role of Government policies and programmes in this regard. A large population of the country resides in rural India. The developments happening at the grassroots level and the role of Government policies and programmes for rural India are presented in Section III.

DOVETAILING GROWTH WITH EMPOWERING WELFARE: A PARADIGM SHIFT

7.4 Demchok village in Leh, located at a height of 13,800 feet where mercury can drop up to minus 40 degrees, got its first tap water connection in July 2022 under the Jal Jeevan Mission, freeing up women from the drudgery of fetching water. A remote tribal village of Bulumgavan in Maharashtra received electric supply only in 2018, 70 years after independence!

7.5 There are numerous such stories of the common citizens reaping the harvest of the Government's empowering approach to welfare. With India becoming the fifth largest economy,

the lives of average Indians are better than a decade ago. Over 10.3 crore women have been provided free-of-cost gas connections under PM Ujjwala Yojana, 11.7 crore toilets have been built under Swachh Bharat Mission, 52.6 crore Jan Dhan accounts have been opened, 3.47 crore pucca houses have been built for the poor people under the PM-AWAS Yojana, 11.7 crore households provided tap water connections under Jal Jeevan Mission, and 6.9 crore hospital admissions have been made under the Ayushman Bharat Scheme. Behind these numbers lie numerous stories of better lives.

7.6 India's social and economic milieu presents many strengths, opportunities, and challenges. Its strengths can be counted as the fastest-growing economy, which is making great strides in delivering welfare and opportunities to its people through the creation and expansion of digital public infrastructure (DPI). The opportunities are reflected in the fact that 18 per cent of the population is in the age group of 15-24 years (compared to the global average of 15.4 per cent), with a median age of 28.2 years.⁵ This young India wants to climb the ladder of social and financial progress faster. These strengths and opportunities are also counter-balanced by significant challenges, including improving learning outcomes in schools, eliminating malnutrition, channelising the potential of the hinterland, tackling regional, caste and gender disparities, and instilling accountability and transparency at all levels of the Government. In light of limited fiscal resources, the expectations of the socio-economically diverse populace necessitate a sensitive, pragmatic, and prudent welfare policy.

7.7 This required transforming the approach to a long-term-oriented, efficient, and empowering one, recognising universal access to basic amenities as a starter for inclusive growth, thus impelling an array of flagship initiatives. In contrast to short-term measures requiring repeated disbursement of scarce resources, such an approach not only builds social infrastructure for the decades to come but also enables individuals to climb up the standard-of-living ladder and utilise the opportunities accompanying high growth. Socially empowering the citizens inculcates a sense of autonomy and self-confidence by altering social relationships, institutions, and discourses so that the hitherto excluded disadvantaged sections of society can also find a place in the sun. Placing people on the 'development' treadmill from the 'welfare' treadmill is not just a matter of fiscal sustainability. Self-esteem and personal dignity also stand enhanced when members of the public participate in and contribute to development, moving away from welfare dependence. As Rama Bijapurkar notes, even among the socially disadvantaged, "there is a distinct and growing segment who, with some combination of access to networks, information, Government support, and personal circumstances, find the agency and energy to try and strive for opportunities for a better life."⁶

Pillars of the new approach to welfare

7.8 The new welfare approach bears in mind that spending alone cannot guarantee outcomes. It lays a strong focus on transforming the implementation and effectiveness of Government programmes, thus increasing the impact per rupee spent. Cost-effectiveness is increasingly

⁵ United Nations, World Population Prospects (2022), <https://ourworldindata.org/grapher/population-by-age-group>

⁶ 'The new tale of two Indias', Business Standard, 25 June 2024 <https://tinyurl.com/35p9ukf8>

being pointed out in academic literature, too. For instance, Muralidharan (2024)⁷ estimates that unless the efficiency of converting spending into outcomes is substantially improved, neither a growth focus nor a development focus (i.e., increasing budget allocation to social sectors) will lead to satisfactory outcomes in tackling child stunting, improving learning in schools, reducing the infant mortality rate. To this end, the Government is emphasising process reforms and accountability, interwoven with the utilisation of technology.

7.9 The digitisation of healthcare, education and governance has been a force multiplier for every rupee spent on a welfare programme. The Direct Benefit Transfer (DBT) scheme and Jan Dhan Yojana-Aadhaar-Mobile (JAM) trinity have been boosters of fiscal efficiency and minimisation of leakages, with more than ₹38 lakh crore having been transferred via DBT since its inception in 2013.⁸

7.10 The Government has also implemented a goal-oriented approach for budgetary allocation, comprising expected outputs and outcomes of the schemes, as part of the Outcome Budget, which has been accompanying the conventional annual Budget since FY 18. An ‘Output-Outcome Monitoring Framework’ has been developed by NITI Aayog for the major central sector and centrally sponsored schemes since FY 20. Moreover, acceleration in capital expenditure within social services expenditure signifies higher productivity and creation of societal assets. This is set against the backdrop of ubiquitous, user-friendly dashboards and management information systems (MIS) across major schemes, instilling transparency and accountability through real-time monitoring. Box VII.1 delves deeper into the rising heft of data in governance.

Box VII.1: Transforming data governance in India: DGQI 2.0 and beyond

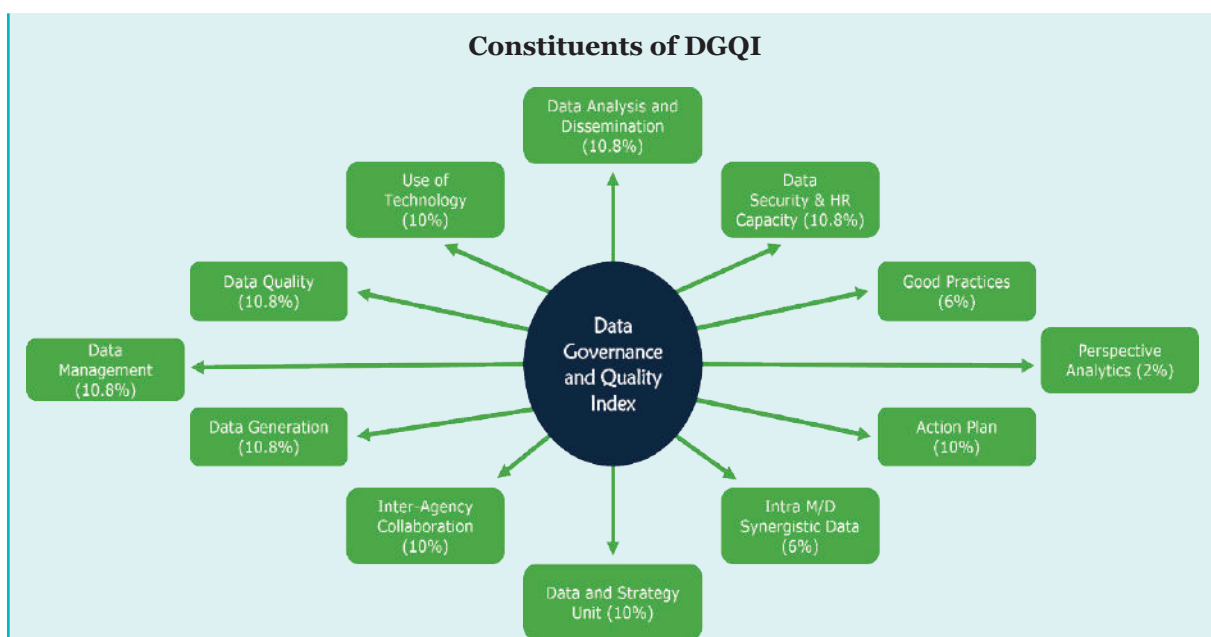
Over the past few decades, the Government of India has made significant strides in managing and utilising data effectively. Recent decades have witnessed a digital transformation, with MIS and centralised data access through policies like the National Data Sharing & Accessibility Policy and data.gov.in. Dashboard systems and platforms like District Development Coordination and Monitoring Committees (DISHA), Prayas, and Output Outcome Monitoring Framework have improved accountability in public policy.

Today, most Government programmes utilise internal MIS that capture vast amounts of data. In today’s digital age, effectively managing this data, extracting actionable insights for decision-making, facilitating course corrections, and ensuring interoperability across Government data units are critical objectives of India’s data strategy towards a *Viksit Bharat*. It would bolster data availability for decision-making and foster system interoperability for a seamless experience for beneficiaries accessing Government services.

In this context, a comprehensive review of present data preparedness levels of all Ministries/ Departments (M/D) was required to chart the way forward and suggest measures for improvement. Against this background, the Data Governance Quality Index (DGQI) exercise was initiated to assess the data preparedness of various M/D on a standardised framework to drive healthy competition among them and promote cooperative peer learning from best practices.

7 Muralidharan, K. (2024): “Accelerating India’s Development: A state-led roadmap for effective governance”, Penguin India Viking, ISBN: 9780670095940, Chapter 10.

8 As of 15 July 2024, source: <https://dbtbharat.gov.in/>



Source: NITI Aayog

The exercise is conducted periodically, where the Ministries are requested to fill out responses to a standard questionnaire on the DGQI dashboard. The exercise culminates in a report that includes rankings of all M/Ds and their schemes, providing analytical insights for further improvement and learning. The index has progressed from an average score⁹ of 2.29/5 in the 1st Round in 2020 to 3.95/5 in the latest Round, i.e., Round 6 in 2024, comprising around 75 M/Ds and 567 interventions/schemes.

It is hoped that in the long run, DGQI will help in laying the foundation of robust data monitoring system of all the CS/ CSS schemes of all M/Ds, ultimately leading to a state-of-the-art data-driven decision making.

7.11 The approach also comprises targeted implementation reforms for last-mile service delivery to truly realise the maxim of “no person left behind.” The Aspirational Districts Programme (ADP), following the 3C approach of ‘Convergence’ across levels of Government, ‘Collaboration’ between civil society and Government, and ‘Competition’ among states and districts through a dashboard monitoring monthly progress led to substantial improvement in several indicators such as health and nutrition, education, and reporting saturation in the basic infrastructure such as electricity connections, all-weather roads, basic sanitation facilities, etc. An appraisal of the programme by the United Nations Development Programme (UNDP) concluded that the programme has resulted in sectoral growth and improvements in governance and administration.¹⁰ Box VII.2 presents two success stories of the ADP. Other targeted programmes include the Aspirational Blocks Programme, launched in 2023, the Vibrant Villages Programme for border areas, and more recently, the Viksit Bharat Sankalp Yatra, which saw participation of 15 crore people in two months starting 15 November 2023, are other examples of going the extra mile for saturation of various Government schemes.

⁹ Based on the constituents’ weightage, the DGQI score lies between 0 (lowest) to 5 (highest).

¹⁰ Aspirational Districts Programme: An Appraisal, UNDP, December 2020, available at <https://www.niti.gov.in/sites/default/files/2023-03/Aspirational-Districts-Programme-An-Appraisal.pdf> accessed on 18 June 2024

Box VII.2: Baramulla and Gumla progress from ‘Aspiration’ to ‘Transformation’

Baramulla, Jammu and Kashmir and Gumla, Jharkhand, won the prestigious PM Awards for excellence in Public Administration 2022 under the ADP category. The initiatives in Gumla and Baramulla showcase the transformative impact of targeted interventions under the ADP, significantly improving health and education outcomes.

Baramulla addressed its challenging topography and harsh weather by establishing birth waiting wards in Uri and Boniyar, benefiting 20,000 pregnant women. Severe acute malnutrition and moderate acute malnutrition rates declined to near-zero levels through monitoring with Poshan tracker tabs. Educational initiatives included 18 lab schools focusing on innovative teaching techniques and improving learning outcomes. Hybrid learning and ICT tools prepared students for competitive exams. Other efforts included crop diversification, mushroom cultivation, organic farming, and dairy units. Governance measures involved digital gap analysis, biometric attendance, and an Innovation Cell for academics.

Gumla tackled anaemia and malnutrition by promoting the cultivation of Ragi, empowering women in Self-Help Groups (SHGs) through livelihood opportunities. This initiative addressed the district’s challenges of low income, poor productivity, and lack of critical infrastructure. Tribal women handled Ragi’s procurement, processing, packaging, and marketing. Governance initiatives included an open-door policy for public grievances, regular meetings, and optimal fund allocation. The innovative Ragi Mission broke the stagnant monocropping practice by expanding the ragi cultivated area by 3500 acres, resulting in a 219 per cent increase in production in FY22. Solar-based lift and drip irrigation systems covering more than 4349 acres ensure all-year round agricultural practice in the region.

7.12 This transformed approach to welfare further encompassed prioritising social enablers. Accordingly, stress was placed on investments in health and sanitation. For example, child immunisation under Mission Indradhanush and sanitation through programmes like ODF and ODF plus and Swachh Bharat Mission have led to lesser disease incidence due to cleaner practices, lesser school absenteeism due to illness, and more effective nutrient absorption over the long run among the least privileged. According to the fifth National Family Health Survey (NFHS-5), the percentage of children aged 12-23 months who are fully vaccinated increased from 77.9 per cent in 2015-16 to 83.8 per cent during 2019-21.

7.13 Another policy of the Government, given the country’s demography and occupation profile, has been to provide affordable social security schemes for the unorganised sector workers. The Atal Pension Yojana (APY), PM Jeevan Jyoti Yojana (PMJJY), and PM Suraksha Bima Yojana (PMSBY) (all three launched in 2015) are success stories of an expanding social safety net equipped with universal bank account penetration. While PM-JJY and PM-SBY were the first of their kind, the APY improved remarkably upon its predecessor, the Swavalamban Yojana.

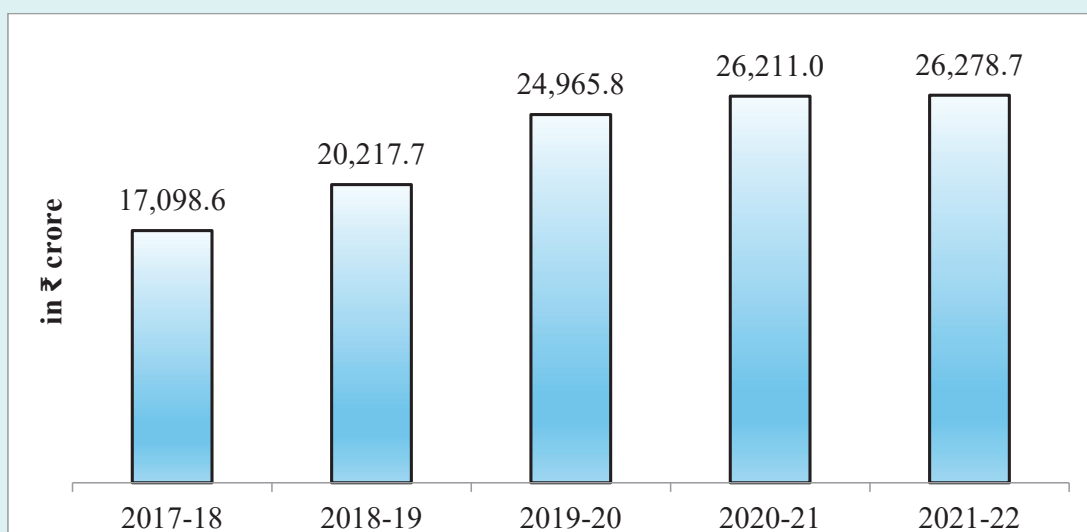
7.14 The approach to welfare is wholesome and whole-of-society, with increasing private sector participation through Corporate Social Responsibility (CSR). In 2014, spending by companies on social purpose programmes was made mandatory through a new provision under Section 135 of the Companies Act 2013.¹¹ The trend of CSR spending post-2014 is presented in Box VII.3. With the robust growth of the economy, corporate profits in India and, hence, the mandatory CSR pool will continue to grow, powering the sustainable and inclusive development that non-profits are uniquely positioned to accelerate with their last-mile presence on the ground.

Box VII.3: Corporate Social Responsibility – Building bridges between profit and purpose

Some trends in the extent of CSR activities as per the Ministry of Corporate Affairs (MCA)'s data are presented below.

- (a) In the eight years from 2014 to 2022, ₹1.53 lakh crore were spent on CSR, and the spending across the last three years constitutes more than 50 per cent of the total CSR amount spent since 2014. CSR compliance has seen a growing adherence over the years, with more than half the companies even going beyond their obligation. For the last three years, yearly CSR spending has been more than ₹25 thousand crore, with yearly CSR spending increasing by 1.5 times in eight years.¹²

Chart VII.1(a): Annual CSR spending in India (in ₹ crore)



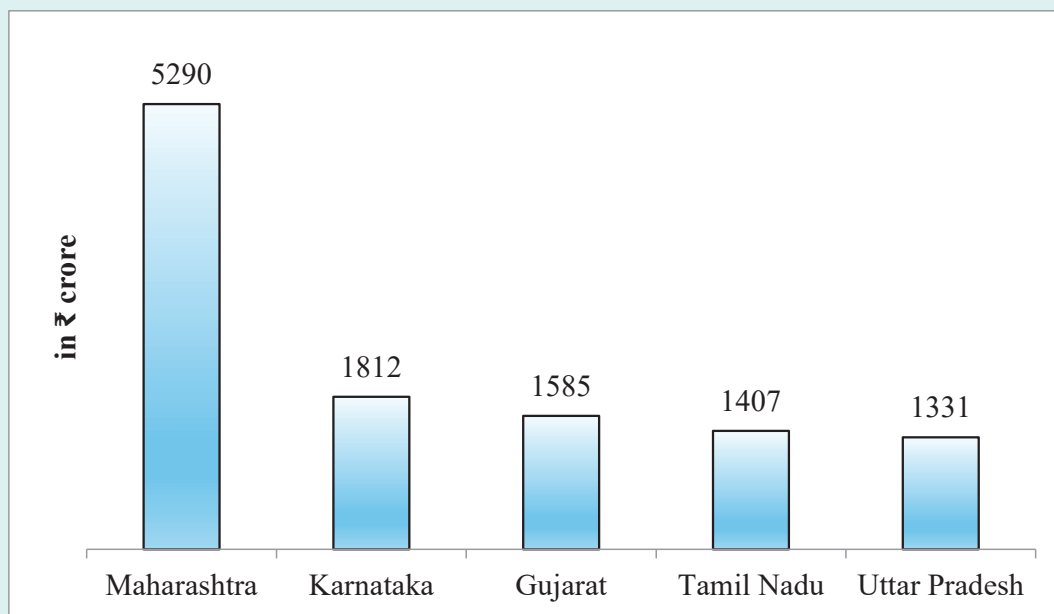
Source: Ministry of Corporate Affairs web portal <https://www.mca.gov.in/content/csr/global/master/home/home.html>

¹¹ The legal mandate on CSR applies to companies that have a net worth of ₹500 crore or more, or annual turnover of ₹1000 crore or more, or net profit of ₹5 crore or more. Companies coming under CSR mandate are required to spend 2 per cent of their average net profit of the preceding three financial years on social impact Programmes that focus on any of the causes listed in the Schedule VII of the Companies Act, 2013.

¹² Source: India Data Insights, Sattva Consulting <https://indiadatainsights.com/theme/csr-in-india/>

State-wise CSR spent is presented in Chart below.

Chart VII.1(b): Total CSR spent: Top five States, FY22



Source: Ministry of Corporate Affairs web portal <https://www.mca.gov.in/content/csr/global/master/home/home.html>

- (b) Public sector units, while constituting about 2 per cent of the companies under CSR mandate, contribute to almost 17 per cent of the total CSR amount.
- (c) Sector-wise, more than three-fourths of total CSR spend is in the top four development sectors, i.e., Education (32.4 per cent), Healthcare & Sanitation (38.4 per cent), Rural Development (6.9 per cent), and Environment, Animal Welfare & Conservation (10.9 per cent).
- (d) About half of the implementation of CSR funds happens in partnership with non-profit organisations. This implementation model adopted by companies has provided an excellent boost to the non-profit ecosystem in the country besides enabling cross-pollination of ideas across sectors. While non-profits learn analytical and process-based rigour from partner companies, the latter have benefitted from community engagement and inclusive outlook as the corporate citizens of the society.
- (e) The distribution of CSR investment is primarily centred around the hubs of corporate headquarters in the country, while underdeveloped areas remain relatively less funded. For regionally-balanced CSR spending, there is a need for enhanced investment in the organisational growth and capacity building of the non-profit organisations working in underdeveloped areas.

Overall Progress and Outcomes

Improvements in multidimensional poverty

7.15 Focusing solely on income is not enough to capture the actual reality of poverty, as it may conceal the exact deprivations experienced by millions of individuals every day. Here, the measurement of multidimensional poverty is valuable to gauge the incidence and intensity of poverty as it is lived by revealing who is poor and the different disadvantages they experience.

7.16 The National Multidimensional Poverty Index (MPI) has been estimated for India by NITI Aayog, which is in line with the global MPI¹³ published by the UNDP, with a few customisations for the Indian context.¹⁴ The MPI estimated by the Niti Ayog has three equally weighted dimensions: health, education, and standard of living, split across 12 weighted indicators. These deprivations are very basic and, hence, emblematic of real poverty, in addition to informing policymakers of the necessities lacking in the country.¹⁵

7.17 While the headcount ratio measures the spread of multidimensional poverty, the deprivation score measures the intensity of multidimensional poverty (i.e., the number of deprivations experienced by a poor person). A weighted deprivation score of 0.33 is required for a household to qualify as MPI-poor. The MPI index is thus obtained as the product of headcount ratio (HCR) and intensity.

India's Progress in MPI: 2019-21 vs. 2015-16

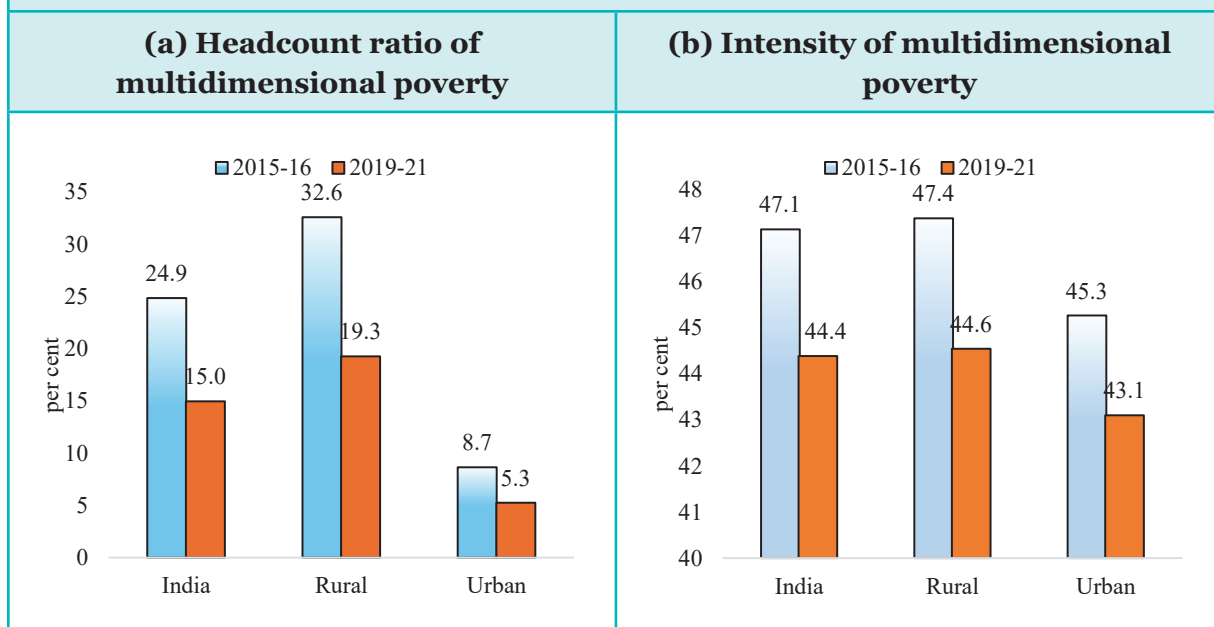
7.18 There has been a sharp decline in the HCR accompanied by a decrease in the intensity of poverty, with the MPI nearly halving from 0.117 in 2015-16 to 0.066 in 2019-21, thereby setting India on the path of achieving the SDG Target 1.2 (of reducing multidimensional poverty by at least half) much ahead of the stipulated timeline of 2030. Resultantly, 13.5 crore Indians are estimated to have escaped multidimensional poverty between 2015-16 and 2019-21. This decline is driven by declining deprivations in nutrition, years of schooling, sanitation, and cooking fuel, attributable to large-scale policy attention. Region-wise, this trend is driven by rural India, with the most significant improvements occurring in states like Bihar, MP, UP, Odisha, and Rajasthan. Uttar Pradesh registered the most significant decline in the number of poor people, with 3.43 crore people escaping multidimensional poverty. Notably, the number of States with less than 10 per cent of people living in multidimensional poverty doubled from 7 in 2016 to 14 in 2021.

13 <https://hdr.undp.org/content/2023-global-multidimensional-poverty-index-mpi#/indicies/MPI>

14 <https://www.niti.gov.in/index.php/whats-new/national-multidimensional-poverty-index-2023>

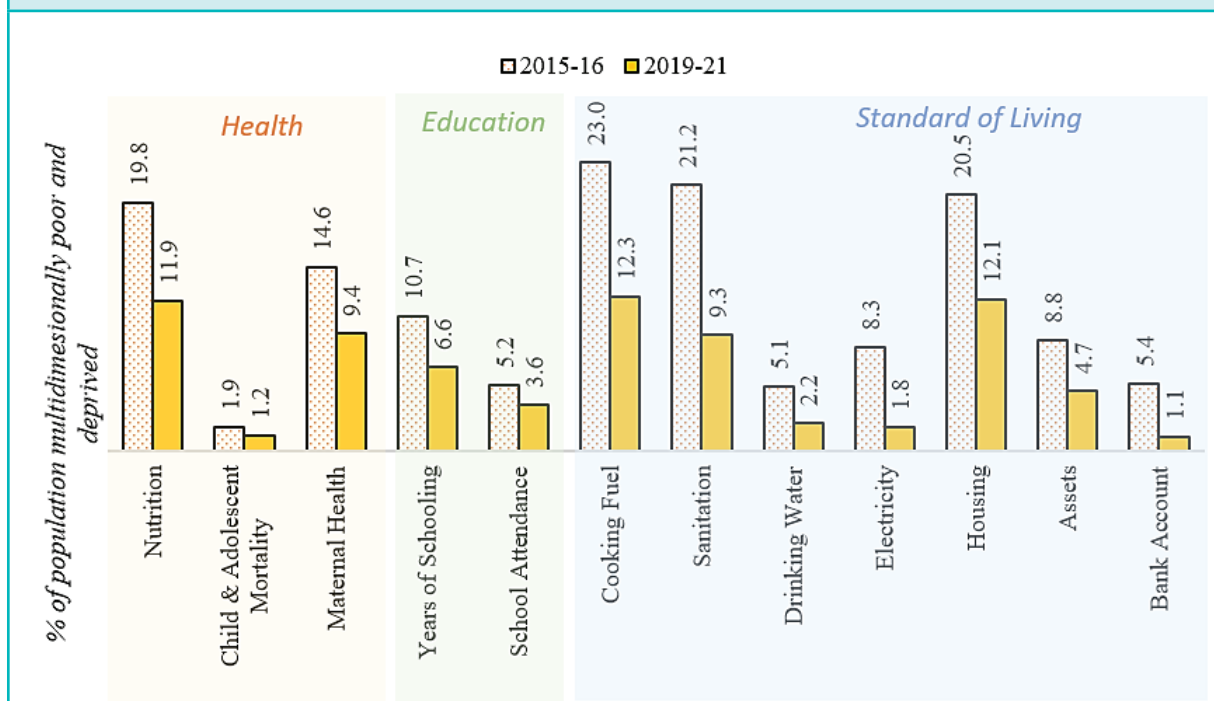
15 The Alkire-Foster methodology has been adopted to develop this index. It has many axiomatic advantages such as monotonicity, scale and replication invariance, symmetry, poverty, and deprivation focus, etc., making it a globally accepted methodology. This is largely same as Global MPI by UNDP & OPHI, with 2 additional indicators, i.e., maternal health and bank account, using the data from the NFHS.

Chart VII.2: Decline in multidimensional poverty



Source: NITI Aayog, MPI Report 2023

Chart VII.3: Decline in the deprivations across the multidimensionally poor population



Source: NITI Aayog MPI Report 2023

7.19 NITI Aayog's discussion paper, 'Multidimensional Poverty in India since 2005-06',¹⁶ finds that 24.82 crore people have escaped multidimensional poverty between 2013-14 and 2022-23. To assess the poverty levels in 2013-14 and 2022-23, projected estimates based on the compounded annual rate of change have been used due to data limitations for these specific periods. According to the NITI's paper, India has registered a significant decline in the proportion of individuals in multidimensional poverty in India from 29.17 per cent in 2013-14 to 11.28 per cent in 2022-23, i.e. a reduction of 17.89 percentage points.

7.20 The paper also highlights that UP registered the largest decline in the number of poor, with 5.94 crore people escaping multidimensional poverty during the last nine years, followed by Bihar at 3.77 crore, MP at 2.30 crore and Rajasthan at 1.87 crore. Overall, the decline in poverty HCR was much faster between 2015-16 and 2019-21 (10.66 per cent annual rate of decrease) than from 2005-06 to 2015-16 (7.69 per cent annual rate of decline).

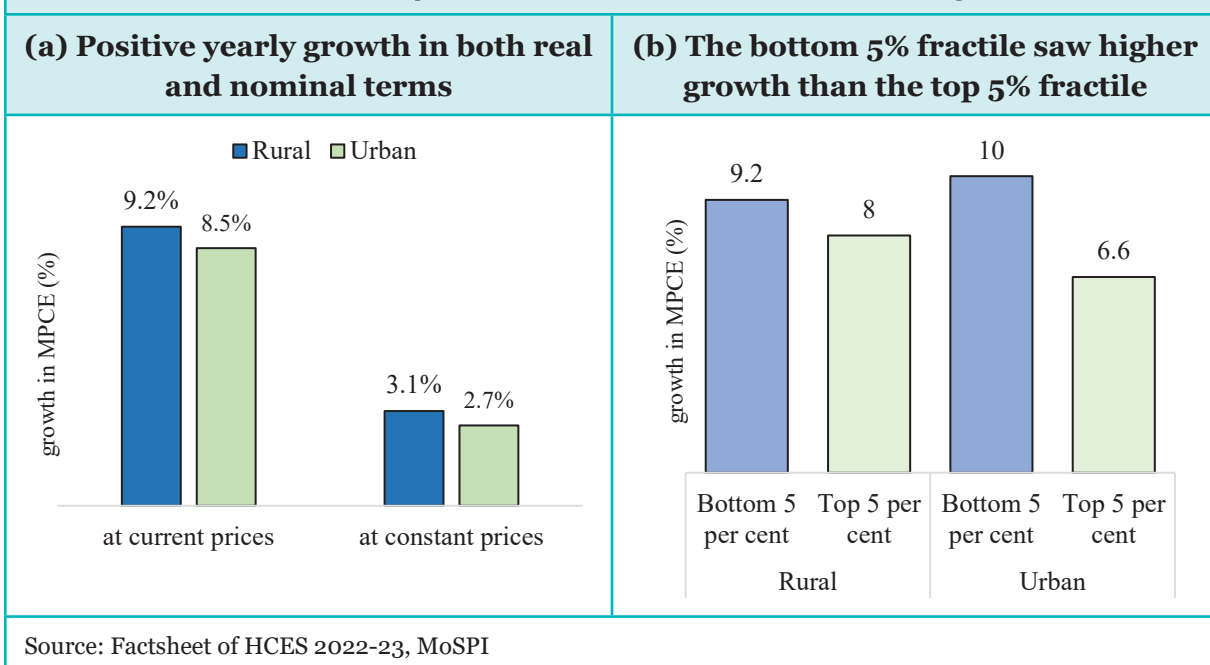
Household Consumption Expenditure Survey 2022-23

7.21 The results of various initiatives in the social sector have translated into reduced inequality and rising consumption spending, as evident from the results of the latest Household Consumption Expenditure Survey (HCES) 2022-23 (conducted from August 2022 to July 2023), released on 24 February 2024.¹⁷ The results provide insights into the monetary aspect of living standards across rural and urban areas, estimated as the monthly per capita consumption expenditure (MPCE). The results broadly confirm the substantial rise in non-income aspects of living standards noted previously in the multidimensional poverty report of the NITI Aayog.

7.22 The HCES offers many reassuring findings on inclusive growth in the past decade. The MPCE in 2022-23 increased in real terms by 40 per cent in rural and 33.5 per cent in urban areas over 2011-12. The Gini coefficient, an indicator of inequality, has declined from 0.283 to 0.266 for the rural sector and from 0.363 to 0.314 for the urban sector of the country. The rural-urban divide has also declined considerably, as the difference between rural and urban MPCE declined from 83.9 per cent in 2011-12 to 71.2 per cent in 2022-23. Within rural and urban areas, the consumption of the lowest 5 per cent of the MPCE population grew faster than the top 5 per cent, indicating a decline in economic inequality over the last decade. Imputation of free-of-cost items provided through various Government programmes leads to a further progressive rise in MPCE, with the benefit of welfare schemes as a proportion of MPCE at 0.8 per cent for the top 5 per cent fractile and 5.0 per cent for the bottom 5 per cent fractile in rural areas (for urban areas, the corresponding figures were 0.1 per cent and 4.3 per cent respectively). Juxtaposing the MPCE numbers with the per capita gross national income (PCI) reveals an inclusive trend in economic growth, where the MPCE/PCI ratio has increased for all consumption classes except the top 5 per cent in rural India and the top 10 per cent in urban India. Notably, this progress occurred despite the once-in-a-century crisis of the COVID-19 pandemic.

¹⁶ <https://tinyurl.com/f48k757c>.

¹⁷ <https://tinyurl.com/t8s5unut>

Chart VII.4: CAGR in MPCE: 2011-12 to 2022-23

Quality Healthcare for All

7.23 For a resilient economy, the health sector is vital. A sound healthcare system is interconnected with long-term factors responsible for inclusive growth, such as ensuring the quality of human capital and labour productivity, higher household savings, avoiding the poverty trap due to catastrophic health expenditure, and building the capability to withstand any health shocks such as COVID-19. In that spirit, the Indian health system has been consistently revamped.

7.24 The Government is committed to ensuring sound health and well-being of all ages through a preventive and promotive healthcare orientation in all developmental policies and universal access to good quality healthcare services. To this end, the Government is implementing various schemes and programmes. Key initiatives and their progress are listed in Table VII.2.

Table VII.2: Key Healthcare Schemes

Programme/Purpose (year of launch)	Progress/Outcome
<p>Ayushman Bharat Pradhan Mantri Jan Aarogya Yojana (AB-PMJAY) (2018)</p> <p><i>Health insurance cover of ₹5 lakh/year for underprivileged families for secondary and tertiary hospitalisation</i></p>	<ul style="list-style-type: none"> • 34.73 crore Ayushman Bharat cards generated • 7.37 crore hospital admissions have been covered by the scheme. • 49 per cent of beneficiaries are females (as of 8 July, 2024)¹⁸

¹⁸ <https://dashboard.pmjay.gov.in/pmj/#/>

Programme/Purpose (year of launch)	Progress/Outcome
<p>PM Jan Aushadhi Kendras <i>Quality medicines at 50-90 per cent cheaper than market rates</i></p>	<ul style="list-style-type: none"> • 10,000th Jan Aushadhi Kendra was inaugurated in AIIMS Deoghar. • 1965 medicines & 293 surgical equipments available
<p>AMRIT (Affordable Medicines and Reliable Implants for Treatment) <i>Subsidised medicines for critical illnesses</i></p>	<p>More than 300 Amrit pharmacies operating in different States/UTs</p>
<p>Ayushman Bhav Campaign (Sep 2023) <i>To saturate selected healthcare services in every village/town and inform citizens about the Government's flagship schemes.</i></p>	<ul style="list-style-type: none"> • 16.96 lakh wellness, yoga, and meditation sessions, 1.89 crore Tele consultations, free drugs availed by 11.64 crore people and free diagnostics services availed by 9.28 crore people • ANC¹⁹ Checkup and Immunization availed by 82.10 lakh mothers and 90.15 lakh children • Seven types of screening (TB, Hypertension, diabetes, Oral Cancer, Breast Cancer, Cervical Cancer and Cataract) are availed by 34.39 crore people. • 2.0 crore patients consulted general OPD, while 90.69 lakh patients consulted specialist OPD, and 65,094 major surgeries and 1,96,156 minor surgeries were conducted. • 13.48 crore ABHA accounts were created, 9.50 crore Ayushman cards were generated, and 1.20 lakh Ayushman Sabhas were organised. • The cumulative footfall reached 20.66 crore in 25.25 lakh health melas (as of 31 March 2024)
<p>Ayushman Bharat Digital Mission (ABDM) (2021) <i>to create a national digital health ecosystem across the country</i></p>	<ul style="list-style-type: none"> • 64.86 crore Ayushman Bharat Health Accounts (ABHA) created • 3.06 lakh Health Facility Registries • 4.06 lakh Healthcare professionals • 39.77 crore Health records linked with ABHA²⁰

19 Absolute Neutrophil Count

20 Source: Ministry of Health and Family Welfare inputs

Programme/Purpose (year of launch)	Progress/Outcome
eSanjeevani (2019) <i>Telemedicine for virtual doctor consultations in remote areas</i>	<ul style="list-style-type: none"> 26.62 crore patients served across 128 specialities at 1.25 lakh Health & Wellness Centres (as Spokes) through 15,857 hubs.²¹ (as of 9 July 2024)

Minding the Mind: Taking stock of the mental health scenario

7.25 Mental health is a less seen yet principally impactful driver of individual and national development. Way back in 1954, Dr. Brock Chisholm, the first Director-General of the World Health Organization (WHO), famously said, “Without mental health, there can be no true physical health.”

7.26 Mental well-being is intertwined with all aspects of health, viz. physical, social, and emotional, and can be described as a state of well-being in which a person is able to cope with the stresses of daily life, continue to be productive and contribute to the community. Mental health conditions include mental disorders and psychosocial disabilities, as well as mental states associated with significant distress, impairment in functioning or risk of self-harm. From minor stressors to severe disorders, mental health concerns can have an impact throughout an individual’s lifetime.

Rising prevalence of mental health issues

7.27 As per WHO, in 2019²², one in every eight people, or 970 million people globally, were living with a mental disorder²³, with anxiety and depression being the most common conditions. The COVID-19 pandemic led to a 27.6 per cent increase in cases of major depressive disorders and a 25.6 per cent increase in cases of anxiety disorders in 2020 globally.²⁴ According to a large-scale study co-led by researchers from Harvard Medical School and the University of Queensland, one out of every two people in the world will develop a mental health disorder in their lifetime (McGrath et al., 2023).²⁵

7.28 In the Indian context, the National Mental Health Survey (NMHS) 2015-16²⁶ showed that 10.6 per cent adults suffered from mental disorders in India while treatment gap for mental disorders ranged between 70 to 92 per cent for different disorders. Further, as per the survey, the prevalence of mental morbidity was higher in urban metro regions (13.5 per cent) as compared

21 <https://esanjeevani.mohfw.gov.in/#/>

22 According to the World Health Organisation (WHO), https://www.who.int/health-topics/mental-health#tab=tab_1.

23 According to WHO, a mental disorder is characterized by a clinically significant disturbance in an individual’s cognition, emotional regulation, or behaviour.

24 COVID-19 Mental Disorders Collaborators. Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic. *Lancet*. 2021 Nov 6;398(10312):1700-1712.

25 McGrath, J. et al. (2023): “Age of onset and cumulative risk of mental disorders: a cross-national analysis of population surveys data based on 156,331 respondents from 29 countries from 29 countries”, *The Lancet Psychiatry*, Volume 10, Issue 9, Pages 668-681, ISSN 2215-0366

26 National Mental Health Survey of India, 2015-16: Mental Health Systems. Bengaluru, National Institute of Mental Health and Neuro Sciences, NIMHANS Publication No. 130, 2016.

to rural areas (6.9 per cent) and urban non-metro areas (4.3 per cent). The second and more expansive NMHS is currently in progress. According to Dhyani et al. (2022), individuals aged 25-44 years are the most affected by mental illnesses.²⁷

Evolving Mental Health of Children and Youth

7.29 Sound mental health of children and adolescents is the foundation of their holistic development and a critical step towards ensuring quality economic growth. This assumes urgency in the wake of rising prevalence of mental health issues in youth, attributable to academic pressures, social media, family dynamics, and socio-economic environment. Globally, one in seven 10-19-year-olds experience a mental disorder (WHO 2021).²⁸ According to research carried out by Gallup for UNICEF's Changing Childhood report, a median of 19 per cent of 15 to 24-year-olds in 21 countries self-reported in the first half of 2021 that they often feel depressed or have little interest in doing things.²⁹

7.30 In India, NCERT's Mental Health and Well-being of School Students Survey³⁰ showed an increasing prevalence of poor mental health among adolescents, exacerbated by the COVID-19 pandemic, with 11 per cent of students reported as feeling anxious, 14 per cent as feeling extreme emotion and 43 per cent experienced mood swings. 50 per cent of students cited studies as a reason for anxiety, and 31 per cent cited examination and results.

7.31 The increase in mental health issues in children and adolescents is often linked to the overuse of the internet and, specifically, social media. Unrestrained and unsupervised use of the internet by children can culminate into a range of problems, from the more prevalent obsessive consumption of social media or "doom scrolling"³¹ to severe ones such as cyberbullying.³² Jonathan Haidt, a famous American social psychologist and author, explores the impact of increased screen time and reduced free play on mental health issues among young people in his book 'The Anxious Generation: How the great rewiring of children is causing an epidemic of mental illness'. Discussing the impact of social media, overprotective parenting, and the decline of unsupervised outdoor play on children's emotional well-being, the book suggests that the epidemic of mental health issues hit the world in the early 2010s with the advent of mobile phones. This 'great rewiring of childhood' has interfered with children's social and neurological development, covering everything from sleep deprivation to attention fragmentation, addiction, loneliness, social contagion, social comparison, and perfectionism.

27 Dhyani A, Gaidhane A, Choudhari SG, Dave S, Choudhary S. (2022): "Strengthening Response Toward Promoting Mental Health in India: A Narrative Review". *Cureus*. 2022 Oct 18;14(10):e30435.

28 WHO, November 2021, Mental health of adolescents <https://tinyurl.com/37s3s5ku>

29 UNICEF (2021), The Changing Childhood Project, UNICEF, New York.

30 NCERT (2022), Mental Health and Well-being of School Students– A Survey, Available at: [Mental_Health_WSS_A_Survey_new.pdf](https://www.ncert.nic.in/WSS_A_Survey_new.pdf) (ncert.nic.in). The survey was conducted covering students across gender, grades VI–VIII (middle stage) and IX–XII (secondary stage) and schools across the country. A total of 3,79,013 students participated in the survey between January to March 2022 from 28 States and 8 UTs of the country.

31 Olivine, A. (2023, June 27). *Doomscrolling: Definition, Effects, Mental Health Support*. Verywell Health. <https://www.verywellhealth.com/doomscrolling-7503386>

32 Cyberbullying is considered to be a serious public health issue, closely related to an adolescent's mental health and development. Those bullied online show severe symptoms of depression, anxiety and loneliness. Self-esteem issues and absenteeism from school. See Zhu, C., Huang, S., Evans, R., & Zhang, W. (2021). Cyberbullying Among Adolescents and Children: A Comprehensive Review of the Global Situation, Risk Factors, and Preventive Measures. *Frontiers in Public Health*, 9(1).

7.32 Vivek Murthy, the U.S. Surgeon General, talks about social media being akin to tobacco and suggests warning labels on the tech platforms, arguing that they are fuelling a mental health crisis among teenagers. He goes on to make a case for laws to shield the young from online harassment, abuse, and exploitation.³³ Recently, the Los Angeles Unified School District Board of Education voted to prohibit smartphones for its 429,000 students in a bid to shield them from distractions, social media, and detrimental effects on learning and mental health.³⁴ In the Indian context, the rising usage of the Internet on mental health has been indicated by a 2021 study on ‘Effects of using Mobile Phones and other devices with Internet accessibility by children’ by the National Commission for Protection of Child Rights, according to which 23.8 per cent of children use smartphones while they are in bed, and 37.2 per cent of children experience reduced levels of concentration due to smartphone use.³⁵

Mental Health Issues through the lens of Economics

7.33 Mental health problems affect the quality of life of an individual and constrain the realisation of an individual’s potential. At an aggregate economic level, mental health disorders are associated with significant productivity losses due to absenteeism, decreased productivity, disability, increased healthcare costs, etc.³⁶ Apart from mental health impacting economic development, there is also evidence of poverty affecting the risk of mental health via stressful living conditions, financial instability, and a lack of opportunities for upward mobility, which contribute to heightened psychological distress.³⁷ Moreover, rising urbanisation and migration can disrupt social cohesion, traditional support systems, and stability, causing significant mental stress (Trivedi, Sareen, and Dhyani 2008).³⁸

7.34 Given the impact of mental health on growth, the returns on investment in the former are also high. According to a 2016 study across 36 countries, the benefit-to-cost ratio of substantially scaled-up treatment of depression and anxiety in 2016-30 was estimated as 2.3-3.0 to 1 considering economic benefits only, and 3.3-5.7 to 1 when the value of health returns is also included (Chisholm et al. 2016).³⁹ In the Indian context, Math et al. (2019) estimate the return on investment in the implementation of the Mental Health Care Act 2017 by the Government to be 6.5 times.⁴⁰

Positive policy momentum provides tailwinds for action

7.35 India is creating positive momentum in policy development by recognising mental health as a fundamental aspect of overall well-being. The Government is implementing national policies such as the National Mental Health Policy (2014), the National Youth Policy (2014) and the National Education Policy (2020), emphasising the importance of mental health across the

33 ‘Is social media the new tobacco?’, New York Times, 17th June 2024, <https://tinyurl.com/5n8y96r8>

34 Trotta, T., and O’Brien, B., 19 June 2024, “Los Angeles school board votes to ban smartphones”, Reuters <https://www.reuters.com/world/us/los-angeles-schools-consider-ban-smartphones-2024-06-18/>

35 <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1779250>

36 Goetzel RZ et al. (2018): “Mental Health in the Workplace: A Call to Action Proceedings From the Mental Health in the Workplace-Public Health Summit”, J Occup Environ Med. 2018 Apr;60(4):322-330.

37 Alegria M, et al. (2018): “Social Determinants of Mental Health: Where We Are and Where We Need to Go”, Curr Psychiatry Rep. 2018 Sep 17;20(11):95.

38 Trivedi JK, Sareen H, Dhyani M. (2008): “Rapid urbanization - Its impact on mental health: A South Asian perspective”. Indian J Psychiatry. 2008 Jul;50(3):161-5.

39 Chisholm D, et al. (2016): “Scaling-up treatment of depression and anxiety: A global return on investment analysis”. Lancet Psychiatry. 2016;3:415-24.

40 Math SB et al. (2017): “Cost estimation for the implementation of the Mental Healthcare Act 2017”, Indian J Psychiatry. 2019 Apr;61(Suppl 4):S650-S659.

entire care continuum, particularly concerning children and adolescents. Moreover, 22 mental disorders are covered under the Ayushman Bharat – PMJAY health insurance. More details on the programmes are given in the table below.

Table VII.3: Mental health programmes in India

Programme/Purpose	Progress/Outcome
<i>National Mental Health Programme⁴¹</i>	
District Mental Health Programme <i>Central funds to districts under the national health mission for integrating mental health at primary healthcare level and improving mental health infrastructure</i>	<ul style="list-style-type: none"> • More than 1.73 lakh SHCs, PHCs, UPHCs and UHWCs upgraded to Ayushman Arogya Mandirs providing mental health services • Primary health-care workers being trained to provide mental health services • Provision of 10 bedded in-patient facility at the district level • Awareness generation activities in the community, schools, workplaces, with community involvement to destigmatise mental health issues and promote treatment-seeking behaviour
National Tele Mental Health Programme <i>Universal Access to mental health counselling through Toll-free number (14416/1800-89-14416)</i>	<ul style="list-style-type: none"> • Over 1600 trained counsellors in over 20 languages • 53 Tele MANAS cells set up in 34 states/UTs • More than 8.07 lakh calls handled since Oct 2022, as of 31 March 2024
Increasing mental health personnel	<ul style="list-style-type: none"> • 25 Centres of Excellence sanctioned to increase PG students' intake • Support to 19 Government medical colleges/institutions to strengthen 47 PG Departments • Mental Health Services provisioned for 22 AIIMS • Three Digital Academies providing online training courses to general healthcare medical and para-medical professionals • Minimum Standard of Requirements for Post-Graduate Courses- 2023 issued by National Medical Council on 15.1.2024.

⁴¹ Source: Lok Sabha Starred Question no. 13 subject "National Mental Health Policy", answered on 2February 2024

Programme/Purpose	Progress/Outcome
<i>Children and youth centric Programmes⁴²</i>	
Rashtriya Kishor Swasthya Karyakram <i>Holistic development of the adolescent population</i>	Adolescent Friendly Health Clinics (AFHC), Peer education programmes providing counselling services involving parents, teachers, and community
Manodarpan <i>Counselling during COVID-19</i>	Webpage and national toll-free helpline for seeking psychological support for students
Ayushman Bharat School Health & Wellness Programme <i>Sensitising and training Health and Wellness Ambassadors (teachers)</i>	“Emotional Wellbeing and Mental Health” module developed by NCERT
Other steps	<ul style="list-style-type: none"> • NCERT counselling services for school children involving 270 counsellors across the country • Live interactive sessions SAHYOG through PM eVidya DTH channels, yoga sessions, etc. • Central Board of Secondary Education (CBSE) pre and post-examination tele-counselling through toll-free helpline. • Modular Handbook on Early Identification and Intervention for Mental Health Problems in School Going Children developed in collaboration with the Public Health Foundation of India.

7.36 In addition to national initiatives, states are implementing unique, independent initiatives at the state level. For instance, the State Mental Health Policy of Meghalaya outlines plans to train the Community Health Centre (CHC) and school staff to provide targeted support to children and adolescents. The Government of the NCT of Delhi has introduced a Happiness Curriculum for students from Nursery to Grade 8, integrating mindfulness, meditation, and values-based education into the school curriculum. Similarly, the ‘Our Responsibility to Children’ initiative launched in Kozhikode, Kerala, includes teacher, peer, and social mentoring, life skills education, and professional care and support for children with special needs within schools. These state-level initiatives complement national efforts in addressing mental health and well-being among children and adolescents.

⁴² Source: Lok Sabha unstarred Question no. 935 subject “Mental Health Services in Rural Areas”, answered on 8 December 2023

Policy Recommendations on Mental Health

7.37 While most of the policy design is in place, proper implementation can accelerate the improvement on the ground. That said, there remain certain gaps in the existing programmes which need to be addressed to maximise their effectiveness. For instance, redoubling efforts to increase the number of psychiatrists, from 0.75 psychiatrists per lakh population in 2021⁴³ to the WHO norm of 3 per lakh population (Garg, Kumar and Chandra 2019).⁴⁴

7.38 Developing comprehensive guidelines for the excellence centres' services alongside mental healthcare professionals and users would help understand their needs. Also, assessing the effectiveness of the programmes by gathering feedback from the users, professionals, and stakeholders will help make necessary changes and meet the needs of a wider population. Nurturing peer support networks, self-help groups, and community-based rehabilitation programmes can help destigmatisation of mental disorders and develop a sense of belonging. Partnering with NGOs to scale up efforts, share knowledge, and leverage resources to enhance future policies will also aid in identifying areas of improvement. Involving individuals with personal experience with mental health problems in decision-making, service planning, and advocacy efforts can increase the person-centricity and recovery orientation of mental healthcare services (Megharajani et al. 2023).⁴⁵ Sensitisation of mental health at the preschool, Anganwadi level can provide precious early identification of disorders. The rise in mental health start-ups signals a positive response from the private sector to address the care gap but also calls for standardisation of guidelines for such services.

7.39 Effective pathways for integrating mental health interventions in schools can include developing an age-appropriate mental health curriculum for teachers and students, encouraging early intervention and positive language in schools, promoting community-level interactions, and balancing the role of technology.

7.40 However, the fundamental issue of the lack of awareness about mental health and the stigma surrounding it can render any sincerely crafted programme unfeasible. Hence, there is a need to bring about a paradigm shift and utilise a bottom-up, whole-of-community approach in addressing the topic of mental health. Breaking the stigma starts with taking cognisance of the natural human tendency to accept physical ailments and seeking treatment for the same while being in denial about mental health issues. To an extent, the denial is an outcome of fear about social attitudes and social acceptance after one 'comes out' with mental health issues.

43 Source: Rajya Sabha unstarred Question no. 1015 subject "Mental Health Patients and Doctors in the country", answered on 7 December 2021.

44 Garg K, Kumar CN, Chandra PS. (2019): "Number of psychiatrists in India: Baby steps forward, but a long way to go". *Indian J Psychiatry*. 2019 Jan-Feb;61(1):104-105. doi: 10.4103/psychiatry.IndianJPsychiatry_7_18. PMID: 30745666; PMCID: PMC6341936.

45 Megharajani VR et. al. (2023): "A Comprehensive Analysis of Mental Health Problems in India and the Role of Mental Asylums". *Cureus*. 2023 Jul 27;15(7):e42559.

Nonetheless, at an individual level too, there is a reluctance to see it as normal and address it. For public health officials, tackling mental health requires acknowledging and addressing this fundamental reluctance. Arguably, mental health issues drag down productivity more widely in the ecosystem than individuals' physical health issues. Hence, paying attention to mental health issues in society is both a health and an economic imperative.

Impact manifest in health statistics

National Health Accounts show rising role of public healthcare

7.41 Over the past few years, healthcare has become more affordable and accessible for the general public, as noted by the National Health Accounts (NHA) estimates.⁴⁶ The latest NHA (for FY20) show an increase in the share of Government Health Expenditure (GHE) in the total GDP as well as the share of GHE in Total Health Expenditure (THE).

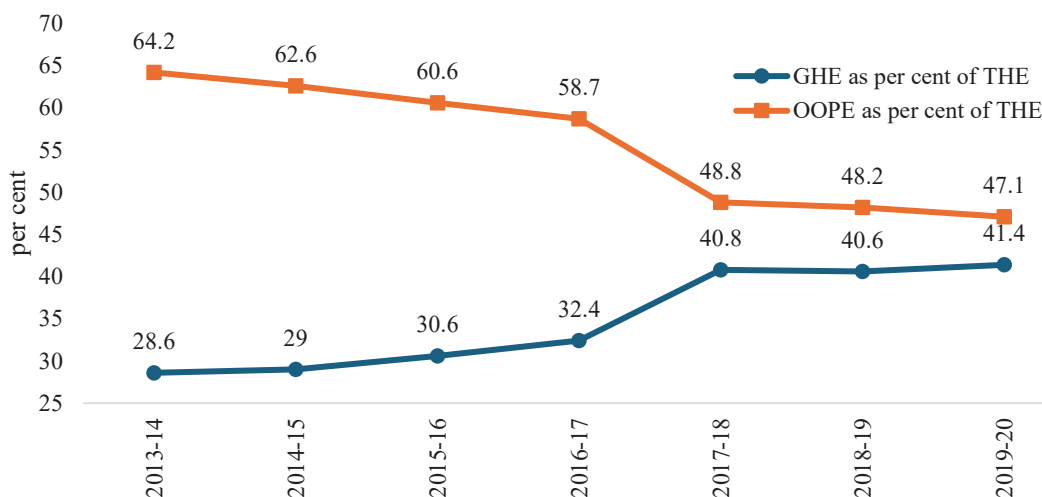
7.42 Over the years, health expenditure has tilted towards primary healthcare as a building block of the overall health ecosystem. Research has established the importance of primary health care as critical to improving health outcomes, preventing several primary and secondary disease conditions, and reducing morbidity and mortality at much lower costs, thus significantly reducing the need for secondary and tertiary care.⁴⁷ Consequently, the share of primary healthcare expenditure has increased from 51.3 per cent of GHE in FY15 to 55.9 per cent of GHE in FY20. The share of primary and secondary care in the GHE rose from 73.2 per cent in FY15 to 85.5 per cent in FY20. On the other hand, the share of primary and secondary care in private health expenditure has declined from 83.0 per cent to 73.7 per cent during the same period, attributable to rising tertiary disease burden and utilisation of Government facilities for primary healthcare.

7.43 The social security expenditure on health, which includes the social health insurance programme, Government-financed health insurance schemes, and medical reimbursements made to Government employees, has increased significantly from 5.7 per cent in FY15 to 9.3 per cent in FY20. The rising GHE and health-related social security expenditure go hand in hand with a decline in out-of-pocket expenditure (OOPE) as a percentage of THE between FY15 and FY20 (Chart VII.5(a)).

⁴⁶ NHA estimates for India 2019-20 is the seventh consecutive NHA estimates report prepared by NHSRC, designated as National Health Accounts Technical Secretariat in 2014 by the Union Health Ministry. This was released in April 2023.

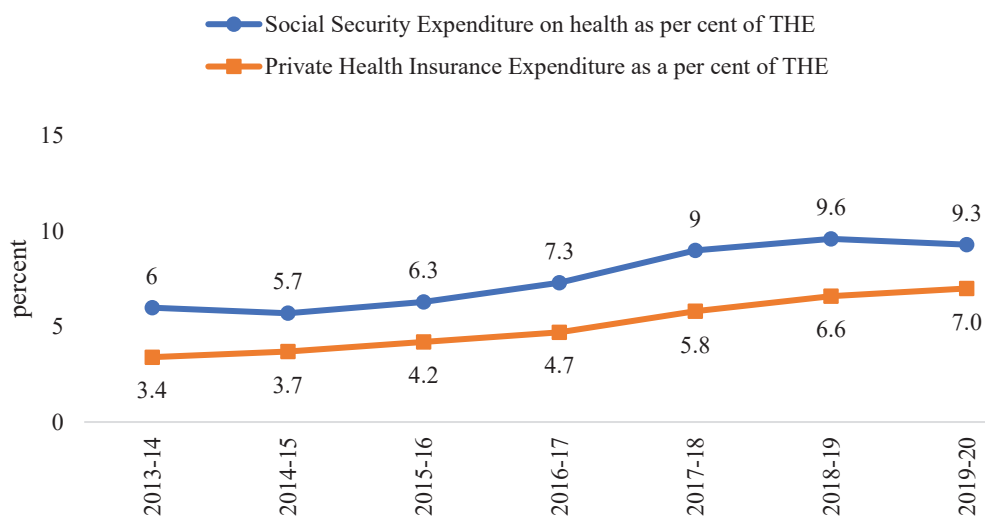
⁴⁷ See, for instance, (i) Haque, M., et.al. (2020). Strengthening Primary Health-Care Services to Help Prevent and Control Long-Term (Chronic) Non-Communicable Diseases in Low- and Middle-Income Countries. Risk Management and Healthcare Policy, 13, 409–426.(ii) Beaglehole R, et.al (2008). Improving the prevention and management of chronic disease in low-income and middle-income countries: a priority for primary health care. Lancet. Sep 13;372(9642):940-9.

Chart VII.5(a): Government Health Expenditure and Out of Pocket Expenditure as per cent of Total Health Expenditure



Source: National Health Accounts, 2019-20, MoHFW

Chart VII.5(b): Social Security Expenditure and Private Health Insurance Expenditure as per cent of Total Health Expenditure



Source: National Health Accounts, 2019-20, MoHFW

7.44 The above developments have been accompanied by improvements in key health indicators such as infant mortality rate (declining from 39 per 1000 live births in 2013 to 28 per 1000 live births in 2020) and maternal mortality rate (declining from 167 per lakh live births in 2014 to 97 per lakh live births in 2020).

7.45 As an example of lower healthcare cost burden on families, the impact of Ayushman Bharat deserves mention. According to the Health Ministry's estimates, the total cost of the treatment

would have been 1.5 - 2 times higher if the beneficiary had availed the same treatment on their own outside the ambit of AB PM-JAY. Upon incorporating this multiplier effect of low costs, the scheme corresponds to saving more than 1.25 lakh crore of OOPE for poor and deprived families (as of 12 January 2024).⁴⁸ Hence, besides shielding the populace from market vulnerabilities, Ayushman Bharat also protects the healthcare delivery system from micro-economic shocks.

7.46 Besides the direct impact on health indicators and OOPE, there exist various second-order effects of health programmes. For instance, the Ayushman Bharat has been associated with better credit market outcomes, as detailed in Box VII.4.

Box VII.4: Health insurance programmes and impact on credit market outcomes

Catastrophic, unforeseen health expenses can result in the impoverishment of individuals and families. It can force resource-poor individuals/households to forego treatment or resort to debt to undertake the treatment. Mitigating healthcare costs is anticipated to improve financial stability and loan repayment capacity.

A recent paper⁴⁹ investigates the influence of PMJAY, the world's largest publicly funded health insurance scheme, on credit market dynamics in India. Comparing border regions of states that did not implement the program with contiguous areas belonging to states that implemented the program within a difference-in-difference framework, it hypothesises that PMJAY's extensive coverage would lead to decreased financial strain due to healthcare costs, thus influencing credit behaviours like loan delinquency rates. The study employs a robust empirical strategy to isolate the effect of PMJAY from other factors. It utilises administrative data from a significant Indian credit bureau covering microfinance loan performance. The sample includes data on nearly 12 million loans across 636 districts in India.

Main findings of the study

Impact on loan performance: PMJAY implementation has been found to correlate with a significant reduction in NPA rates in microfinance loans. The study notes that the NPA rate in PMJAY-implemented districts decreased by 3.7 to 4.0 percentage points compared to non-implemented regions. This represents a 34.6 per cent to 34.1 per cent reduction relative to the average NPA rates, an economically significant impact.

Impact on small agricultural loans: A similar reduction in NPA rates was observed in eligible small agricultural loans, underscoring PMJAY's broad economic impact.

Implications for policy and financial markets

Public health programmes and economic stability: The study illuminates the broader economic impacts of public health insurance programmes. For emerging economies, where large segments of the population might lack access to health insurance, programmes like PMJAY can play a crucial role in enhancing economic stability.

⁴⁸ PIB release dated 14 January 2024, Release ID: 1996010 <https://tinyurl.com/mvpp9as6>

⁴⁹ Tantri, P L. (2022): "How Does a Health Insurance Programme Covering 500 million Poor Impact Credit Market Outcomes?", Indian School of Business WP

Healthcare policy and household finance: These findings are particularly relevant for countries considering similar health insurance schemes, highlighting the potential for such programmes to influence household financial behaviour positively.

Conclusion

PMJAY's implementation has markedly improved credit market outcomes in India, highlighting the interplay between health insurance and financial stability. This underscores the potential of public health initiatives to create significant economic benefits beyond healthcare.

7.47 Looking forward, two trends would be decisive for the health and disease profile of the country in the near future. Firstly, the Government and the public at large need to accord healthy eating and mental health the attention they deserve. For instance, as per NFHS data, 24.0 per cent of women and 22.9 per cent of men were overweight/obese in 2019-21, vis-à-vis 20.6 per cent and 18.9 per cent in 2015-16, respectively. In 50 years, the incidence of type-II diabetes has increased from less than 2 per cent in the 1970s to more than 20 per cent.⁵⁰ In cognisance of the rising obesity in India, public awareness of healthy eating is being promoted with dietary guidelines issued by the National Institute of Nutrition and the Indian Council of Medical Research. Secondly, public health being a state subject, state and local level governance remain pivotal for the national big-ticket programmes to reach the last mile through the 'path of least resistance'.

Education

7.48 'Quality Education', enlisted as Goal 4 under UN SDGs (SDG4), aims to "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" by 2030. The National Education Policy (NEP), launched in 2020 and presently in its fourth year of implementation, is a policy document that not only encompasses the SDG Goals on Education but also prepares the youth of India to take on the challenges and opportunities emerging from a knowledge-driven economy of the 21st century.

School education

7.49 The school education system in India, with public and private schools, caters to around 26 crore students from various socio-economic backgrounds. The NEP 2020 seeks to provide all learners in the age group of 3-18 years with access to high-quality education to create an educational system that is rooted in Indian culture and has the potential to establish India as a global knowledge superpower.

7.50 The NEP seeks to revamp the universe of school education to generate better learning outcomes for all. The gravity of the emphasis on learning can be felt in the various reports highlighting the gap between class standard and learning level, which has widened since COVID. For instance, in comparison to the National Achievement Survey (NAS) 2017, student

⁵⁰ Mohan, V., Sudha, V., Shobana, S., Gayathri, R., Krishnaswamy, K. (2023): "Are Unhealthy Diets Contributing to the Rapid Rise of Type 2 Diabetes in India?", *The Journal of Nutrition*, Volume 153, Issue 4, 2023, Pages 940-948, ISSN 0022-3166

performance underwent a significant drop in NAS 2021.⁵¹ Class 10 scores decreased by 13.4 per cent in Mathematics, 18.6 per cent in Science, and 9.1 per cent in Social Science, while Class 3 scores decreased by 3.9 per cent in Language, 4.7 per cent in Mathematics, and 4.4 per cent in Environmental Studies.

7.51 Implementing Early Childhood Care and Education or ECCE (refer to Box VII.5 for a notable initiative in ECCE), strengthening foundational literacy and numeracy, experiential learning, multilingual education, focusing on interdisciplinary and multidisciplinary approaches, holistic assessment, etc., are the major recommendations of the NEP 2020 to develop a new system that is in line with the inspirational goals of the 21st century.

BOX VII.5: 'Poshan Bhi Padhai Bhi': Pre-schools network anchored in Anganwadis

In alignment with the guidelines of the NEP 2020, 'Poshan bhi Padhai bhi' (PBPB) was launched in May 2023. It is a path-breaking ECCE programme to help India develop the world's largest, universal, high-quality preschool network at Anganwadi Centres. For the first time, early stimulation for 0-3 years is being covered by a Government programme.

About PBPB

Through the programme, every child would be provided with at least two hours of high-quality preschool instruction daily. All States will follow the national ECCE task force recommendations for a play-based, activity-based learning pedagogy explicitly targeted at developmental milestones of 0-3-year-olds and 3-6-year-olds, including special support for Divyang children.

Key features of PBPB

- Use of teaching-learning material, including visual aids (blackboard, posters, flashcards, activity books, etc), audio aids (radio) and audio-visual (videos, films), spatial material (drawing, painting, puzzles), etc.
- Mother tongue as primary teacher instruction medium
- Jan Andolan will involve communities in strengthening the foundations of the country's future generations.

Strengthening the country-wide-web of Anganwadis

Close to 13.9 lakh operational Anganwadi centres across the country provide supplementary nutrition, early care and education to around eight crore beneficiary children under the age of 6 years, making it the largest public provisioning of such services globally. Considering global evidence that 85 per cent of brain development is achieved by the age of 6 years, the Anganwadi eco-system becomes a critical access point for building our children's base to secure their future.

⁵¹ NAS is a central Government-led large-scale assessment that provides a 'snapshot of what students know and can do' at the end of Grades 3, 5, 8 and 10. About 34 lakh students of 1.18 lakh schools in 720 districts from both rural and urban areas participated in NAS 2021. The national, state, and district Report Cards are available at nas.gov.in.

In order to realise PBPB through Anganwadis, the latter will have to be strengthened with high-quality infrastructure, play equipment, and well-trained Anganwadi workers/teachers. In this regard, all Anganwadi Workers are to be trained on ECCE principles, including using activities, play and indigenous and DIY toys, through 40,000 Master Trainers. As of January 2024, 3735 State Level Master Trainers have been trained through 95 training programmes, covering 25 States and 182 Districts.

The potential of Anganwadis as a useful employment generation institution and for creating a stronger and productive India of the future may be enhanced.

7.52 The major schemes of the Government that are driving the NEP 2020 goals and policies into action are mentioned in Table VII.4.

Table VII.4: Government initiatives in school education

	Programme	Purpose	Progress
1.	<i>Samagra Shiksha Abhiyan</i> ⁵²		
	NISHTHA	Integrated Teacher Training Programme	Extended to cover teachers at all levels 1,26,208 Master Trainers certified in NISHTHA ECCE
	District Institutes of Education and Training (DIETs)	District-level nodal institutions guiding school education and teacher education	All 613 functional DIETs are to be upgraded into DIETs of Excellence in the next five years. In this first cycle of upgradation (FY24), an amount of ₹ 92,320.18 lakh has been approved i.r.o. 125 DIETs across the country. Based on proposals received from States, ₹ 27923.53 lakh has been released for upgradation of 23 States/UTs as first instalment in FY 24.
	Career Counselling at block level		Guidelines issued in August 2023 for the provisioning of one Academic Resource Person at each Block/ULB in the BRC for Career Counselling from FY 25.
	Vidya Pravesh	3-month play-based 'school preparation module' for all Grade-I Students with and without preschool education	Implemented by 36 States/UTs 1.13 crore students from 8.46 lakh schools covered in 2023-24

⁵² Samagra Shiksha Abhiyan was introduced in FY19 by merging the existing CSS schemes viz; Sarva Shiksha Abhiyan covering elementary education, the Rashtriya Madhyamik Shiksha Abhiyan covering secondary education and Teacher Education to treat education as a continuum from pre-school to senior secondary.

	Programme	Purpose	Progress
	Kasturba Gandhi Balika Vidyalaya (KGBV)	Residential schools for girls from disadvantaged groups such as SC, ST, OBC, Minority and Below Poverty Line	7.07 lakh girls' students are currently enrolled in 5116 KGBVs nationwide.
	Inclusive Education for Children with Special Needs (CwSN)	Accessibility of education	<p>18.50 lakh children with special needs covered from pre-primary to class XII</p> <p>Stipend @₹ 200 per month for ten months to 5.57 lakh CwSN girls</p> <p>Aids and appliances for over 3.65 lakh eligible CwSN</p> <p>Home-based education for 72,186 children with severe &/multiple disabilities</p> <p>32,196 special educators to appropriately address the learning needs of CwSN</p> <p>Teaching Learning Resources in Indian sign language, Accessibility Booklet, Tactile Map Books, Talking Books, DAISY books</p> <p>PRASHAST Pre-Assessment Holistic Screening Checklist for Schools for early screening of 21 disability conditions</p>
2.	National Assessment Centre - PARAKH	<p>The Major Objectives of PARAKH are:</p> <ol style="list-style-type: none"> Guide School Educational Boards Large Scale Achievement Surveys. Setting Standards, norms and guidelines for student assessment Build professional and institutional capacity for assessments 	<p>Policy recommendations for equivalence across school boards are being drafted after stakeholder discussions.</p> <p>State Educational Achievement Survey⁵³ conducted in November 2023, covering approximately 84 lakh learners from 4 lakh schools at 6416 blocks from 32 States & UTs.</p> <p>Development and Dissemination of "Holistic Progress Cards" for Foundational, Preparatory, and Middle Stages.</p>

⁵³ The motive of State Educational Achievement Survey is to understand learning gaps at the block level, going further deeper than the district level. While National Achievement Survey is to be carried out every three years, SEAS is to be conducted in the interim years.

	Programme	Purpose	Progress
			Workshops organised under Project Vidyasagar to familiarise teacher educators and teachers on competency based assessment as suggested in NEP 2020.
3.	Digital Infrastructure for Knowledge Sharing (DIKSHA)	National digital platform for school education, by NCERT	Free mobile application and web portal for learners, teachers, parents, etc., in 36 Indian and foreign languages 3,53,063 e-contents made available 1.71 crore registered users, 2.5 lakh daily active users
4.	Strengthening of Teaching-Learning and Results for States (STARS)	Improve the quality and governance of school education in six states (Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Odisha, and Rajasthan)	Independent Verification Agency was onboarded to verify results as per the Disbursement Linked Indicators, such as an increase in language proficiency, secondary school completion rate, governance index, etc. 6/6 targets achieved in first two years.
5.	Pradhan Mantri Schools for Rising India (PM-SHRI)	Setting up 14,500 exemplar schools showcasing NEP implementation	Three phases of school selection were completed. 10,858 schools selected from 32 States/UTs/KVS/NVS ₹5942.21 crore approved for 10,080 PM-SHRI Schools in FY25. The PAB meeting for PM SHRI Schools selected in third phase will be held soon.
6.	ULLAS-Nav Bharat Saaksharta Karyakram	Foundational Literacy and Numeracy for non-literates above 15 years of age	Online content (ULLAS Primers) created in 22 local languages through an app that redirects to the DIKSHA portal 1.33 crore learners and 35 volunteer teachers registered 77 lakh learners appeared for literacy test and more than 65 lakh have become neo-literate by passing

	Programme	Purpose	Progress
7.	PM POSHAN (POshan SHAkti Nirman) Scheme	One hot cooked meal for students of class I-VIII in Government and Government-aided schools	Benefits 11.63 crore children in 10.67 lakh schools in FY24 (till Dec 2023) 24.85 lakh cook-cum-helpers engaged, and 9.1 lakh kitchen-cum-stores constructed.
8.	National Means-cum-Merit Scholarship Scheme	Scholarships to meritorious students from economically weaker sections to arrest their drop-outs.	One lakh fresh scholarships of ₹12,000 per annum are awarded to fresh students of Class IX who clear the NMMSS exam and continue up to Class XII on the basis of eligibility criteria under the Scheme. In the year 2023-24, a total of ₹ 300.10 crore was sanctioned to 250089 students.

7.53 Besides the abovementioned initiatives to ingrain NEP 2020 in school education, an innovative programme for community, private sector, and alumnae participation in strengthening Government and Government-aided schools is delved deeper into in Box VII.6.

Box VII.6: Vidyanjali: A school volunteer programme

The Vidyanjali programme was launched on 7 September 2021 to strengthen school infrastructure and improve the quality of school education through community participation, CSR and private sector involvement across the country as envisioned in the NEP 2020. The programme offers companies/organisations/trusts, and groups an opportunity to support multiple schools of their choice by participating in projects created by States/UTs and autonomous bodies through a dedicated CSR module on the portal. This is not to substitute the Government's responsibility but to complement, supplement and strengthen Government efforts to reach the last mile in the best possible way.

Vidyanjali portal (<https://vidyanjali.education.gov.in>) acts as a facilitator by connecting volunteers - alumni of educational institutions, serving and retired teachers, scientists, Government/semi-Government officials, retired armed forces personnel, self-employed and salaried professionals, homemakers, persons from the Indian diaspora and any other organisation/group or company – directly with schools of their choice.

The Volunteers play a crucial role by bringing innovative teaching methods and interactive activities that foster creative thinking among students. Further, resourceful schools can also contribute their expertise and resources to schools that require additional support under the twinning of the school's feature under the programme.

Growth of Vidyanjali over the year (cumulative since launch in 2021)

Total number of schools onboarded	Total number of individual volunteers registered	Total CSR/ NGOs registered	Children impacted
7,47,133	4,58,511	2,881	1,44,35,995

Source: Dept. of School Education and Literacy

Impact of Vidyanjali

The Vidyanjali initiative has played a crucial role in enhancing the educational experiences of over 1.44 crore students by facilitating comprehensive community engagement and leveraging volunteer contributions across various domains, including subject assistance and mentoring and the provision of modern electronics and digital devices. This extensive volunteer involvement has enriched students' learning with diverse resources ranging from subject assistance and mentoring for gifted children to the provision of modern electronics and digital devices such as mobile phones and computers. Additionally, volunteers have supplied essential items like first aid kits and sports equipment and even transformed learning spaces with smart classrooms and upgraded kitchen gardens.

The initiative has successfully met many asset requests, with 26,268 requests completed. These requests encompass a variety of essential items and facilities crucial for enhancing the educational environment, such as basic electrical infrastructure, classroom needs, health and safety aids, etc. In addition to asset requests, the programme has completed 13,100 activities, each possibly extending over multiple days or tasks. Success stories include Delhi, which has demonstrated exemplary participation with 2883 out of 2969 schools registered, along with 14,882 active Volunteers.

Progress in school infrastructure

7.54 Basic facilities in schools continued to improve in FY 23 over earlier years. Toilets (girls or boys), drinking water, and hand-washing facilities are now available in most Government schools. Priority to drinking water and sanitation in schools under the Samagra Shiksha Scheme and the Swachh Bharat Mission have been instrumental in providing required resources and creating these school assets. Under the Information & Communication Technology (ICT) component of the Samagra Shiksha Scheme, the Government supports the establishment of smart classrooms and ICT labs in schools, including support for hardware, educational software, and e-content for teaching.

Table VII.5: Status of school infrastructure
(Schools with basic facilities as a percentage of all schools)

Year	2012-13	2019-20	2020-21	2021-22	2022-23 (P)
Girls toilet	88.1	96.9	97.3	97.5	97.0
Boys toilet	67.2	95.9	96.2	96.2	95.6
Hand wash facility	36.3	90.2	91.9	93.6	94.1
Library/Reading Room/ Reading Corner	69.2	84.1	85.6	87.3	88.3
Electricity	54.6	83.4	86.9	89.3	91.7
Medical check-ups in school in a year	61.1	82.3	50.4*	54.6*	74.3
Computer	22.2	38.5	41.3	47.5	47.7
Internet	6.2	22.3	24.5	33.9	49.7

* Due to COVID-19, schools were closed physically. Hence, fewer medical check-ups were done. P: Provisional
Source: UDISE+, <https://dashboard.udiseplus.gov.in/#/home>

National Curriculum Framework for School Education (NCF-SE) 2023

7.55 Launched in August 2023, the NCF-SE 2023 brings to life the aims and commitment of NEP 2020 by enabling its implementation. The NCF was drafted by a 12-member National Steering Committee and sought inputs from around 16 lakh diverse stakeholders, including teachers, parents, students, educational institutions, neo- and non-literates, subjects' experts, scholars, Anganwadi personnel, etc., from across the country.

7.56 The NCF-2023 improves upon its predecessor, NCF-2005, in several ways, including, inter alia, promoting competency-based education⁵⁴, introducing vocational education from grade 3 rather than grade 9, learning languages native to India, and charting a comprehensive roadmap for ECCE and Foundational Literacy and Numeracy (FLN). This is transformational as FLN is a pre-requisite for instilling value into further years of school education and hence in realising learning outcomes (Muralidharan 2024)⁵⁵. Besides, it brings more clarity, details, and direction on integrating Indigenous knowledge in the school curriculum, using education technology, including ICT, and moving away from rote memorisation.

54 Competency-based education is an approach that focuses on the development and demonstration of specific skills, knowledge, abilities, and dispositions, rather than solely relying on rote memorization.

55 Muralidharan, K., 2024. Accelerating India's Development: A state-led roadmap for effective governance. Penguin India Viking, ISBN: 9780670095940, Chapter 10.

Vocational Education

7.57 Vocational education has received focused attention in the NEP 2020, which mandates its mainstreaming in all institutions, with focus areas based on skills gap analysis and mapping of local job opportunities. This includes the development of pre-vocational capacities in children in the Foundational and preparatory stages and exposure to work in the middle stage, thus equipping them to achieve vocation-specific capacities/skills in the secondary stage in accordance with their aptitude, competence, and aspirations.

7.58 Under the Samagra Shiksha Scheme, a non-recurring grant for purchasing tools and equipment, including furniture, computers, etc., is given to states/UTs to augment school infrastructure and accommodate vocational education. Assistance is also provided for capacity building of teachers/skill trainers, development of competency-based curriculum and teaching learning material, development of management information system, etc. States/UTs can choose from NSQF-compliant 113 job roles in 22 sectors.⁵⁶

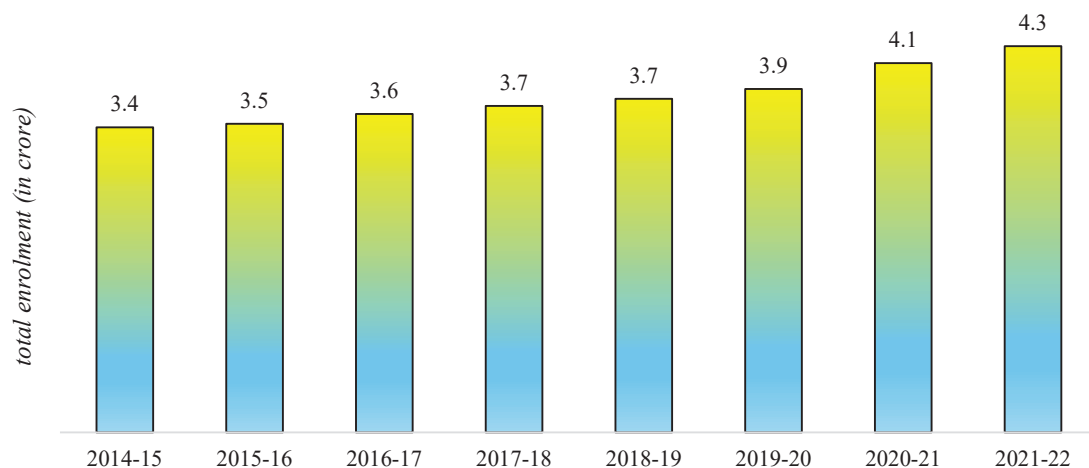
7.59 In terms of progress achieved, 29,342 Schools have been covered under skill education from FY19 to FY24 (till March 2024). 22 sectors with 88 job roles were covered under Skill education till FY24. A total of 25 new job roles were introduced in FY24 under the Hub and spoke model, under which infrastructure of the hub schools can be utilised by the nearby spoke schools, 1011 spoke schools have been approved. Exposure of skill education to upper primary students has been approved for 1,08,418 schools for FY25, and exposure has been given to 3643981 students. Employability skill modules, including communication skills, self-management skills, ICT skills, entrepreneurship skills, and green skills, have been included in the job roles curriculum.

Higher Education

7.60 The higher education sector, comprising tertiary and post-school learning in universities and other institutions, has witnessed an acceleration in total enrolment coupled with rising 'enrolment equity' over the past eight years. As per AISHE 2021-22⁵⁷, total enrolment in higher education has increased to nearly 4.33 crore in FY22 from 4.14 crore in FY21 and 3.42 crore in FY15 (an increase of 26.5 per cent since FY15).

⁵⁶ The 22 sectors are: Aerospace and Aviation, Agriculture, Apparel Made ups & Home Furnishing, Automotive, Banking Finance and Insurance Services (BFSI), Beauty and Wellness, Construction, Electronics & Hardware, Handicrafts and Carpets, Healthcare, Information Technology/Information Technology Enabled Services (IT/ITeS), Management & Entrepreneurship, Media & Entertainment, Food Industry, Physical Education & Sports, Plumber, Power, Retail, Security, Telecom, Tourism & Hospitality, Transportation Logistics & Warehousing.

⁵⁷ All India Survey on Higher Education (AISHE) is the only comprehensive survey by the Ministry of Education (MoE) to capture the data on Higher Education in the country since 2011 to create a robust and inclusive database for Higher Education. Information in AISHE 2021-22 is related to financial year 2021-22, i.e. From 1st April 2021 to 31st March 2022.

Chart VII.6: Total students' enrolments in higher education

Source: All India Survey on Higher Education (AISHE) report 2021-22, Ministry of Education

Rising equity in higher education

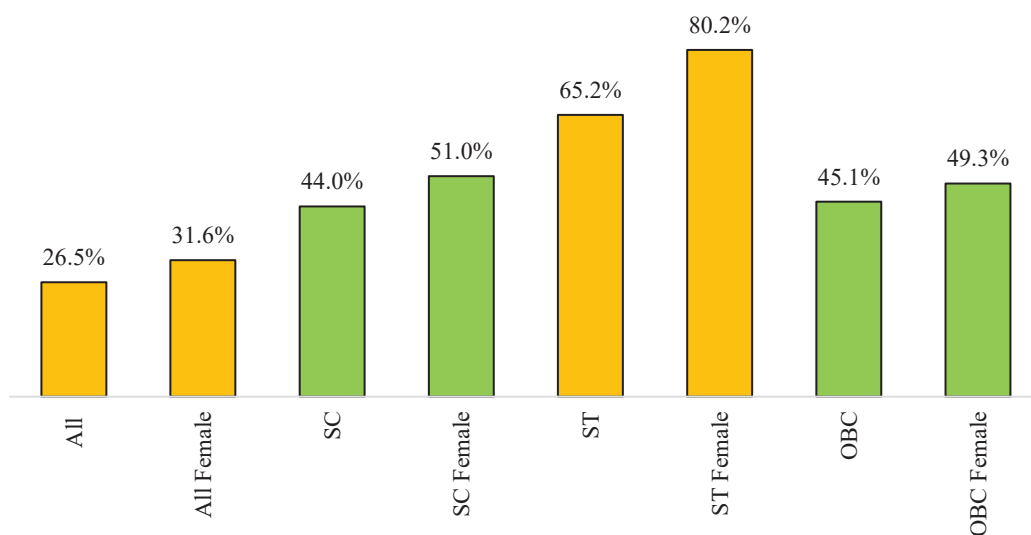
7.61 The rise in enrolment in higher education has been driven by underprivileged sections such as SC, ST and OBC, with a faster growth in female enrolment across sections. Female enrolment in higher education increased to 2.07 crore in FY22 from 1.57 crore in FY15, i.e., a 31.6 per cent increase since FY15. The growing equity in higher education implies better employment opportunities for the hitherto backward sections.

**Table VII.6: Enrolment in higher education from various categories
(numbers in lakhs)**

	2014-15	2021-22
All	342	433
All Female	157	207
SC	46.1	66.2
SC Female	21	31.7
ST	16.4	27.1
ST Female	7.5	13.5
OBC	113	163
OBC Female	52.4	78.2

Source: AISHE 2021-22, Dept. of Higher Education, Ministry of Education

Chart VII.7: Growth in enrolment in higher education institutions between 2014-15 and 2021-22 (per cent)



Source: AISHE 2021-22, Dept. of Higher Education, Ministry of Education

Re-imagining lifelong learning through a digital prism

7.62 India has 26.52 crore students in school, 4.33 crore in higher education and more than 11 crore learners in skilling institutions. The vast expanse of the educational landscape comprises 14.89 lakh schools, 1.50 lakh secondary schools, 1.42 lakh higher secondary schools⁵⁸, 1,168 Universities, 45,473 colleges, 12,002 standalone institutions⁵⁹, 94.8 lakh teachers in school education and 15.98 lakh teachers in higher education.

7.63 These sweeping figures put into perspective the enormity of the challenge and the inherent ambition of the NEP 2020 to transform India's educational ecosystem. NEP lies at the heart of efforts towards strengthening institutional capacity to embed lifelong learning in the education and skills ecosystem. It calls for interconnectedness of initiatives across formal, non-formal, and informal modes to make learning systems more holistic, multidisciplinary, and comprehensive to address diverse learning needs.

7.64 The National Credit Framework (NCrF), announced under NEP in April 2023, forms the bulwark of the regulatory architecture underpinning life-long learning. Bolstering the regulatory architecture is an extensive array of digital solutions, such as digital public infrastructure (DPI), which act as force multipliers. Prime among India's educational DPIs is APAAR, i.e. Automated Permanent Academic Account Registry, which serves as an electronic registry for institutions, students, and faculty by creating unique identities and lifelong academic credentials for each stakeholder in the education space. APAAR is supplemented by the Academic Bank of Credits (ABC), an online repository of academic credits that facilitates students' mobility across Higher

58 <https://dashboard.udiseplus.gov.in/#/reportDashboard/sDashboard>

59 <https://tinyurl.com/4sp5tkpz>

Education Institutions (HEIs) through a formal process of credit recognition, accumulation, transfer and redemption. Once an APAAR ID is created, HEIs map the credits a student earns to their ID, with all such credits stored in the ABC in demat form.

7.65 The twin solution of APAAR and ABC, by allowing real-time verification of identity and academic credentials, paves the way for several interesting use cases. These include the possibility of students pursuing credit courses from different institutions for a particular qualification (now a reality) or targeting scholarships/ internships/ educational loans using academic profiles. With the data consent layer built into these DPIs, an exciting world of possibilities opens where the data principal (students) can share their academic credentials with prospective employers or institutions for internships, jobs or collaborative opportunities. As of July 2024, 2037 HEIs have onboarded ABC, and 30.13 crore APAAR IDs have been created for students of higher education, school education and skill institutes.⁶⁰

7.66 India's online learning architecture has been instrumental in creditisation, with University Grants Commission (UGC) Regulations enabling students to earn up to 40 per cent of credits from online courses. Box VII.7 below gives a detailed list of major initiatives in this regard.

Box VII.7: India's online learning architecture

Powered by the combination of Study Webs of Active Learning for Young Aspiring Minds (SWAYAM), SWAYAM PRABHA and SWAYAM Plus, indigenously crafted platforms have emerged as powerful catalysts in bridging the digital divide and achieving the cardinal principles of NEP, viz., access, equity and quality.

- SWAYAM, an open learning MOOC platform, has been pivotal in ensuring students across India have access to high-quality content, thus mainstreaming them into the knowledge economy. The platform has 13140+ course offerings across disciplines, including emerging technologies like AI, Machine Learning and cloud computing. With an enrolment of 4.3 crore, SWAYAM has emerged as one of the most popular e-learning platforms today.
- SWAYAM PRABHA, a DTH (Direct to Home) Satellite TV service comprising 48 DTH channels, has provided UG/PG level educational content across various subjects, available 24x7 with a structured schedule. This service has a remarkable reach, captivating over 1.2 million students and viewing 143,000+ unique videos, totalling 86,000+ hours of watch time.
- SWAYAM Plus is an online platform led by IIT Madras, featuring high-quality courses for credit recognition in collaboration with academia and industry leaders like L&T and Microsoft. It aims to boost employability among college students and lifelong learners, especially in Tier 2 and Tier 3 cities, through courses developed in partnership with industry, focusing on areas such as Manufacturing, Energy, Computer Science & Engineering/IT/ITES, Management, Healthcare, Hospitality & Tourism, and Indian Knowledge Systems. The initiative provides an avenue for upskilling and reskilling to meet dynamic industry requirements.

60 <https://www.abc.gov.in/>

- The NEP emphasises enhancing mobility, flexibility, and choices in higher education. SAMARTH, an e-governance solution developed in collaboration by the Ministry of Education with the Indian Institute of Crafts and Design, aims to digitally transform administrative processes in HEIs, from admissions to awarding degrees. It has been adopted by over 3500 HEIs, including Central Universities, State Universities, Colleges, IITs, IIMs, etc., contributing to establishing a network of digitally-enabled campuses across India.
- The PM e-VIDYA initiative unifies digital education efforts, offering diverse content access through DIKSHA and Sathee platforms. DIKSHA features over 3.5 lakh e-contents and 6,854 Energized Textbooks in 30+ languages.⁶¹ Sathee platform provides resources for competitive exam preparation, including around 2000 video lectures, 80,000+ problems, mock tests, an AI chatbot, and mentorship from IIT and AIIMS students for NEET and JEE aspirants.

Way forward in education

7.67 As education is one of the most critical areas for India's development, mission-mode and cost-effective implementation of well-designed and well-intentioned programmes is essential to improve the quality of education, especially primary education, without which further years of education add little value. To realise the same, unity of purpose and convergence of efforts across the centre, state, and local Governments is called for, as 'public education' is a concurrent list subject.

7.68 To operationalise vocational education across the learning ladder, the model of Lend A Hand India (LAHI), an NGO, is a good example. The LAHI model includes civil society's collaboration with the Governments to introduce vocational education as a core curriculum component, establish labs, recruit and train vocational trainers, organise internships, and offer placement support. By providing comprehensive vocational education services and engaging with key stakeholders, civil society can play an active role in implementing the novel features of NEP 2020.

7.69 Increasing the cost-effectiveness of public spending on education requires spending on pedagogy and governance. This can include filling supervisory positions to monitor teaching quality, recognition of good and bad teacher performance, and hiring of local volunteers to ensure 'teaching at the right level' as textbook completion means little if children are way behind curricular standards (Muralidharan 2024)⁶²

India making headway in R&D

7.70 Research and Development (R&D) is an important source of innovation, progress and increased productivity in an economy. In economics, the endogenous growth theory highlights the long-run economic growth to be determined by the rate of technological progress, alluding to the ultimate sway of R&D on a nation's progress. R&D provides businesses with the technical know-how to improve productivity, reduce operating costs and raise competitiveness.⁶³ In

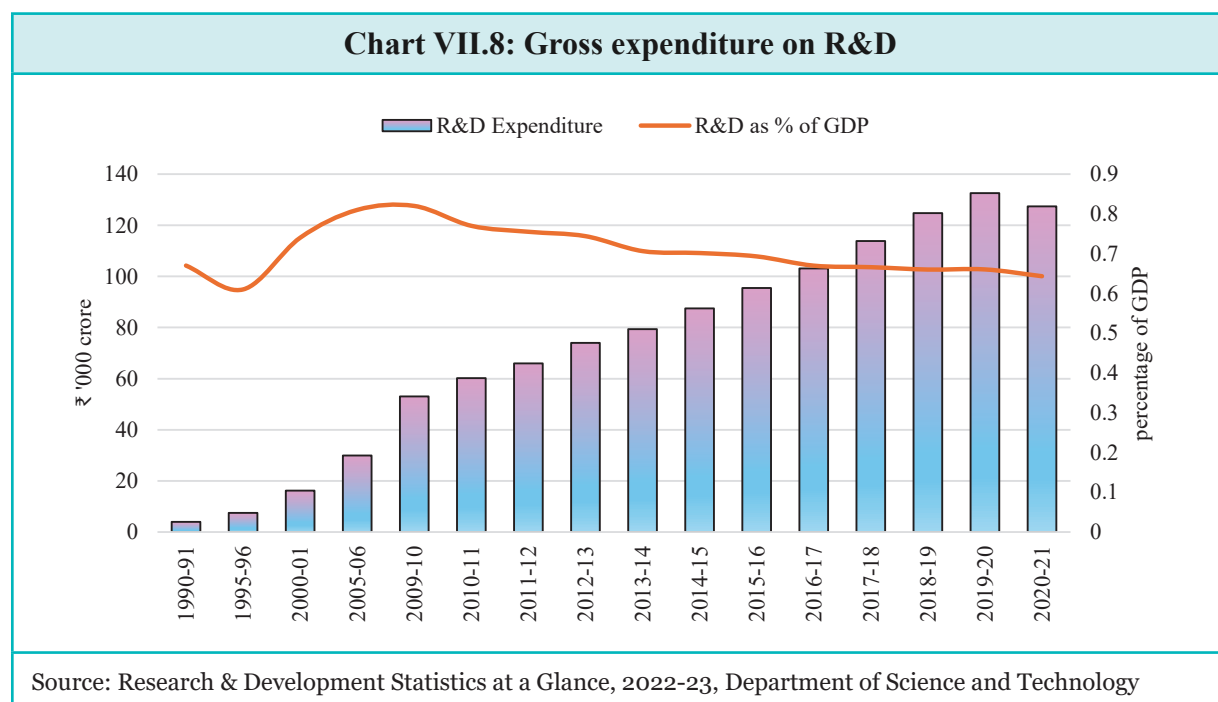
61 <https://tinyurl.com/2xj6ra8h>

62 Muralidharan, K. (2024): "Accelerating India's Development: A state-led roadmap for effective governance". Penguin India Viking, ISBN: 9780670095940, Chapter 10.

63 Joshi, P L. (2023): "India needs to boost investments in research and development (R&D) to increase its global might" Vol 4 No 1, 2023. 4. 1-13. 10.47509/GJAER.2023.v04i01.01.

emerging areas such as AI, environment sciences, biotechnology, etc. R&D serves both economic and strategic interests.

7.71 India is making rapid progress in R&D, with nearly one lakh patents granted in FY24⁶⁴, compared to less than 25,000 patent grants in FY20.⁶⁵ According to WIPO, India saw the highest growth (31.6 per cent) in patent filings in 2022⁶⁶, demonstrating its evolving innovation landscape and potential for further growth in intellectual property creation. India has consistently improved its rank in the Global Innovation Index from 81st position in 2015 to 40th in 2023, as per GII (2023).⁶⁷ On the human resource side, total Ph.D. enrolment in India has increased to 81.2 per cent in FY22 (2.13 lakh) from FY15 (1.17 lakh).⁶⁸ The Gross Expenditure on R&D (GERD) in the country has been consistently increasing over the years and has more than doubled from ₹60,196.8 crore in FY11 to ₹ 127,381 crore in FY21 (Chart VII.8).



7.72 As a mark of India's ascent in high-quality research, the country climbed up to 9th rank in the Nature's Index 2023⁶⁹, overtaking Australia and Switzerland⁷⁰. India's share⁷¹ of high-quality research articles (measured in terms of absolute numbers and not percentages) increased by 44 per cent in the past four years, i.e., from 1039.7 in 2019 to 1494.7 in 2023. However, India's share remains significantly lower compared to above 20,000 share of China and the US each.

64 PIB release dated 16 March 2024 <https://tinyurl.com/34dz2bfh>

65 PIB release dated 12 April 2022 <https://tinyurl.com/2j4p533n>

66 World Intellectual Property Organization (WIPO) (2023). World Intellectual Property Indicators 2023. Geneva: WIPO. page 30, exhibit A.18

67 PIB release dated 29 December 2023 <https://tinyurl.com/2w2zuefr>

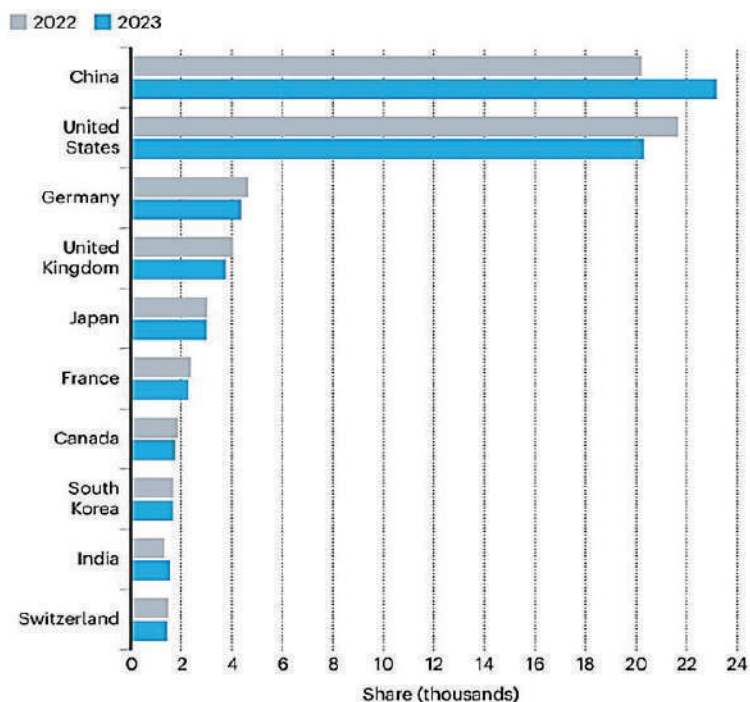
68 PIB release of AISHE report, dated 25 Jan 2024 <https://tinyurl.com/43fh85v2>

69 The Nature Index provides absolute Count and fractional Share counts of article publication at the institutional and national level and, as such, is an indicator of global high-quality research output and collaboration.

70 Benjamin Plackett, 18 June 2024, Nature Index News <https://tinyurl.com/yc8syskb> accessed on 25 June 2024

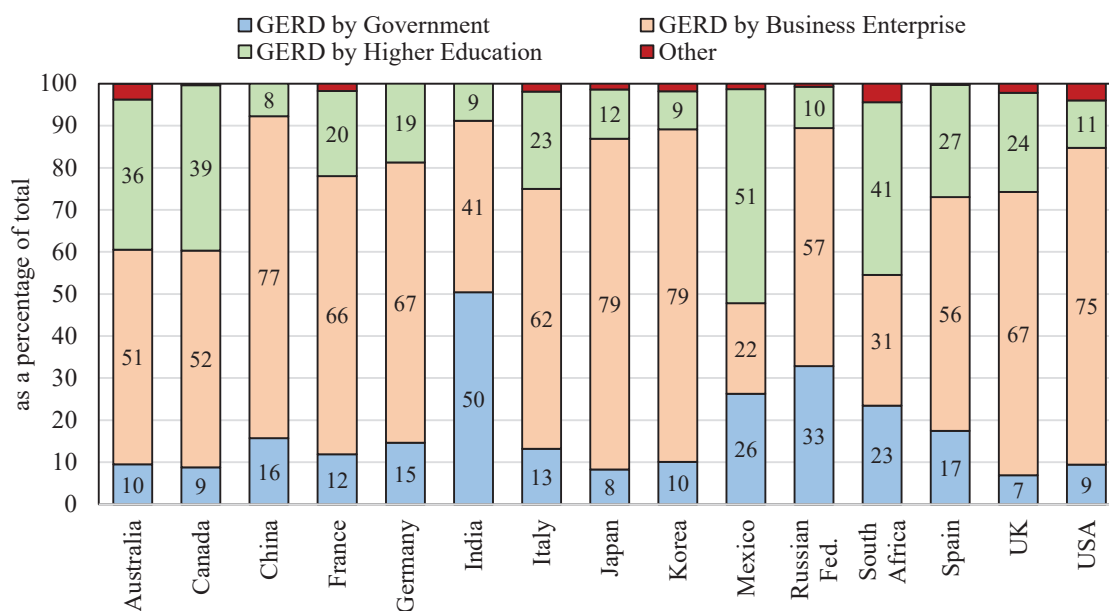
71 Share is a metric that measures contribution to papers in the Index by authors based in a country compared to all authors of the article. For instance, if there are 4 authors of an article and all 4 are from India, it will add 1.0 to India's share. If 2 out of 4 authors are from India, it will add 0.5 to India's share.

Chart VII.9: Contribution to high-quality research papers by top ten countries in the Nature Index



Source: Nature Index 2024 Research Leaders

Chart VII.10: Participation of Government, business enterprise & higher education sector, 2020



Source: Research & Development Statistics at a Glance, 2022-23, Department of Science and Technology

7.73 However, India's R&D investment as a percentage of GDP stands at 0.64 per cent, compared to China (2.41 per cent), the US (3.47 per cent), and Israel (5.71 per cent). Moreover, the private sector's contribution to R&D remains low at 36.4 per cent of the country's GERD compared to China (77 per cent), US (75 per cent), etc.⁷².

7.74 To better translate GERD to research output, the link between higher education, industry and research must be strengthened. Another challenge is low 'Land to Lab' time. Institutions in India develop technologies, but their transformation rate from the lab to the society for the benefit of the people remains low.⁷³

7.75 Several efforts are underway to attract research personnel and create adequate opportunities in the research ecosystem of the nation. The ease of doing research is being bolstered through streamlining of patent grants, leading to a drastic reduction in the average time taken for examination of a patent application from 72 months in 2015 to between 5 to 23 months in 2022, depending upon fields of technology.⁷⁴ The Government has recently decided to increase the scholarships for students pursuing PhD and Post-Doctoral research.⁷⁵ Further, India has launched its own National Research Foundation called 'Anusandhan'⁷⁶ operationalised by the Department of Science and Technology (under the Anusandhan National Research Foundation Act, 2023 Act⁷⁷). This foundation will act as an apex body that aims to strengthen and promote the R&D ecosystem. In the interim budget of FY25, the Government also announced a corpus of 1 lakh crore for research and innovation in the country, adopting the slogan "*Jai Jawan, Jai Kisan, Jai Vigyan, Jai Anusandhan*".

SOCIAL AND ECONOMIC EMPOWERMENT OF WOMEN

7.76 India is transitioning from women's development to women-led development with the vision of a new India where women are equal partners in the story of growth and national progress. To realise the clarion call to Nari Shakti, the Government has made various legislative interventions and enabling provisions to ensure women's participation in various professions.

7.77 India's G20 Presidency in 2023 also listed 'women-led development' as one of its six priorities amid rising global attention towards women's workforce participation. With the award of the Noble Prize in Economics to Prof. Claudia Goldin for her work on key drivers of gender differences in the labour market, the widespread recognition of gender issues is apparent.

7.78 The issues affecting women range from lack of basic necessities such as sanitation, piped water, menstrual hygiene etc., safety, proper nutrition, economic and political equality of opportunity, and a sense of individual identity. Transitioning from women's development to women-led development requires a 360-degree review of the issues and a sincere, pragmatic approach to tackling them.

72 <https://dst.gov.in/document/reports/rd-statistics-glance-2022-23>

73 Strategy for New India@75, NITI AAYOG <https://tinyurl.com/bdzdzb2u>

74 PIB release dated 30 March 2022 <https://tinyurl.com/y4s82kts>

75 PIB release dated 16 March 2023 <https://tinyurl.com/5h5buk9y>

76 <https://dst.gov.in/anusandhan-national-research-foundation-anrf>

77 The Anusandhan National Research Foundation Act, 2023 is an Act of the Parliament of India. It seeks to regulate all research and development in the fields of natural sciences establishments in India. It repeals the Science and Engineering Research Board Act, 2008 and dissolves the SERB.

7.79 With this intent, the Government of India has undertaken multipronged initiatives to improve the well-being of women in the socio-political and economic context.

Steady Rise in Gender Budget

7.80 Over the years, the element of women-centricity in Government initiatives has been rising and is visible in the expanding gender budget. In FY14, the Government provisioned ₹97,134 crore (BE) on the schemes for the welfare and empowerment of women, which has consistently increased over the years and reached ₹3.10 lakh crore in FY25. This shows a 38.7 per cent rise in the Gender Budget Statement (GBS)⁷⁸ vis-à-vis FY24 BE and a 218.8 per cent increase over FY14 BE. The share of the Gender Budget in the total Union Budget has increased to 6.5 per cent in FY25, the highest since the introduction of GBS in FY06.⁷⁹

Social empowerment of women

7.81 Women-led development begins with ensuring the health and education of the girl child. The emphasis on “Beti Bachao, Beti Padhao” has sensitised collective consciousness towards cherishing, educating, and saving for the girl child (via Sukanya Samridhi Yojana)⁸⁰. The sex ratio at birth (SRB) at the national level has improved from 918 (2014-15) to 930 (2023-24, provisional),⁸¹ and the maternal mortality rate has declined from 130/lakh live births in 2014-16 to 97/lakh live births in 2018-20.⁸²

7.82 Over the last decade, the prevalence of institutional delivery has increased from 78.9 per cent in 2015-16 to 88.6 per cent in 2019-21.⁸³ Besides a rise in incomes and awareness of health practices, the positive trend is attributable to the Government’s programme to incentivise institutional delivery through Janani Shishu Suraksha Karyakram. The PM Matru Vandana Yojana⁸⁴, entailing a cash payment of ₹ 5000 for the birth of the first child and ₹6000 for second child who is female, encourages proper rest for the new mothers by partially compensating for any wage loss. Called India’s largest conditional cash transfer programme ever, the scheme has been empirically associated with positive side effects of rise in long-term utilisation of public health services and increasing the interval between births (Haaren and Klonner 2021).⁸⁵

Nutritional security of women and children through Anganwadi centres

7.83 The nutritional status of women is doubly important – first, for their own health, productivity, and well-being, and second, for preventing malnutrition in their young ones. Women’s health thus forms the bedrock of societal health. In recognition of this, the Mission

78 The Gender Budget Statement is a reporting mechanism for Ministries/Departments to review their Programmes from a gender perspective and present information on allocations for women and girls.

79 Source: Budget documents, Union Government

80 Sukanya Samridhi Yojana is a flagship small deposits scheme for financial planning for the girl child. The scheme has more than 3.1 crore accounts to its credit

81 Source: Health Management Information System (HMIS) of Ministry of Health & Family Welfare

82 Source: Sample Registration Survey

83 Source: NFHS-5, India Fact Sheet available at https://rchiips.org/nfhs/NFHS-5_FCTS/India.pdf.

84 The scheme was launched in 2017. As of December 2023, 3.59 crore beneficiaries have been enrolled, of which 3.05 crore beneficiaries have been provided benefit with a total disbursement of ₹13,460 crore. <https://tinyurl.com/tnpesma8>

85 von Haaren P, Klonner S. (2021): “Lessons learned? Intended and unintended effects of India’s second-generation maternal cash transfer scheme” Health Econ. 2021 Sep;30(10):2468-2486.

Saksham Anganwadi & Poshan 2.0 programme endeavours to address malnutrition in pregnant women, lactating mothers, children, and adolescent girls by adopting a lifecycle approach to achieve a malnutrition-free India.

7.84 As an integrated nutrition support programme⁸⁶, it shifts the focus from calorific sufficiency alone to improved health, wellness, and immunity through micronutrient sufficiency. It also includes awareness building on infant and young child feeding practices (including breastfeeding and complementary nutrition), maternal and adolescent nutrition, treatment of malnourished children, and promoting AYUSH practices. The programme lays thrust on improvement in process (using growth measurement devices, equipping Anganwadi workers with smartphones, using Poshan Tracker⁸⁷ for real-time progress and dynamic identification of malnutrition) and behavioural change through community-based events such as Poshan Maah and Poshan Pakhwada, and counselling on health practices. In a further widening of their ambit, Anganwadi centres are being upgraded to Saksham Anganwadis⁸⁸, equipped with LED screens, audio-visual teaching aids, Poshan Vatikas, rainwater harvesting structures, etc., to act as institutions of early childhood care and education for all children.

7.85 The battle against *Kuposhan* stands to benefit from the participation of Panchayat and women's collectives, as exemplified in Odisha's case, where *Jaanch* Committees and Mothers Committees have been set up at the village level to monitor and strengthen the services provided by the ICDS program. The Mothers Committees ensure the quality of meals at AWCs, while the *Jaanch* Committees oversee the feeding programs' quality and quantity accreditation. This setup enhances the accountability of SHGs and increases trust in the safety of the provided food.⁸⁹

7.86 *Access to basic necessities*: For women-led development to even begin, gender-specific disadvantages affecting a large section of women belonging to rural and low-income households need to be tackled first. Towards this goal, the construction of toilets under 'Swachh Bharat Mission', the provision of clean cooking gas connections under 'Ujjawala Yojana' and the provision of tap drinking water connections under 'Jal Jeevan Mission' have transformed the lives of women by reducing the drudgery and care burden. These initiatives, besides addressing concerns of safety and dignity, also free up time and energy for productive work such as participation in women's collectives through National Rural Livelihood Mission (NRLM).

7.87 *Safety through Sambal*:⁹⁰ To deal with gender violence and safety issues, one-stop centres⁹¹ or Sakhi centres offer regular and emergency access to medical and legal aid, police

86 The mission integrates three existing schemes, i.e., Anganwadi Services, Poshan Abhiyaan and Scheme for Adolescent Girls, to be implemented during the 15th Finance Commission period 2021-22 to 2025-26

87 As of 31 May 2023, 10.06 crore beneficiaries (pregnant women, lactating mothers, and children up to 6 years) are registered under Poshan Tracker.

88 Under the programme, 2 lakh AWCs will be upgraded to Saksham Anganwadis @40,000 annually up to 2025-26.

89 Kapur, K. and Suri, S. (2020): "Towards a Malnutrition-Free India: Best Practices and Innovations from POSHAN Abhiyaan," ORF Special Report No. 103, March 2020, Observer Research Foundation.

90 Mission Shakti has been launched as a comprehensive solution to the perceived need for women's safety, rehabilitation, and empowerment. The Mission comprises two sub-schemes, 'Sambal' for the safety and security of women and 'Samarthya' for the empowerment of women. Under Samarthya, existing schemes of Pradhan Mantri Matru Vandana Yojana (PMMVY), Ujjwala & Swadhar Greh named as Shakti Sadan; Working Women Hostel named as Sakhi Niwas; Gender Budgeting; National Creche Scheme (PALNA); along with a new component of Hubs for Empowerment of Women at National, State and District level have been subsumed.

91 801 One Stop Centres OSCs have been approved, of which 733 are operational in nationwide since 1 April 2015.

facilitation, temporary shelter and counselling to empower women affected by violence and in distress to seek justice and rebound from adversity. The 24-hour toll-free women's helpline '181'⁹² offers prompt response on Government schemes and emergency services.

7.88 *Education and Skilling*: India has a long history of social reform movements advocating women's education, with Savitribai Phule⁹³ stating in the 19th century that "...a woman without education is like a banyan tree without roots or leaves." Women's education continues to be an instrument of empowerment in terms of decision-making, intra-household bargaining power, control over resources, and political engagement (Engida 2017).⁹⁴ Sinha (2023) attributes the high rate of human development indicators in southern states of India to high female enrolment in secondary education, which propelled the participation of a sizeable chunk of aware and confident women in development work and self-help groups.⁹⁵

7.89 In terms of enrolment in schools, gender parity has been achieved at all levels⁹⁶ with the implementation of the Sarva Shiksha Abhiyan (launched in 2000) and the Right to Education Act 2009. In higher education, the female GER has been greater than male GER for five consecutive years.⁹⁷ While this implies rising importance of girls' education, its translation to economic empowerment will require better learning outcomes, employability, labour force participation and conducive infrastructure.

7.90 The skilling schemes put a special focus on covering women. Under PMKVY, the participation of women among those trained has increased from 42.7 per cent in FY16 to 52.3 per cent in FY24. Under the Jan Shikshan Sansthan (JSS) Scheme, women constituted about 82 per cent of the total beneficiaries. In the long-term ecosystem, i.e., in ITIs and National Skill Training Institutes (NSTIs), the participation of women has gone up from 9.8 per cent in FY16 to 13.3 per cent in FY24. Under NAPS, the participation of women also increased from 7.7 per cent in FY17 to 20.8 per cent in FY24. However, to materialise the gains from skilling programmes, they need to be complemented with supportive infrastructure such as safe and affordable transport and logistics, creches, and long-term career counselling.

7.91 *Women in Science*: According to World Bank data for 2018⁹⁸, India has among the highest proportion of female Science, Technology, Engineering, and Mathematics (STEM) graduates, at 42.7 per cent. However, the share of female scientists in Research and Development is only 18.6 per cent.⁹⁹ To rectify this contrast, the umbrella scheme 'Women in Science and Engineering-KIRAN (WISE KIRAN)' strives to boost the involvement of women in STEM fields. Between

92 As of now, Women Help Lines are operational in 34 States/ UTs. The WHLs have handled more than 1.26 crore calls so far and have assisted more than 63.95 lakh women up to March 2023.

93 Savitribai Phule was a pioneer of modern Indian education, social reformer, and poet. Along with her husband, Jyotiba Phule, she established India's first girls' school in Pune in 1948.

94 Engida, Y.M. (2021). The Three-Dimensional Role of Education for Women Empowerment. Journal of Social Sciences.

95 Sinha, A. (2023): "The Last Mile: Turning Public Policy Upside Down". 1st edition. Routledge India. Chapter 11, Revisiting Skills for Full Employment

96 See data at UDISE+ dashboard of Dept of School Education, at <https://dashboard.udiseplus.gov.in/#/reportDashboard/sReport>

97 That is, from 2017-18 to 2021-22, as per All India Survey on Higher Education (AISHE) report by Dept. of Higher Education, Ministry of Education.

98 <https://tinyurl.com/mr4btwfx>

99 PIB release dated 7 February 2024 <https://tinyurl.com/5n8p8y29>

2018 and 2023, nearly 1962 women scientists benefitted under the Women Scientist Scheme, which provides opportunities for women scientists, especially those with a career break. The Vigyan Jyoti programme, initiated in 2020, aims to address the underrepresentation of girls in various science and technology courses from 9th to 12th grades. As of December 2023, around 21,600 female students of Class IX-XII from 250 districts are enrolled under this programme. In April 2023, the Council of Scientific & Industrial Research (CSIR) started exclusive Research Grants for Women Scientists under CSIR-ASPIRE and dedicated an exclusive portal. Women's leadership in cutting-edge space research programmes like the Chandrayaan-3 and Aditya-L1 solar missions reflects the ongoing gender transformation in niche scientific sectors.

7.92 *Breaking into male bastions:* The Government has also made enabling provisions allowing women's participation in non-conventional sectors such as fighter pilots in the Indian Air Force, Commandos, Central Police Forces, admissions in Sainik Schools, etc.

7.93 *Political empowerment:* In the arena of public life and political empowerment, the Nari Shakti Vandan Abhiniyam, 2023 (NSVA) is a leap towards women's political participation, empirically associated with improved institutions and greater integrity. In Indian history, the reservation of one-third of seats for women in Panchayats was constitutionalised in 1991, and three decades later, 46 per cent of elected representatives of Panchayats are women. According to research, reservations for women in panchayats have led to greater investment in public goods closely linked to women's concerns, such as drinking water and public roads.¹⁰⁰ Besides, female political representation is also associated with better child health¹⁰¹ and primary education outcomes.¹⁰² Along those lines, the NSVA opens new possibilities for inclusive growth besides being a beacon of gender equality.

7.94 *Transformation of the feminine identity:* *Nari Shakti* begins with the recognition of women as individuals with an independent identity. The significance of this can be seen in an interesting example in history. In 1952, when the Election Commission of India was preparing for the first general elections in independent India, nearly 28 lakh women enrolled not using their proper names but as a mother/wife of someone, leading to the invalidation of their voter registration.¹⁰³ The India of today has come far ahead, and multiple steps have been taken to strengthen the identity of women citizens, recent ones including the issuance of ration card in the name of the eldest woman of the household under NFSA, 2013¹⁰⁴, requirement of female's joint or sole ownership of houses constructed under PM Awas Yojana¹⁰⁵, reaching more than 25 crore unbanked women through the Jan Dhan Yojana¹⁰⁶, and collectivisation of nearly 10 crore rural women under SHGs¹⁰⁷.

100 Chattopadhyay, R and Duflo, E (2004), "Women as Policy Makers: Evidence from a Randomized Policy Experiment in India", *Econometrica*, vol. 72, no. 5, 2004, pp. 1409–43.

101 Bhalotra, S. and Clots-Figueras, I. (2010): "Health and the Political Agency of Women," mimeo, Bristol University.

102 Clots-Figueras, I. (2007) "Are female leaders good for education? : Evidence from India," UC3M Working papers. Economics we077342, Universidad Carlos III de Madrid.

103 *The Hindu*, 19 March 2024, <https://tinyurl.com/ytsy4d3z>

104 National Food Security Act, 2013.

105 Under PM AWAS Yojana (Gramin), 26.6 per cent of the 2.41 crore completed houses are solely in the name of women, and 69 per cent are jointly in the name of wife and husband.

106 <https://tinyurl.com/bd7234z6>

107 Source: PIB release 6 Feb 2024, Release ID: 2003170 <https://tinyurl.com/3nh99vnb>

Economic empowerment of women

7.95 *Rising participation in the labour force*: Increased access to education and skill development, as well as other initiatives for women’s empowerment, has elevated the participation of women in the nation’s development and progress. The female LFPR rose to 37 per cent in 2022-23 from 23.3 per cent in 2017-18. However, rural India has driven the trend, where nearly three-fourths of the women workers are engaged in agriculture-related work. Thus, the rise in LFPR needs to be tapped into higher value-addition sectors suitable to the needs and qualifications of the rural female workforce, and agro-processing emerges as a good contender for the same, as discussed in the chapter on Employment. The role of valuable employment in changing girls’ image from liability to breadwinner is exemplified in the story of Krishnagiri district in Tamil Nadu, discussed in Box VII.8.

Box VII.8: Girls of Krishnagiri writing their own destinies with the ink of financial independence¹⁰⁸

A recent spate of industrial investment in the last decade has led to significant job creation for females in Krishnagiri, a remote district in Tamil Nadu, catalysing a positive socioeconomic chain reaction. The experience shows how women’s financial independence is deeply linked with their overall development, besides being a pivot for social change.

The district was reeling under a high incidence of child marriage, prenatal sex selection, a low child-sex ratio (of 920, compared to the state average of 946)¹⁰⁹, and low female literacy (at 65 per cent)¹¹⁰.

The setup of manufacturing units in electronics, mobile assembly, electric scooters, footwear, etc., has favoured large-scale employment of women, as manufacturers believed female workers to be more productive and dexterous. This triggered a mindset shift as households who considered girls a burden now view them as breadwinners, besides bolstering Government welfare efforts towards female empowerment. This has resulted in a declining incidence of child marriage and school dropout rates of girls, a rise in the average age of marriage, coupled with a surge in female enrolment in polytechnic institutes.

The Krishnagiri experience also spurred second-order effects from the state and corporates. The state Government-initiated policies on providing career guidance in Government schools from class 9th itself, setting up industrial hostels, counselling parents, etc. The rising demand for female employees has also instilled hiring competition among companies, luring their workforce with better pay and relaxation in education criteria by introducing on-the-job training, pick-up and drop facilities, daycare facilities, etc.

7.96 To truly realise the gender dividend of workforce participation by an increasingly educated and skilled female population, proper development of the care economy is essential and long pending, as discussed in the following chapter on Employment.

108 Sourced from a media article: Madhavan, N., 27 Feb 2024, “Why women, once ignored, are being treasured in Krishnagiri” Livemint, <https://tinyurl.com/57pkyrra> accessed on 4 June 2024.

109 Census of India, 2011.

110 <https://krishnagiri.nic.in/about-district/district-at-a-glance/> accessed on 4 June 2024.

7.97 *Financial Inclusion*: Access to financial services improves women's control over household resources and is a gateway to accessing credit and insurance. The PM Jan Dhan Yojana has facilitated the opening of 52.3 crore bank accounts, of which 55.6 per cent of accountholders are women as of May 2024. This is accompanied by a rise in average deposits by nearly four times, from ₹1,065 in March 2015 to ₹4,398 in May 2024.

7.98 *Rural Microfinance*: The Deendayal Antyodaya Yojana- NRLM, which is the Government's Self-Help Groups (SHGs)¹¹¹ programme covering more than 89 million women into 8.3 million SHGs¹¹², has been empirically associated with women empowerment, self-esteem enhancement, personality development, reduced social evils, and medium impacts in terms of better education, higher participation in village institutions and better access to Government schemes. The mission also emphasises social capital and inter-regional knowledge sharing and handholding by community resource persons (CRPs), who are women who have emerged out of poverty through hard work and enterprise. Called the foot soldiers of the livelihood movement, more than 3.5 crore CRPs (comprising Krishi Sakhis, Pashu Sakhis, Bank Sakhis, Bima Sakhis, Banking Correspondent Sakhis) are instrumental in implementing and scaling up SHGs¹¹³. Success stories include Kudumbashree in Kerala, Jeevika in Bihar, Mahila Arthik Vikas Mahila Mandal in Maharashtra, and recently, Looms of Ladakh. The programme is discussed in further detail in Box VII.10 of this chapter.

7.99 *Entrepreneurship*: Female participation has been quite encouraging in the wave of entrepreneurship through Start-up and Stand-Up India. Around 68 per cent of the loans have been sanctioned to women entrepreneurs under PM Mudra Yojana, and 77.7 per cent of the beneficiaries under Stand-Up India are women, as of May 2024.¹¹⁴ Realising the vision of Digital India, more than 53 per cent of the Prime Minister's Rural Digital Literacy Campaign (PMGDISHA) beneficiaries are women (as of July 2023). Bain and Co. (2020) estimate that there are roughly 13.5-15.7 million women-owned businesses in India, making up 17-20 per cent of the country's total enterprises. With more encouragement and support, this number can increase to 31.5 million, i.e., one-third of all enterprises, by 2030, as per estimates.¹¹⁵

Towards equality of asset ownership

7.100 Although the social acceptance of women breaking into traditionally male domains such as flying a fighter plane, running a unicorn company, or leading a district/department has been rising with such news being celebrated, much scope remains in enhancing asset ownership among women and normalising female property rights. Besides the intrinsic moral worth of equality, female ownership of land/assets is crucial for their financial security and utilisation of economic opportunities, enabling rural women's control over resources for farming and related loans and household well-being through family-oriented rather than personal use of resources

111 SHG is a socially and economically homogenous group of up to 20 persons, formed voluntarily for the collective purpose of savings and credit, with no insistence on collateral for loans and end usage of credit.

112 PIB release dated 14 March 2023 <https://tinyurl.com/4a4eruau>

113 PIB release 6 December 2023, RU-33-01-335-061223/EXPLAINER <https://tinyurl.com/4a4eruau>

114 Source: Inputs from Dept of Financial Services

115 Bain & Company (2020): "Powering the Economy with Her: Women entrepreneurship in India" <https://tinyurl.com/43cw2vky> accessed on 21 June 2024

(Agarwal 1994)¹¹⁶. Property ownership has even been associated with decreased spousal violence (Agarwal and Panda, 2007)¹¹⁷. In spite of women-friendly legislation on succession, research estimates that only 14 per cent of landowners in nine sample states¹¹⁸ of India were women¹¹⁹ (Agarwal, Anthwal, and Mahesh, 2021). Even landowning women are found to face multiple issues, such as limited access to single titles, and smaller and inferior quality land¹²⁰ (Jain, Saxena, Sen, and Sanan, 2023).

7.101 The requirement of female ownership of houses constructed under PM AWAS Yojana¹²¹ is an effort by the state to nudge social change towards gender equity. Yet, broader progress will have to emerge from the grassroots, and, borrowing from the wisdom of literature published half a century ago, “*Indicators of social acceptance of any goals set for the future must include attitudes of men and women as well as the availability of institutionalised infrastructures that support the attainment of such goals*”.¹²² Substantive equality in asset ownership would indeed be a high point in actualising the independent identity of women. For development to be led by women, it will also have to be ‘owned’ by them.

RURAL ECONOMY: DRIVING THE GROWTH ENGINE

7.102 The integrated and sustainable development of rural India is at the heart of the Government’s governance strategy. The focus is on holistic economic betterment through decentralised planning, better access to credit, skilling of youth, enhanced livelihood opportunities, empowerment of women, social security net provision, basic housing, education, health, and sanitation facilities, etc. Thrust on welfare services like school infrastructure, primary healthcare centres, technology solutions to issues of governance, improved means of transport and communications, etc., is aimed at equipping the populace with long-term capabilities for living the kind of lives they value. This section presents some of the Government’s rural development policies and programmes.

Enhancing the quality of life in rural India

7.103 The Government is working towards providing basic amenities to all households in rural areas through many schemes and programmes. A summary of the progress in this regard follows.

116 Agarwal, B. (1994): “Gender and command over property: A critical gap in economic analysis and policy in South Asia,” *World Development*, Elsevier, vol. 22(10), pages 1455-1478, October.

117 Agarwal, B. and Panda, P. (2007): “Toward Freedom from Domestic Violence: The Neglected Obvious”, *Journal of Human Development*, 8(3), pp. 359–388. doi: 10.1080/14640880701462171.

118 The nine states include Andhra Pradesh (which in 2014 was split into Andhra Pradesh ‘new’ and Telangana) and Karnataka in south India; Gujarat, Maharashtra, and Madhya Pradesh in western and central India; and Bihar, Jharkhand, and Odisha in eastern India. Of course, this covers a small number of states against a total number of 28.




119 Agarwal, B., Anthwal, P., and Mahesh, M.. (2021): “How Many and Which Women Own Land in India? Inter-gender and intra-gender gaps”, *Journal of Development Studies*

120 Jain, C., Saxena, D., Sen, S., and Sanan, D.(2023): “Women’s land ownership in India: Evidence from digital land records”, *Land Use Policy*, Volume 133, 2023, 106835, ISSN 0264-8377

121 Under PM AWAS Yojana (Gramin), 26.6 per cent of the 2.41 crore completed houses are solely in the name of women, and 69 per cent are jointly in the name of wife and husband.

122 “Towards Equality, Report of the Committee on the Status of Women in India”, 1974, Ministry of Education and Social Welfare, Government of India, page 4, para 1.20.

Table VII.7: Quality of life in rural areas

<p>Basic Amenities</p> 	<ul style="list-style-type: none"> • 11.57 crore toilets and 2.39 lakh community toilet complexes were constructed under Swachh Bharat Mission- Grameen (as of 10 July 2024).¹²³ • 11.7 crore households provided tap water connection under Jal Jeevan Mission (as of 10 July 2024)¹²⁴ • Under PM-AWAS-Gramin, 2.63 crore houses were constructed for the poor in the last nine years (as of 10 July 2024)¹²⁵ • 10.3 crore LPG connections provided under PM Ujjwala Yojana since 2016 (as of 2nd June 2024)¹²⁶ • 21.4 crore rural households electrified under Saubhagya since 2015 (as of 31 March 2019)¹²⁷ • Digital India: 4.29 lakh common service centres functional in rural areas (as of July 2024)¹²⁸ • 15.14 lakh km road construction completed under Gram Sadak Yojana since 2014-15 (as of 10 July 2024)¹²⁹
<p>Banking and financial inclusion</p> 	<ul style="list-style-type: none"> • 9.79 crore beneficiaries registered under Regional Rural banks (as of 26 June 2024)¹³⁰ • 0.19 crore beneficiaries registered under Rural Cooperative banks (as of 26 June 2024)¹³¹ • 465.42 lakh new Kisan Credit card applications have been sanctioned (as of 5 January 2024)¹³² • More than 104.02 crore beneficiaries registered under various DBT schemes as of September 2023¹³³ • 35.7 crore RuPay debit cards have been issued under PMJDY (as of 26 June 2024)¹³⁴ • PFMS e-GramSwaraj integrated with over 2.63 lakh Panchayats out of 2.79 lakh onboarded for their payment transactions¹³⁵ (as of 10 July 2024)
<p>Education</p> 	<ul style="list-style-type: none"> • Rise in school infrastructure under Samagra Shiksha Abhiyan, push to Digital Learning through free online channels and study material, etc. (details in the section on education)

123 <https://sbm.gov.in/sbmgdashboard/statesdashboard.aspx>

124 <https://ejalshakti.gov.in/jjmreport/JJMIndia.aspx>

125 <https://dashboard.rural.nic.in/dashboardnew/pmavg.aspx>

126 <https://www.pmu.gov.in/index.aspx>

127 <https://saubhagya.gov.in/>

128 <https://csc.gov.in/>

129 <https://omms.nic.in/dbweb/Home/TimeSeries>

130 <https://pmjdy.gov.in/account>


131 <https://pmjdy.gov.in/account>

132 <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=2002012>

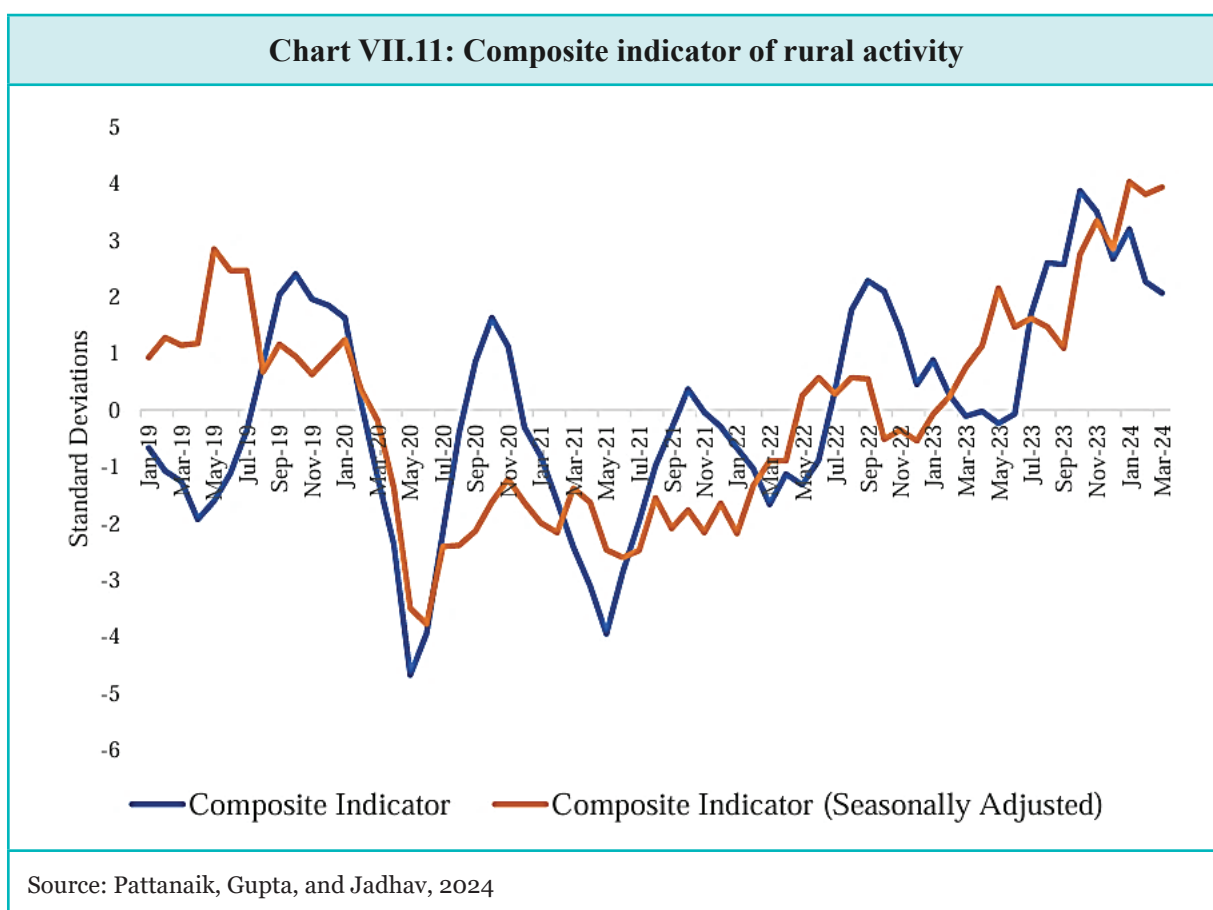
133 <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1990746>

134 <https://pmjdy.gov.in/account>

135 <https://egramswaraj.gov.in/pfmsDashboardNew.do>

<p>Health</p> 	<ul style="list-style-type: none"> • 1.58 lakh Sub Centres • 24,935 primary health centres • 5480 Community Health Centres • More than 1.6 lakh primary healthcare facilities upgraded to Ayushman Arogya Mandir¹³⁶(erstwhile AB-HWCs) (as of 13.12.2023)
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7.104 Rural demand has been rising in 2023-24, as seen in a composite indicator of rural activity¹³⁷ constructed by NABARD economists in a recent working paper (Pattanaik, Gupta, and Jadhav, 2024)¹³⁸. The index indicates that rural demand weakened during the COVID-19 waves and showed expansion during FY24. Normally, rural demand peaks every year in the immediate post-festival period of October and slackens before kharif sowing.



136 These Ayushman Arogya Mandir are designed to provide comprehensive primary healthcare services, including preventive, promotive, curative, palliative, and rehabilitative care, focusing on quality.

137 The composite indicator comprises thirteen high frequency indicators are used, namely, rural real wages, real agricultural credit, real agricultural exports (all deflated by CPI-rural), terms of trade (i.e., relative prices of food to non-food, sourced from the wholesale price index), rural employment in both agriculture and non-agriculture sector, rural consumer sentiment, MGNREGA demand, reservoir level, IIP-food, fertiliser sales, tractor sales, and two-wheeler sales.

138 Pattanaik, S., Gupta, N., and Jadhav, V., (2024): “Policy Insights from the Dynamic Interplay Between Rural Demand and Rural Inflation in India”, NABARD

Strengthening and modernising the safety net of MGNREGS

7.105 The Mahatma Gandhi National Rural Employment Guarantee Act 2005 (MGNREGA) aims at enhancing the livelihood security of households in rural areas of the country by providing at least 100 days of guaranteed wage employment in a financial year to every household whose adult members volunteer to do unskilled manual work.¹³⁹

7.106 The physical progress of MGNREGS (the Scheme through which MGNREGA is implemented) in terms of person-days generation, average person-days per household and participation of women is indicated below:

Table VII.8: Key indicators on MGNREGS

Indicator	2019-20	2020-21	2021-22	2022-23	2023-24*
Person-days generated (in crore)	265.4	389.1	363.3	293.8	309.2
Average person-days per household	48.4	51.52	50.1	47.8	52.1
Women participation rate (%age)	54.8	53.19	54.7	57.5	58.9
*As per MIS (as of 31.03.2024)					

7.107 Multiple efficiency reforms have been introduced to fully utilise the scheme. To ensure probity and elimination of leakages, geotagging before, during, and after the work is being done,¹⁴⁰ 99.9 per cent payments are through National Electronic Fund Management System, wages are transferred under DBT, Aadhaar-based payment has been enabled in 98.6 per cent of total Active workers, and Social Audit units have been set up in 28 states/UT.

7.108 While MGNREGS began as a wage employment scheme, it has evolved into an asset-creation programme for sustainable livelihood diversification, as seen in the rise in the share of individual beneficiary 'works on individual land' from 9.6 per cent of total completed works in FY14 to 73.3 per cent in FY24 (the share in terms of expenditure is much lower, yet rose from 6.1 per cent in FY14 to 32.1 per cent in FY22). Capacity development of workers is being promoted initiatives like Bare Foot Technicians (BFT)¹⁴¹ and UNNATI¹⁴² skilling project.

7.109 Further, in order to derive maximum impact from the scheme, it has been converged with various initiatives such as Nutri-Garden for individual beneficiaries and community in

139 Implemented by the Ministry of Rural Development from 2 February 2006, this Act initially covered 200 most backward districts of the country. It was implemented in an additional 130 districts in Phase II, during 2007-2008. The Act was notified in the remaining rural districts of the country from April 1, 2008 in Phase III

140 More than 5.73 crore assets have been geo-tagged (as of 31 March 2024) and made available in the public domain, since its launch in 2016.

141 So far, 9387 BFTs have been trained in 20 States.

142 The UNNATI skilling project aims to upskill MGNREGS workers by providing training to one adult member (of age 18-45 years) of a household who has completed 100 days of work under Mahatma Gandhi NREGA in the financial year from 2018-19. Full expenditures towards a stipend, against wage loss compensation, are entirely borne by the Central Government. This project was launched in FY20 and aims to enhance the skill base of 2 lakh Mahatma Gandhi NREGA beneficiaries in three years, i.e., FY20, FY21 and FY22. So far, about 59,350 candidates have been trained.

convergence with State Schemes and NRLM, fodder farms in convergence with the Department of Animal Husbandry and Dairying (DAHD), promotion of horticulture in convergence with Ministry of Agriculture and Farmer Welfare, promotion of medicinal plantation in convergence with National Medicinal Plantation Board, Ministry of Ayush, Construction of Gram Panchayat building in a mission mode in convergence with Ministry of Panchayati Raj, construction of community sanitary complexes in convergence with Swachh Bharat Mission (Grameen) – Phase – II, and construction of all-weather road connectivity to border areas in convergence with Border Roads Organisation (BRO), Ministry of Defence.

7.110 Box VII.9 examines whether spending on MGNREGS is an indicator of rural distress.

Box VII.9: Is MGNREGS spending an indicator of rural distress?

There is a marked variation in the performance of the MGNREGS across states. Multiple research studies^{143,144,145} have been conducted to find a definite cause for such unevenness in outcomes but a satisfactory explanation has not been found. Some reports^{146,147} suggest that MGNREGS demand is indicative of rural distress. If this is indeed the case then data trends should show that States with more poverty and higher unemployment rates use more Scheme funds and generate more employment person-days. Additionally, there might be a correlation between MGNREGS fund usage and reduced unemployment. MGNREGS wages could reflect state poverty levels. Past studies¹⁴⁸ have attempted to correlate MGNREGS demand with weather data to indicate real-time rural distress, but the hypothesis needs verification.

Insights from MGNREGS Data

Data for FY24¹⁴⁹ shows that although Tamil Nadu has less than 1 per cent of the country's poor population,¹⁵⁰ it accounted for nearly 15 per cent of all MGNREGS funds released. Similarly, Kerala, with only 0.1 per cent of the poor population, used almost 4 per cent of the Nation's MGNREGS funds. Together, these states generated 51 crore person-days of employment. In contrast, Bihar and UP, with about 45 per cent (20 per cent and 25 per cent respectively) of the poor population, accounted for only 17 per cent (6 per cent and 11 per cent respectively) of MGNREGA funds and generated 53 crore person-days of employment (Chart VII.12).

143 'An Evaluation of India's National Rural Employment Guarantee Act', World Bank, accessed 3 July 2024, <https://tinyurl.com/27farpke>

144 Sami, L. and Khan, A. (2016) 'Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA): A Tool for Employment Generation', *International Journal of Social Sciences and Management* 3: 281

145 Turangi, S. (2022): "MGNREGS Performance (2006–21): An Inter-State Analysis", *South Asia Research* 42, no. 2 (July 2022): 208–32, <https://doi.org/10.1177/02627280221085195>.

146 Nitaware, H., 7 July 2022, 'Demand of Record 30 million Jobs for MGNREGS Reflects Rural Distress', *Down to Earth*, accessed 5 July 2024, <https://tinyurl.com/3a2kj643>

147 Ghildiyal, S., 2 April 2022, 'Rural Distress: Despite Dip in 2021, NREGA Generates around 100 Crore Persondays More than Pre-Pandemic 2019', *The Times of India*, <https://tinyurl.com/884v5y5f>

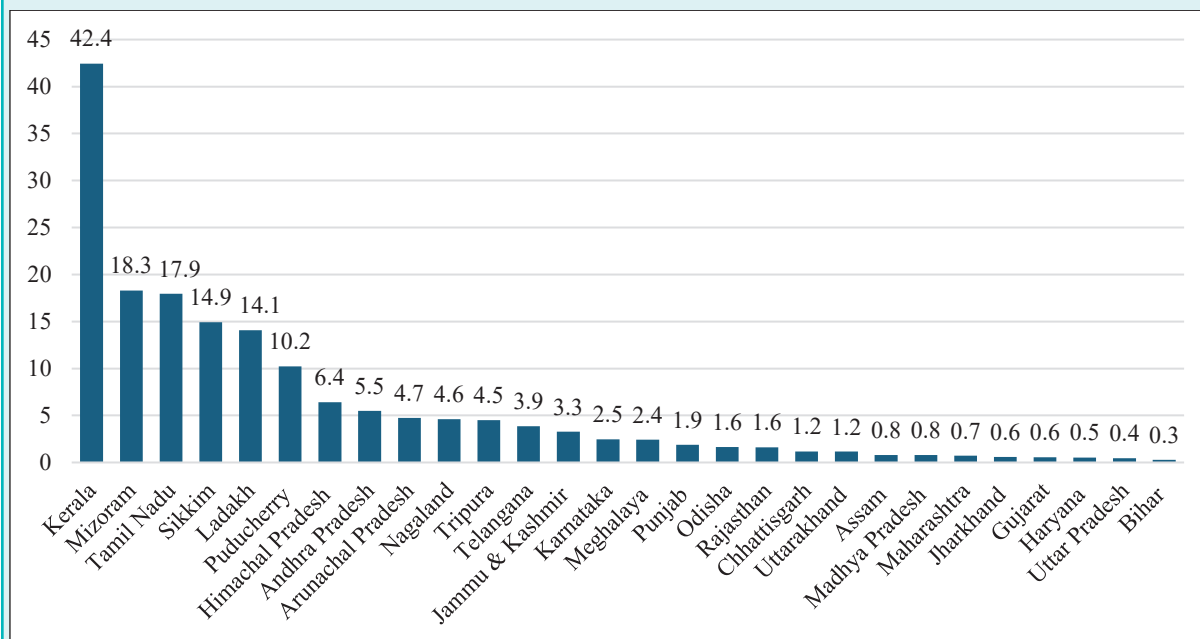
148 Shagun, 'Can MGNREGA Data Serve as Real-Time Index for Rural Distress?', *Down To Earth*, 29 July 2019, <https://tinyurl.com/5ewuhubx>

149 As per data from Department of Rural Development (DoRD) and NFHS-5.

150 Poor population figures calculated from Head Count Ratio (HCR) data from Niti Aayog MPI report.

The correlation coefficient between state-wise multidimensional poverty index and person-days generated is calculated to be only 0.3,¹⁵¹ indicating that MGNREGS fund usage and employment generation are not proportional to poverty levels.

Chart VII.12: Ratio of proportion of MGNREGS fund released to States and proportion of their Poor population¹⁵²



Source: DoRD, NFHS

Additionally, calculations reveal that there is little correlation between MGNREGS fund usage and rural unemployment rates. Data from FY23¹⁵³ shows that states with the highest rural unemployment rates did not necessarily use the most MGNREGS funds. Contrary to the popular narrative, the data does not support the idea that states with high rural unemployment rates in FY22 sought more MGNREGS funds in FY23 (Chart VII.13).

Under the MGNREGA, unless a national minimum wage is set (which the Act permits), states can set their own minimum wage. This fixation should ideally consider local employment opportunities, per-capita incomes, and alternate income sources. However, scheme data¹⁵⁴ reveals that minimum wage fixation is ad-hoc and not correlated with per-capita income or poverty headcount ratio. States such as Haryana, Kerala, Tamil Nadu, Karnataka, and others have relatively high notified wage rates in MGNREGA (Chart VII.14), relative to their per-capita incomes. This significantly impacts state-wise MGNREGS fund usage, as the wage component is fully borne by the Central Government.

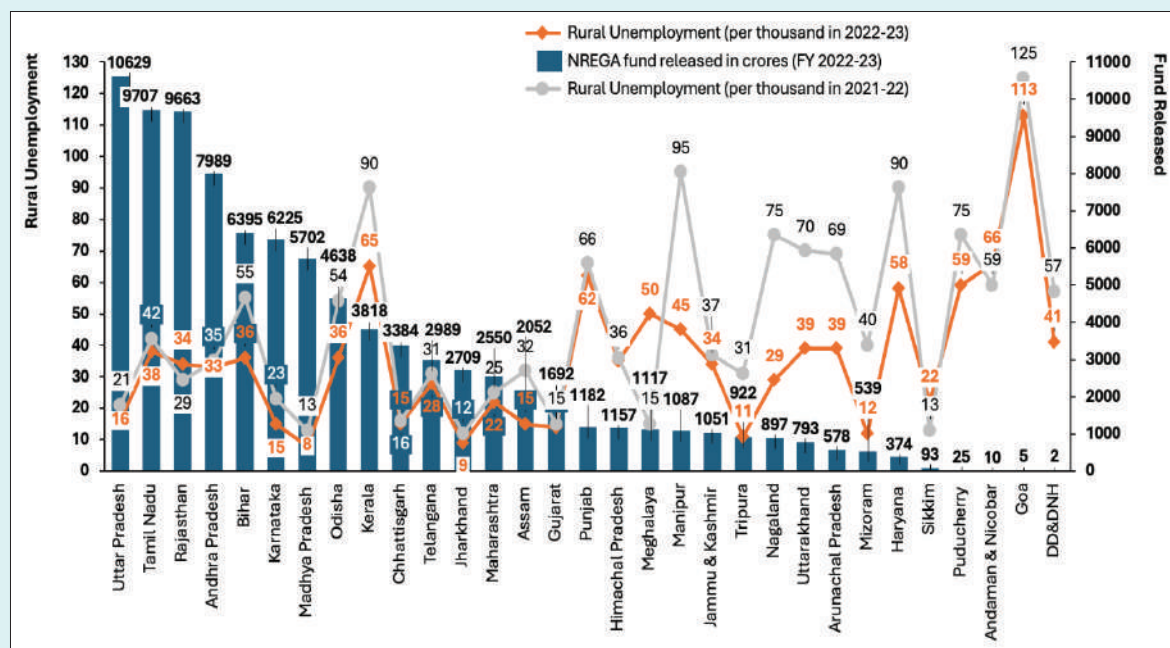
¹⁵¹ Own calculations. A coefficient of 1 would indicate that the poorer a state, greater the number of person-days it generates and a coefficient of 0 would indicate no relationship between poverty and person-days.

¹⁵² Data for West Bengal, Manipur, Lakshadweep, A&N, DD&DNH and Goa not included because no/negligible fund was released to these states/UTs for NREGS in FY24

¹⁵³ Fund release data from DoRD and unemployment data from RBI Handbook of Statistics on Indian States at <https://rbi.org.in/Scripts/PublicationsView.aspx?id=22079>

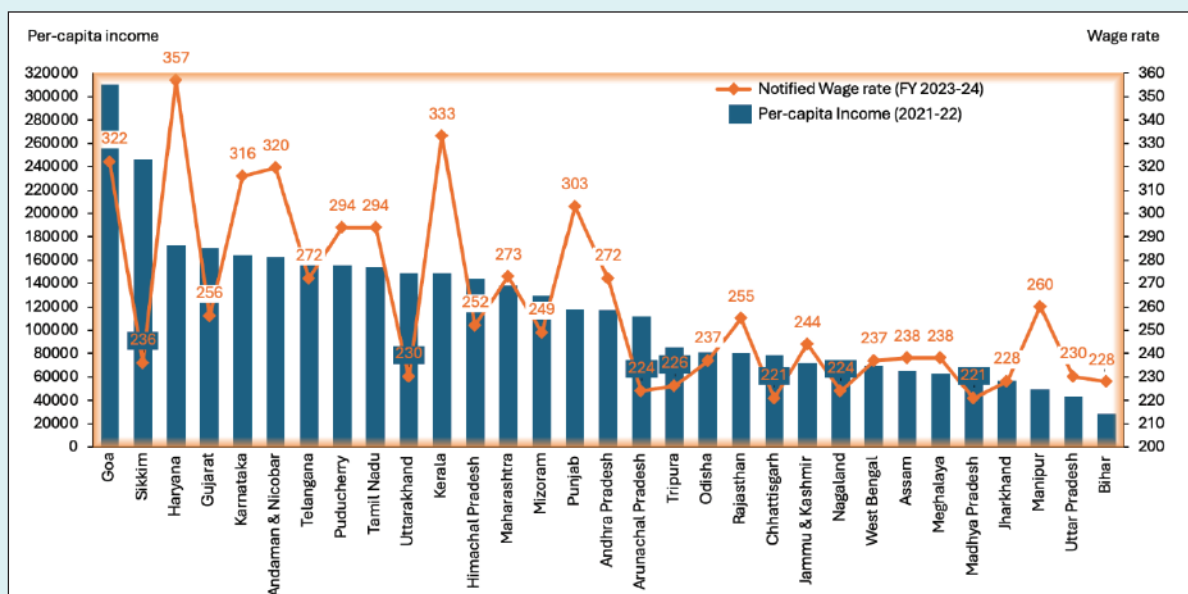
¹⁵⁴ Data from DoRD

Chart VII.13: Unemployment rate (per 1000) and MGNREGS fund released in FY23



Note: Employment figures are the sum of principal status and subsidiary status.
Source: DoRD, NSSO Employment & Unemployment Survey Reports; PLFS; NSO

Chart VII.14: Comparison of per-capita incomes and Notified wage rates



Note: - For HP, notified wage rate has been considered as the average of the wage rates notified for scheduled areas and non-scheduled areas
- For A&N, notified wage rate is considered as the average of the rates notified for Andamans and Nicobar

Diagnosis of the factors that explain differences in MGNREGA work demands across States

It is evident from the data above that MGNREGS work demand does not directly correlate with increased rural distress at a micro level. The remarkable evolution of MGNREGS work from being the last resort of village-resident families to becoming more of a smart choice for household asset creation and sustainable income generation has also been noted previously.¹⁵⁵ This indicates that other important aspects must be factored in to explain the State level differences in fund usage. Some of these are discussed below.

Supply-side issues

Difference in time taken by DoRD to release funds to different States- The automated process by DoRD ensures no significant variation in fund release times to different States, indicating that this is not a cause of state-wise differences in fund usage.

Appropriation of MGNREGA budget between states- Differences in MGNREGS fund usage could likely stem from projected annual demands in the agreed labour budgets. Projections¹⁵⁶ for FY25 show that states with a high rural poor population¹⁵⁷, like UP, MP, and Bihar, will have higher annual person-days. Thus, the variance is likely due to actual fund usage based on the work completed.

Demand-side issues

State's institutional capacity to tap benefits under the MGNREGS- To access MGNREGS funds, state governments must finalise labour budgets for the upcoming financial year in advance, following a bottom-up planning process. This includes Gram Panchayat meetings, approvals at Block and District levels, and compilation at the State level. States must utilize at least 75 per cent of the previous year's funds, provide utilisation certificates, expenditure statements, and social audit achievements to apply for fund tranches.¹⁵⁸ States with better institutional capacities and trained functionaries can complete this process on time.

Literature^{159,160,161} establishes a link between per-capita income and institutional quality. States with lower per-capita incomes and higher poverty levels often have weaker institutions, thereby tapping fewer funds per work executed and generating less employment per capita for the rural poor.¹⁶² FY24 data¹⁶³ shows that states like UP (~10 lakh works), Karnataka

155 Nageswaran, V.A. et.al 'Why We Must Re-Examine Narrative of Rural Distress', mint, 22 August 2022, <https://tinyurl.com/5n76hbfx>

156 Person-days employment data as furnished by DoRD.

157 Rural Population data based on RBI's Handbook of Statistics on Indian Economy 2021-22- <https://rbi.org.in/Scripts/PublicationsView.aspx?id=21248>.

158 Detailed guidelines in Annual Master Circular 2024-25 (<https://tinyurl.com/2msf4fpf>).

159 Alonso, J.A., Garcimartin, C. and Kvedaras, V. (2020): "Determinants of Institutional Quality: An Empirical Exploration", *Journal of Economic Policy Reform* 23, no. 2 (2 April 2020): 229–47

160 Rodrik, D., Subramanian, A. and Trebbi, F. (2004): "Institutions Rule: The Primacy of Institutions Over Geography and Integration in Economic Development", *Journal of Economic Growth* 9, no. 2 (2004): 131–65.

161 Acemoglu, D., Johnson, S. and Robinson, J.A. (2001): "The Colonial Origins of Comparative Development: An Empirical Investigation", *American Economic Review* 91, no. 5 (December 2001): 1369–1401

162 Rural poor population data is taken from RBI Handbook of Statistics on Indian Economy 2021-22-<https://rbi.org.in/Scripts/PublicationsView.aspx?id=21248>

163 Data on number and category of works and fund usage as furnished by DoRD

(~9 lakh works), and MP (~7.77 lakh works) executed many works but used fewer MGNREGA funds per work (₹0.93 lakh, ₹0.55 lakh and ₹0.72 lakhs respectively). Conversely, states like Puducherry (₹8.96 lakh per work), Haryana (₹. 4.89 lakh), Rajasthan (₹2.76 lakh), and Tamil Nadu (₹2 lakh) tapped more funds per work.

The trend is similar for person-days employment generated per capita of the rural poor, with Tamil Nadu (69), Kerala (62), Rajasthan (42), and Puducherry (30) outperforming UP (7), MP (10), and Bihar (6). States with higher institutional capacities plan and coordinate better, executing costlier works in rural infrastructure or natural resources management. In contrast, lower-income states like Assam, Jharkhand, Bihar, UP, Chhattisgarh, MP, and Rajasthan have a higher proportion of “individual works”¹⁶⁴ (50 per cent or more), which are less costly and require less planning.

Thus, a state’s institutional capacity is crucial for effectively tapping MGNREGS funds.

Differences in registering demand- Despite provisions mandating State governments to grant unemployment allowance if work is not provided within 15 days, only ₹90,000 was released in FY 24 and ₹7.8 lakh in FY23 across all states.¹⁶⁵ Further, evaluation reports¹⁶⁶ indicate that employment was often unavailable when sought. This suggests that block-level functionaries may not register demand in real time. Consequently, formal data showing MGNREGS work demand may not reflect the true demand and current rural economic distress. This also indicates that work demanded is only reported on the portal when employment is actually provided (*presumably to save on the State Government’s liability towards unemployment allowance*). Hence work demanded on the portal is de-facto equivalent to work provided and not the “real” demand.

Increased leakages- Variations in MGNREGS fund usage arise from irregularities and leakages observed across states. Despite lacking exhaustive documentation, news reports¹⁶⁷, social audits¹⁶⁸ and anecdotal evidence suggests that funds often do not reach intended beneficiaries, making demand an unreliable distress indicator. Over four years, Social Audit Units found ₹935 crore misappropriated under MGNREGS. Instances of workers paying contractors and giving up job cards¹⁶⁹; illegal use of machines instead of labour, unrealistic labour budgets, delays in fund release¹⁷⁰, lack of job card updates and unverified bills have been reported from different regions. The Social Accountability Forum’s audit¹⁷¹ reported ₹658 crore misappropriated over 2018-20, with grievances focusing on wage issues, job cards, and worksites. It also noted that transparency, accountability, and record-keeping processes were often violated in MGNREGA implementation.

164 Data on category of works as furnished by DoRD- these include individual, and community works for vulnerable sections

165 Unemployment allowance data furnished by DoRD.

166 ‘An Evaluation of India’s National Rural Employment Guarantee Act’.

167 Singh, S., 2 October 2023, The Hindu ‘RTI Queries Reveal Several Irregularities in MGNREGA Scheme in West Bengal’

168 Nitnaware, H., 24 January 2023, “MGNREGA Graft: Social Audit Finds Irregularities Worth Rs 54 Lakh in Rajasthan” Down to Earth accessed 24 June 2024, <https://tinyurl.com/3bnjv3r>

169 Bhattacharyya, D. (2023): “Of Conflict and Collaboration”, Economic and Political Weekly’, Vol 58, Issue no. 36, 9 September 2023, <https://www.epw.in/journal/2023/36/special-articles/conflict-and-collaboration.html>.

170 ‘Audit Reports | Comptroller and Auditor General of India’, <https://cag.gov.in/en/audit-report/details/118182>.

171 Social Accountability Forum for Action and Research, ‘MGNREGA Social Audit Report’, November 2020.

From the above diagnostic analysis, it can be concluded that demand under MGNREGS is not a real indicator of rural distress but is rather predominantly linked with the State's institutional capacity and to some extent also different minimum wages and other considerations.

Nurturing rural entrepreneurship at the grassroots

7.111 The Government has implemented a bouquet of vibrant schematic interventions with a distinct focus on seamless access to affordable finance and generating lucrative market opportunities that ultimately aim to provide a fillip to rural entrepreneurship. The Government remains committed to bolstering rural entrepreneurship and has been at the forefront of implementing a plethora of schemes aimed at livelihood generation, providing easy access to finance and marketing, and developing a common infrastructure for promoting rural entrepreneurship. Some of the schemes and programmes are mentioned in Box VII.10 below.

Box VII.10: Initiatives fostering rural entrepreneurship

(a) Deendayal Antyodaya Yojana- National Rural Livelihood Mission (DAY-NRLM), for instance, is one of the world's largest social sector schemes aiming to empower poor households to access meaningful self-employment and skilled wage employment opportunities. DAY-NRLM has helped women access scientific knowledge, specialised skills, and valuable exposure to motivate and ignite new energy to reform their livelihoods and venture into new activities. They have taken up enterprises like solar panels to prepare sanitary pads, soaps, detergents, face masks, sanitisers, fencing materials, etc. Initiated in 2011, the Mission has its footprint across 7135 blocks in 742 districts of 28 states and 6 UTs. The progress of the programme on key components has been summarised below.

Progress under DAY-NRLM

Indicator	Cumulative progress (Up to June 2024)
No. of Blocks covered	7135
No. of SHGs promoted (in lakh)	90.86
No. of Households mobilised (in crore)	10.05
Capitalisation Support provided to SHGs (in ₹ crore)	43,610
Amt. of Bank credit accessed by SHGs (in ₹ lakh crore)	8.85
No. of individual enterprises set up under SVEP (in lakh)	2.98
No. of vehicles deployed under AGEY	2333
No. of <i>Mahila Kisan</i> covered (in crore)	3.71
No. of Custom Hiring Centres established	32709
No. of household saving kitchen garden (in crore)	2.28
Source: Ministry of Rural Development	

(b) Lakhpati Didis initiative

The *Lakhpati Didis* initiative, launched in 2023, targets to uplift three crore SHG households to a minimum annual income of ₹1 lakh within three years. It focuses on diversified livelihood activities, district-level planning, household support, Government department convergence, and capacity building of staff and community members.

(c) Saras Aajeevika portal and eSARAS mobile App (launched in 2023) showcase a wide array of authentic handcrafted products, such as linen items, furniture, apparel, pickles, etc., made by SHGs. By creating a dedicated marketplace for their indigenously crafted products, the platform thus catalyses rural women into new-age entrepreneurs.

(d) Start-Up Village Entrepreneurship Programme (SVEP) and Aajeevika Grameen Express Yojana (AGEY) are being implemented as non-farm livelihood strategies under DAY-NRLM. SVEP supports entrepreneurs in rural areas in setting up local enterprises. The strategy is to promote knowledge about business feasibility management, provide start-up loan finance access, and scale up the existing enterprise. 2.97 lakh enterprises have been formed in 221 blocks of 29 states/UT. AGEY provides safe, affordable and community-monitored transport services to rural areas. Around 2333 vehicles are operational in 26 states, providing transport services to connect remote rural villages.

(e) The Rural Self Employment Training Institute (RSETI) scheme, which is a sub-scheme of the NRLM, is also aimed at strengthening rural entrepreneurship. RSETIs are essentially district-level Self Employment Training Institutes in rural areas managed by the banks and funded by the Ministry of Rural Development. They provide free-of-cost skill training, credit assistance, and mentorship to rural unemployed youth aged 18-45 years, with an approach of short-term training & long-term hand-holding of entrepreneurs. Their tailor-made curriculum is designed to match the local demands of the agricultural economy and small rural businesses. Since the scheme's inception in 2009, 50.72 lakh candidates have been trained, and 36.23 lakh candidates have been settled as entrepreneurs/apprentices till June 2024, with a settlement rate of more than 72 per cent.

(f) Financing rural entrepreneurship: To support rural entrepreneurs, the National Bank for Agriculture and Rural Development (NABARD) promotes Micro Entrepreneurship Development Programmes (MEDPs) and Livelihood & Enterprise Development Programmes (LEDPs), focusing on funding and skill improvement. NABARD backs SHGs, JLGs, POs, and Micro-entrepreneurs with training and helps them sell their products on online platforms and the Open Network for Digital Commerce (ONDC). Additionally, Off-Farm Producer Organisations (OFPOs) receive guidance to join ONDC. By 31 March 2023, around 5.85 lakh SHG members benefitted from 20,174 MEDPs, receiving ₹52.39 crore in grants, and 2.67 lakh SHG members from 2149 LEDPs, with ₹106.10 crore in grants.

(g) The ‘**SARAS Mela**’ by the Ministry of Rural Development helps SHG beneficiaries sell their products directly in urban markets, eliminating middlemen and improving artisans’ margins. It allows rural producers to engage with buyers, tailor products to consumer preferences, and hone their marketing skills.

(h) Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY): DDU-GKY is a state-led, outcome-driven skilling program focused on rural youth, emphasizing sustainable employment, PPP, and independent third-party certification of outcomes through Sector Skill Councils. The programme occupies a unique position amongst other skill training programmes due to its focus on the poor rural youth and its emphasis on sustainable employment through the prominence and incentives given to post-placement tracking, retention and career progression. Special sub-schemes called ROSHNI and Himayat are also being implemented. A total of 16.5 lakh candidates have been trained, and 10.48 lakh candidates placed under the scheme till June 2024 (provisional).

7.112 Looking forward, the wide local presence of RSETIs (591 RSETIs functioning across 577 districts of the country¹⁷²) and tri-partnership of banks, state Governments, and the central Government can be leveraged to converge efforts across Government programmes such as skilling and livelihood diversification, farm mechanisation through Krishi Vigyan Kendra, job fairs, SHGs, farmer producer organisations, primary agricultural cooperative societies etc. By acting as the fulcrum of skill and credit linkage at the grassroots, RSETIs can thus emerge as district-level enterprise hubs.¹⁷³

7.113 The potential of SHGs needs to be tapped by enabling their upscaling into larger enterprises, harnessing professional support and management. For instance, the mobilisation of tribal women into operating, managing, and owning solar lamp factories and retail solar shops in Dungarpur, Rajasthan, was made possible through handholding by Prof. Chetan Solanki of IIT Bombay and support by the Ministry of New and Renewable Energy, and local administration.¹⁷⁴ With proper training and professional guidance, women’s collectives can emerge as self-sustainable enterprises at scale.

Rural Governance: A story of digital transformations at the grassroots

7.114 Rural development has immense benefits to derive from better rural governance, which can serve as the foundation and multiplier force for both programme-led impact creation and individual-led utilisation of rising opportunities. With a 200 per cent increase in rural internet subscriptions between 2015 and 2021¹⁷⁵, digitisation of governance is a low-hanging fruit to reduce the distance between the village and the administrative headquarters, which is crucial

172 PIB release ID 1983115, 6 December 2023 <https://tinyurl.com/4e68kcjr>

173 Sinha, A. (2023): “The Last Mile: Turning Public Policy Upside Down”, 1st edition. Routledge India. Chapter 11, Revisiting Skills for Full Employment

174 <http://durgaenergy.com/About>.

175 Economic Survey 2022-23, Chapter 12, Physical and Digital Infrastructure: Lifting Potential Growth.

in regional development.¹⁷⁶ In this aspect, multiple digitisation initiatives have been unfolding in rural India.

Box VII.11: Digitisation initiatives to improve rural governance

e-Panchayat Mission Mode Project

The e-Panchayat project seeks to automate the internal workflow processes of approximately 2.71 lakh Panchayats or equivalent bodies, benefiting around 30 lakh elected members and about ten lakh PRI functionaries. In addition, the Government has introduced an application called AuditOnline under the e-Panchayat Mission Mode Project to facilitate online audits of Panchayat accounts and maintain detailed records of internal and external audits.¹⁷⁷

e-Gram SWARAJ

On National Panchayati Raj Day on 24 April 2020, e-Gram SWARAJ (<https://egramswaraj.gov.in/>) was launched to introduce digital Panchayats for rural India. The platform provides a complete profile of the Gram Panchayat, including demographic details, finances, and activities outlined in the Gram Panchayat Development Plan (GPDP). It also integrates with the Public Financial Management System (PFMS) to enable real-time payments and better financial management. 2.52 lakh Gram Panchayats have prepared and uploaded their GPDPs for FY24 on e-Gram SWARAJ.¹⁷⁸

Bhu-Aadhaar

The Identification Parcel Number (ULPIN) or Bhu-Aadhaar is a 14-digit identification number assigned to a land parcel based on its longitude and latitude coordinates. It aims to facilitate demarcation, identification, and standardisation of land parcels, enabling different Government departments to provide land-related services to citizens, including multi-departmental services. Proper land statistics and land accounting through ULPIN would help develop land banks and an Integrated Land Information Management System (ILIMS). ULPIN has been rolled out in 29 states, generating approximately 14.94 crore ULPINs.¹⁷⁹

SVAMITVA Scheme

SVAMITVA (Survey of Villages and Mapping with Improved Technology in Village Areas) is a Central Sector Scheme launched in 2020 to provide the 'Record of Rights' to rural household owners. It aims to enable property monetization, reduce disputes, and facilitate comprehensive village-level planning. The drone survey has been completed in 2.90 lakh villages and 1.66 crore property cards have been prepared for 1.06 lakh villages. The scheme has been implemented in Haryana, Uttarakhand, Puducherry, Andaman and Nicobar Islands, and Goa.¹⁸⁰

¹⁷⁶ Asher, S., Nagpal, K., Novosad, P. (2018): "The Cost of Distance: Geography and Governance in Rural India", World Bank Working Paper, 2018.

¹⁷⁷ As per inputs from M/o Panchayati Raj, Government of India.

¹⁷⁸ Ibid.

¹⁷⁹ Ibid.

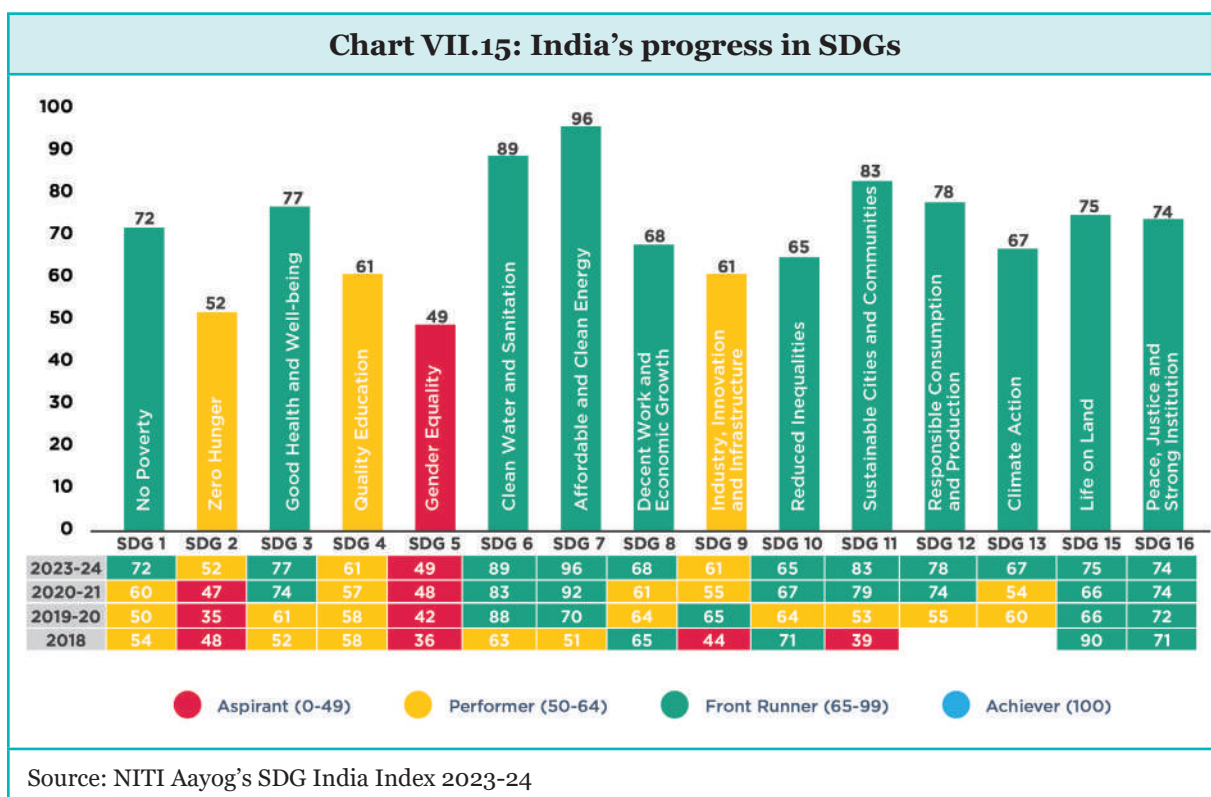
¹⁸⁰ PIB release dated 6 January 2024, Release ID: 1993736 <https://pib.gov.in/PressReleasePage.aspx?PRID=1993736>

TOWARDS SUSTAINABLE DEVELOPMENT

7.115 With less than six years remaining for achieving the Sustainable Development Goals (SDGs), the Government of India has been at the forefront in embracing, adopting, and championing the SDGs to improve the welfare and quality of life for its citizens. Despite the global economy facing multiple headwinds, India has made steady progress towards achieving the 2030 Agenda, showcasing the nation's resilience and commitment to SDGs. According to the progress report on SDGs by NITI Aayog through the SDG India Index, India has significantly improved in meeting these goals despite global challenges. Targeted interventions such as Pradhan Mantri Awas Yojana, Ujjwala Yojana, Swachh Bharat Abhiyan, Jan Dhan Yojana, Ayushman Bharat-PMJAY, Ayushman Arogya Mandir, PM-Mudra Yojana, Saubhagya, and Start-up India have had significant impacts and led to rapid improvements.

7.116 India's progress in achieving SDGs has advanced with each year. The performance is measured for 16 quantifiable goals, and a qualitative assessment is provided for Goal 17. The country's overall score/composite score¹⁸¹ measured by the SDG India Index has ascended from 57 in 2018 to 60 in 2019-20, 66 in 2020-21 to 71 in 2023-24. India has taken significant strides in accelerating progress on the SDGs between the 2020-21 and 2023-24 editions of the Index.

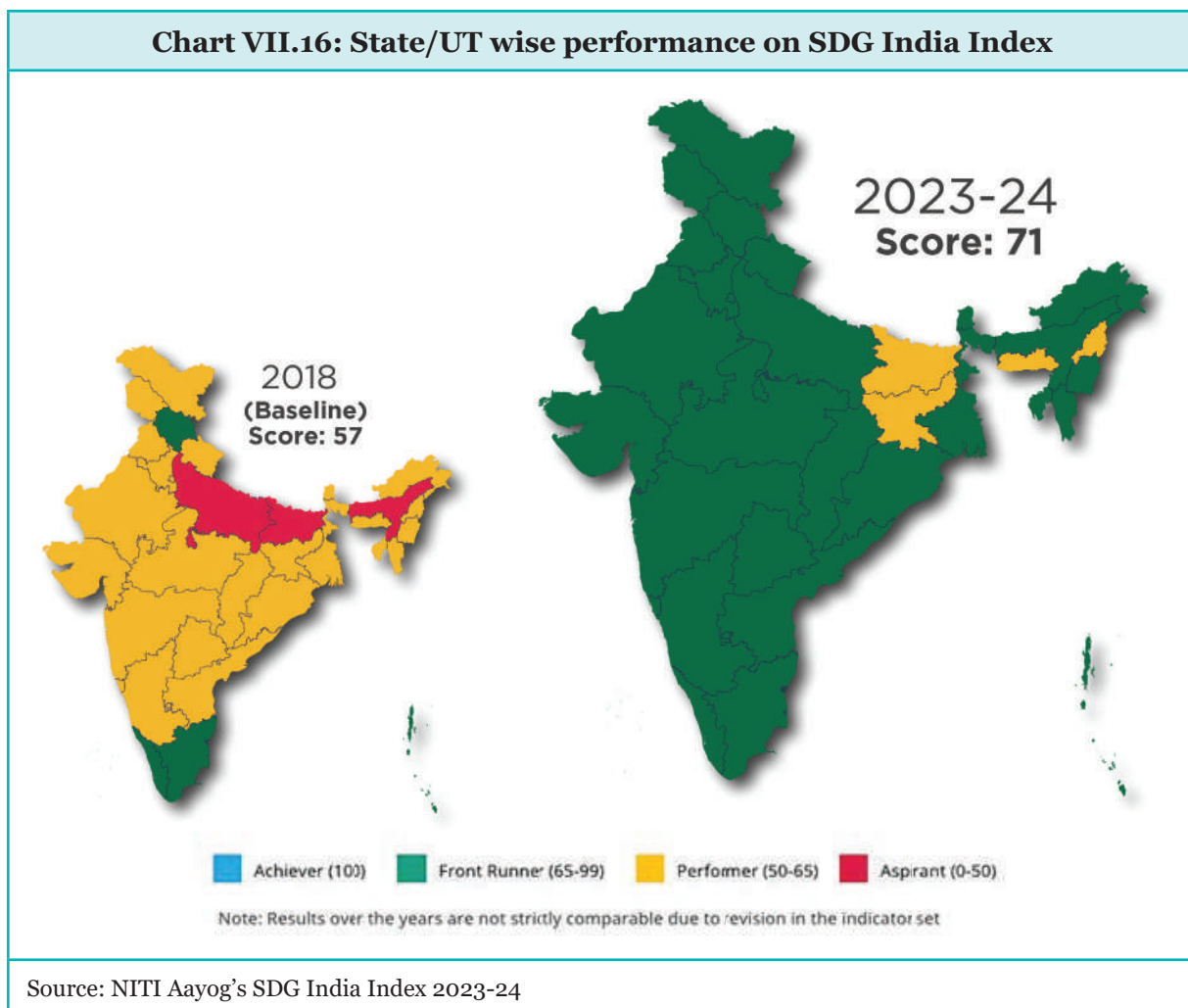
7.117 Since 2018, India has witnessed substantial progress in several key SDGs. Significant progress has been made in Goals 1 (No Poverty), 3 (Good Health and Well-being), 6 (Clean Water and Sanitation), 7 (Affordable and Clean Energy), 9 (Industry, Innovation and Infrastructure) and 11 (Sustainable Cities and Communities) (Chart VII.15).



¹⁸¹ The composite score is the arithmetic mean of the Goal score for 16 Goals, for each State/UT, assigning equal weight to each Goal.

Performance of States and UTs on the NITI Aayog SDG India Index, 2023-24

7.118 The SDG India Index 2023-24 reports a positive trend in the performance of States and UTs in their SDG journey. The scores for States now range from 57 to 79, while UTs score between 65 and 77. This year, 32 States/UTs have scored between 65 and 99, up from 22 in the 2020-21 edition.



7.119 Notably, there are 10 new States and UTs in the Front Runner category. These include Arunachal Pradesh, Assam, Chhattisgarh, Madhya Pradesh, Manipur, Odisha, Rajasthan, Uttar Pradesh, West Bengal, and Dadra and Nagar Haveli and Daman and Diu. The SDG India Index 2023-24 demonstrates the increase in composite scores across all States, with improvements ranging from 1 to 8 points.

7.120 Between 2018 and 2023-24, fastest moving States are Uttar Pradesh (increase in score by 25), followed by J&K (21), Uttarakhand (19), Sikkim (18), Haryana (17), Assam, Tripura and Punjab (16 each), Madhya Pradesh and Odisha (15 each).

CONCLUSION AND WAY FORWARD

7.121 The Indian economy is moving forward with a reformed approach to welfare, focused on empowerment, efficiency in the delivery of services, and participation of the private sector and civil society. In terms of outreach, the saturation of basic necessities has been recognised as the first step to productive participation of every citizen in the economy, imperative for sustained medium-term growth. In terms of efficiency, the digitisation of healthcare, education and governance is a force multiplier for every rupee spent on a welfare programme.

7.122 The education sector is bustling with the across-the-board transformation led by the NEP 2020, which is expected to yield Foundational Literacy And Numeracy for every child passing the third standard in the near future. That said, improving learning outcomes and undoing the COVID-induced learning loss is more urgent than ever. In healthcare, Ayushman Bharat is not only saving lives but also saving generations from the trap of debt. The challenge of ensuring mental health and well-being is intrinsically and economically valuable. In the age of social media and ‘the great rewiring of childhood’, this challenge must be met together with destigmatisation, community participation, and fortification of specialised human resources.

7.123 Women-led development is emanating from their social, economic, and political empowerment, occurring through a constructive intermingling of policy and social change. Nevertheless, much scope remains to enhance asset ownership among women, with significant intrinsic and instrumental gains of fairness and economy to be secured.

7.124 Better quality of life in the hinterland is being reinforced by a host of enabling programmes. The self-help movement has come far in terms of its outreach, and the social capital stands to gain from professional assistance in marketing and management. To provide a fillip to rural enterprises, RSETI can be utilised as district hubs of skill development and enterprise.

7.125 Further, a scheme, however well-designed and noble in its formulation, is only as good as its implementation. It is the governance and unity of purpose at all levels of Government which is the keystone to the success of a social programme. To maximise this efficiency of translating spending into outcomes, many channels at the ground level will have to be unclogged.

7.126 At the heart of economic development lies human development, which is both the means and ends of the former. Unswerving in its commitment, India has a lot to be content about and a lot to be impatient for.

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EMPLOYMENT AND SKILL DEVELOPMENT: TOWARDS QUALITY

08

CHAPTER

Indian labour market indicators have improved in the last six years, as per the Periodic Labour Force Survey data, with the unemployment rate declining to 3.2 per cent in 2022-23. Rising youth and female participation in the workforce present an opportunity to tap the demographic and gender dividend. The factory employment data exhibits the bounce-back of the organised manufacturing sector in FY22, with continued rise in employment and the upscaling of factories. The net payroll additions under EPFO have more than doubled in the past five years, signalling healthy growth in formal employment. With artificial intelligence taking roots in several spheres of economic activity, job market must adapt while steering the technological choices towards collective welfare is key. To generate and sustain quality employment, agro-processing and care economy are two promising candidates, the latter also being a necessity for levelling the playing field for women in labour market. The fillip to skilling has yielded progress while there remains scope for more, as only 4.4 per cent of young workforce is formally skilled. Many regulatory clean-ups pose as low-hanging fruits of employment generation, including multiple state-level laws relating to use of land, sectors restricted for women workers, and apprenticeship promotion.

INTRODUCTION

8.1 Employment is the crucial link between growth and prosperity, and its quantity and quality determine the extent to which economic output translates into better quality of life for the population. To foster employment is to oil the engine of demand-led growth, kept running by a populace progressively less dependent on the Government for its dignified survival and sustenance. Generation of suitable employment opportunities, commensurate with the legitimate aspirations of India's youth, is also necessary to reap the country's once-in-a-lifetime demographic dividend.

8.2 This chapter explores various aspects of employment and skill development in the country. The first section dwells on the employment situation in the country, specifically focussing on women and youth employment. The structural transformation of the workforce and the trend

in factory employment are discussed, besides additions to EPFO's payroll and trend in rural wages. It also presents a bird's eye view of the government programmes to facilitate employment generation and promote labour welfare. The second section looks at the new forces shaping the labour market, including Artificial Intelligence (AI), gig work, climate change, etc. this is followed by an in-house simple estimation of the annual rise in job creation required to cater to the expanding working age population, rising female participation in labour force, and labour shifting out of agriculture. Next, agro-processing sector is proposed as a fertile sector for job creation in a pragmatic and decentralised manner. The next section discusses the felt need of a well-developed care economy, key to supporting workforce participation by women, and cater to an ageing population. The final section presents details of the country's skilling infrastructure and the outcomes of policies in enhancing skilling for employability.

CURRENT EMPLOYMENT SCENARIO

8.3 Over the past decade, India has witnessed a notable transformation in its employment landscape, marked by several positive trends contributing to economic growth and social development. This evolution is a result of various factors, including economic reforms, technological advancements, and an emphasis on skill development. The slew of structural reforms promoting ease of doing business, undertaken in the last decade and ongoing, remain crucial for productive employment generation in the current decade.

8.4 According to the annual Periodic Labour Force Survey (PLFS) by the National Statistical Organisation, Ministry of Statistics and Programme Implementation (MoSPI), the all-India annual unemployment rate (UR)¹ (persons aged 15 years and above, as per usual status²) has been witnessing a declining trend since the COVID-19 pandemic. This has been accompanied by a rise in the labour force participation rate (LFPR)³ and worker-to-population ratio (WPR)⁴. Even by the relatively strict standards of current weekly status (CWS)⁵, employment has recovered from the pandemic in urban and rural areas.

8.5 The quarterly PLFS reports for urban areas enable a more updated picture of employment. The quarterly urban unemployment rate for people aged 15 years and above declined to 6.7 per cent in the quarter ending March 2024 from 6.8 per cent in the corresponding quarter of the previous year, accompanied by a rise in the WPR and LFPR (Chart VIII.2).

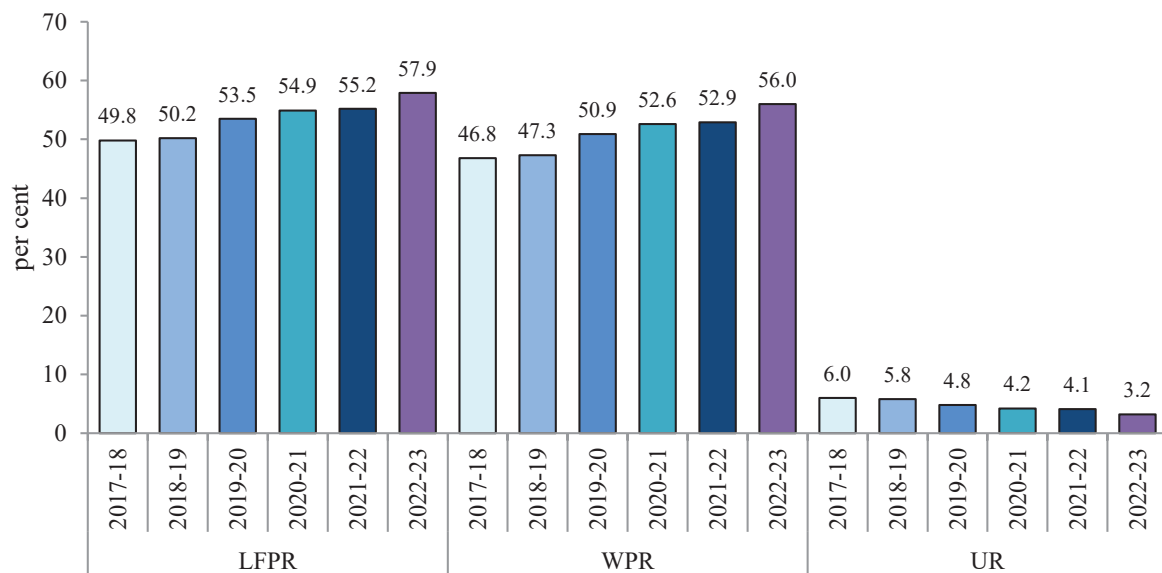
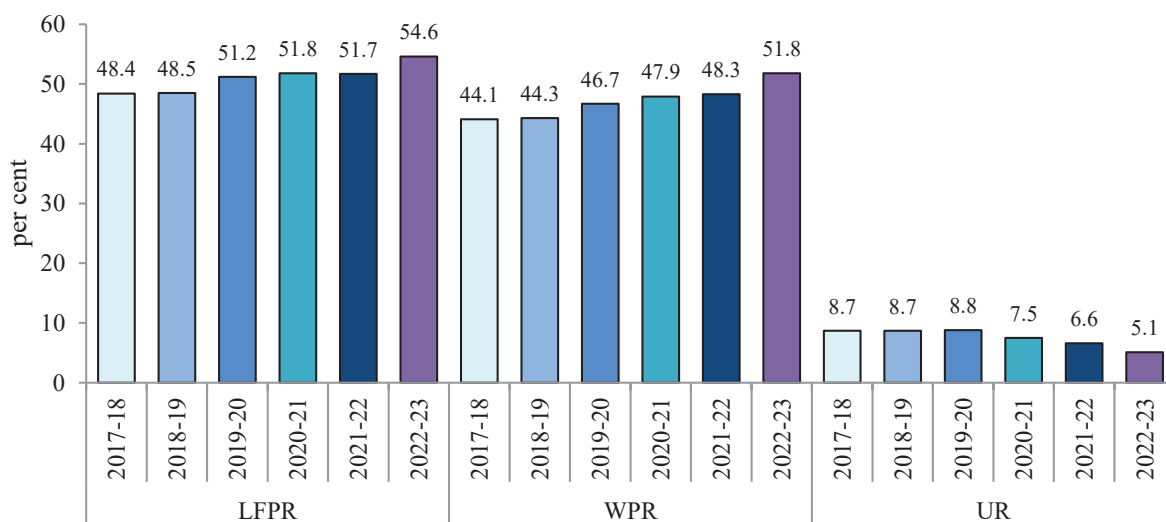
1 UR is defined as the percentage of unemployed persons in the labour force.

2 For a person to be categorised as employed as per usual status (ps+ss), he/she must have pursued an economic activity for at least 30 days during the 365 days preceding the date of the survey.

3 According to the PLFS, LFPR is the percentage of working-age population engaged in work or making tangible efforts to seek 'work' or being available for 'work' if it is available. 'Work' includes self-employment (subsistence agriculture and collection of firewood, poultry farming, etc., for self-consumption), regular wage/salaried employment, and casual labour.

4 WPR is defined as the percentage of employed persons in the total population.

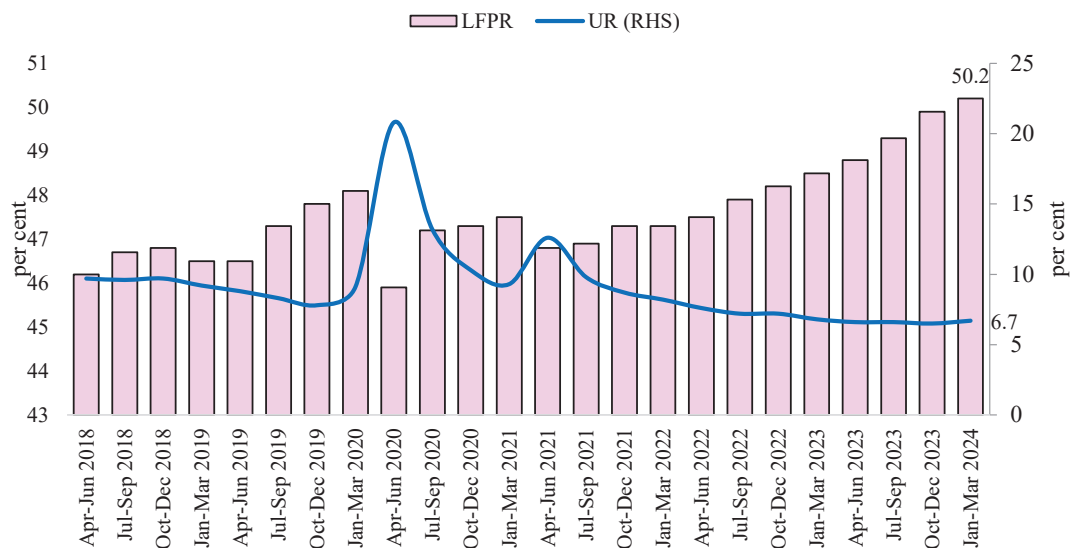
5 In the case of CWS, the activity status is determined on the basis of a reference period of the last 7 days preceding the date of the survey

Chart VIII.1: Improving annual labour market indicators (July-June period)
(a) Usual status, aged 15 years and above

(b) Current Weekly status, aged 15 years and above


Source: PLFS, MoSPI

Note: Figures for ages 15 years and above, the period of the survey for 2022-23 is July 2023 to June 2024, and likewise for other years.

Chart VIII.2: Declining quarterly urban unemployment rate

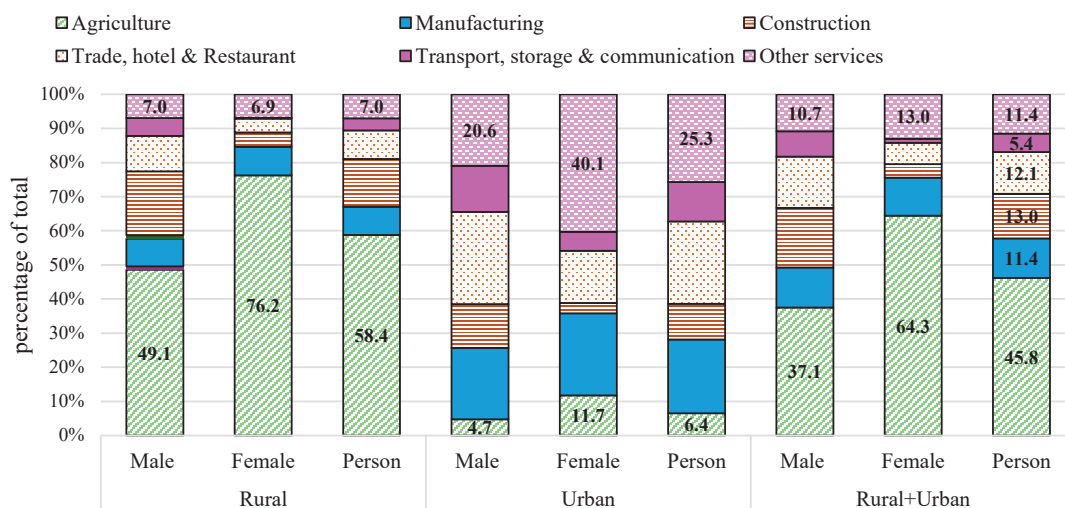


Source: Quarterly PLFS, MoSPI

Note: Figures for Current Weekly Status, 15 years and above

8.6 India’s workforce is estimated to be nearly 56.5 crore in 2022-23 using WPR from PLFS and MoHFW’s population projections. According to PLFS, more than 45 per cent of the workforce is employed in agriculture, 11.4 per cent in manufacturing, 28.9 per cent in services, and 13.0 per cent is in construction. The predominance of agriculture in the providing employment to nearly half of the population, especially females, is both a challenge and an opportunity, as explained in the section on agro-processing in this chapter.

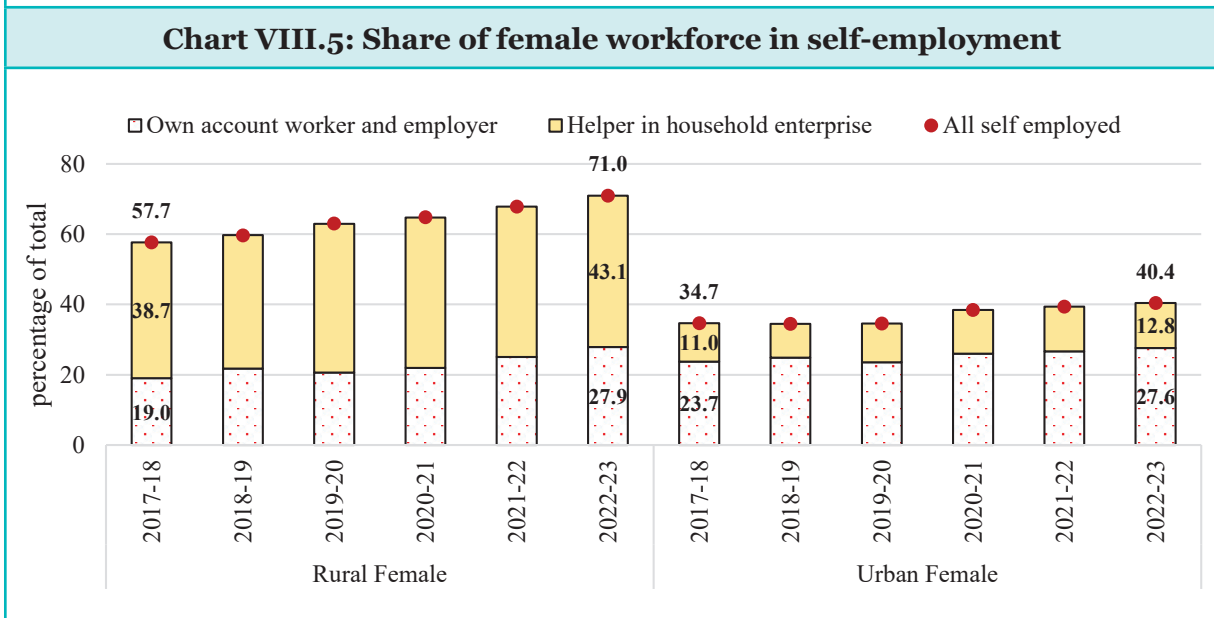
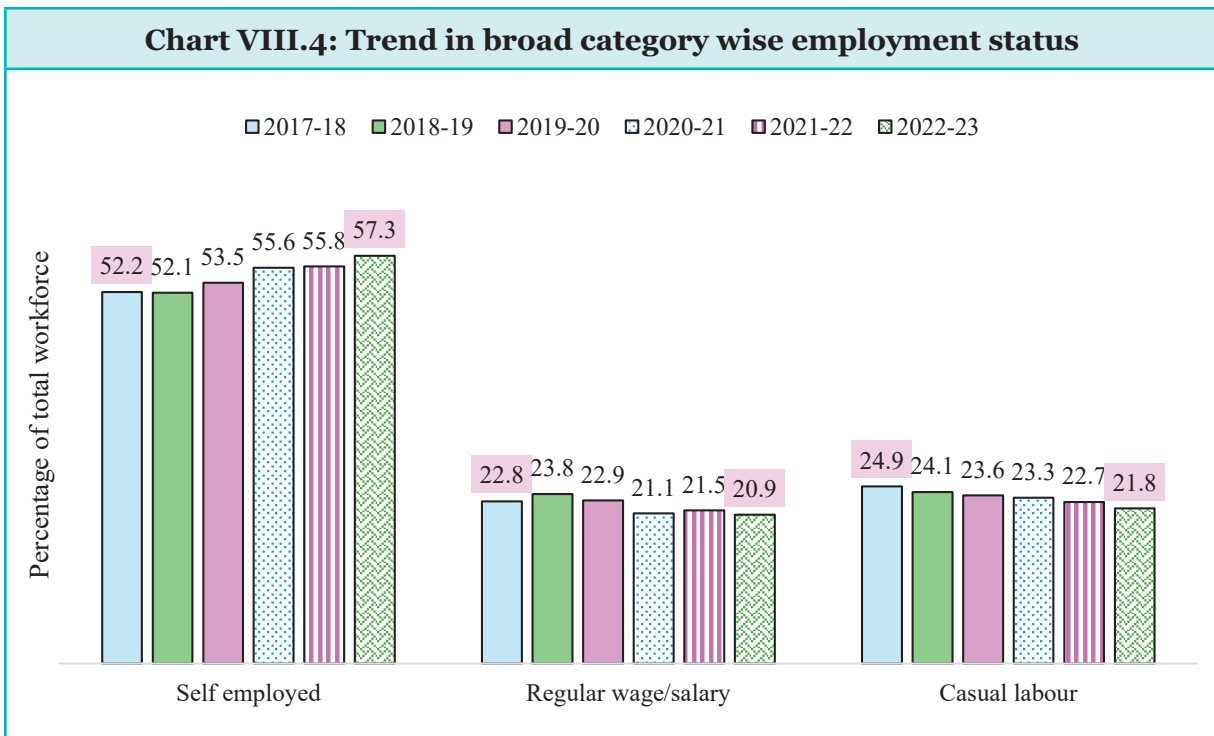
Chart VIII.3: Distribution of workers by broad industry divisions, 2022-23



Source: Annual PLFS report 2022-23, MoSPI

Note: The ‘other services’ category includes activities belonging to publishing, consultancy services, information services, financial and insurance services, real estate, legal and accounting, advertising, health and education services, tours and travels, arts, entertainment and recreation, etc.

8.7 In terms of employment status of workers, 57.3 per cent of the total workforce is self-employed, and 18.3 per cent is working as unpaid workers in household enterprises. Casual labour comprises 21.8 per cent of the total workforce and regular wage/salaried workers are 20.9 per cent of the total workforce. Gender-wise, it is the female workforce, which is shifting to self-employment, while the male workforce's share has been stable. This is evident in the sharp rise in female LFPR in the past six years (discussed in later in this chapter), driven by rural women joining agriculture and related activities.



Source: Annual PLFS reports, MoSPI

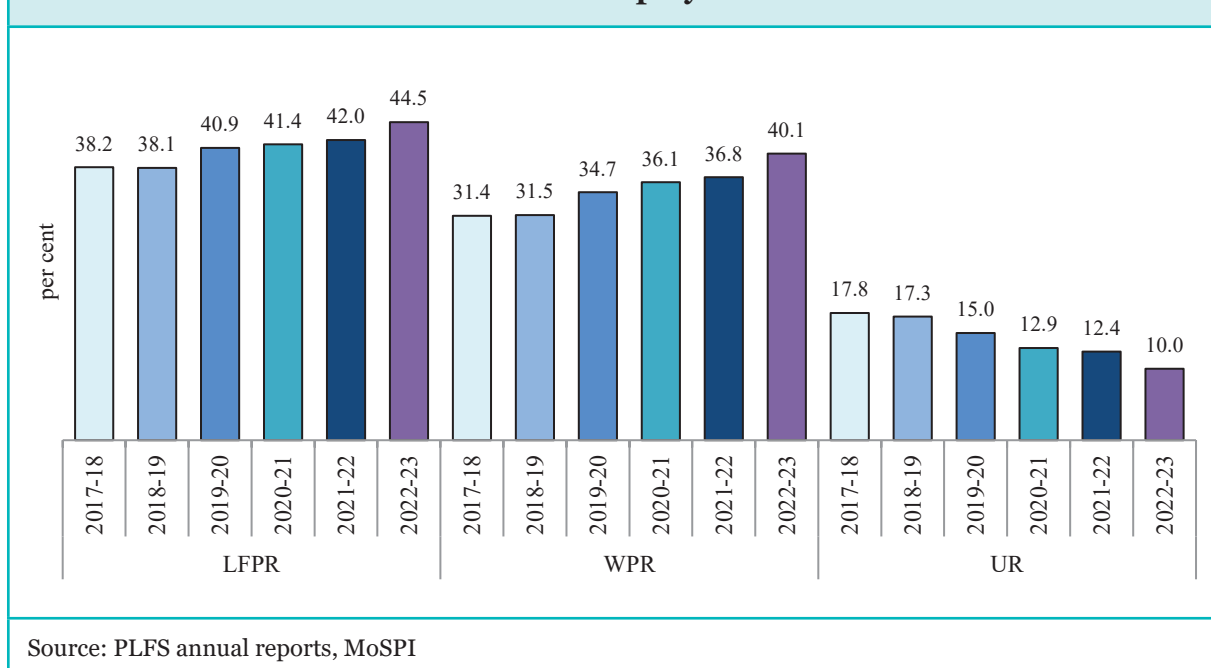
YOUTH AND FEMALE EMPLOYMENT

Rising youth employment

8.8 India's demographic dividend is a stepping stone for sustained high growth and global competitiveness in manufacturing and services. The decline in the annual youth unemployment rate accompanied by greater youth participation in the labour force indicates better utilisation of this dynamic resource.

8.9 According to PLFS, youth (age 15-29 years) unemployment rate has declined from 17.8 per cent in 2017-18 to 10 per cent in 2022-23, while other indicators have also improved over time. The rise in youth employment is also reflected in the formal employment figures, as per Employees' Provident Fund Organisation (EPFO) data, presented in latter section of the chapter. The annual new EPF subscribers aged 18-28 years have been following an upward trajectory after witnessing a decline during the COVID-19 pandemic. Nearly two-thirds of the new subscribers in the EPFO payroll have been from the 18-28 years band. Thus, youth employment has been rising in tandem with the youth population.

Chart VIII.6: Youth employment indicators

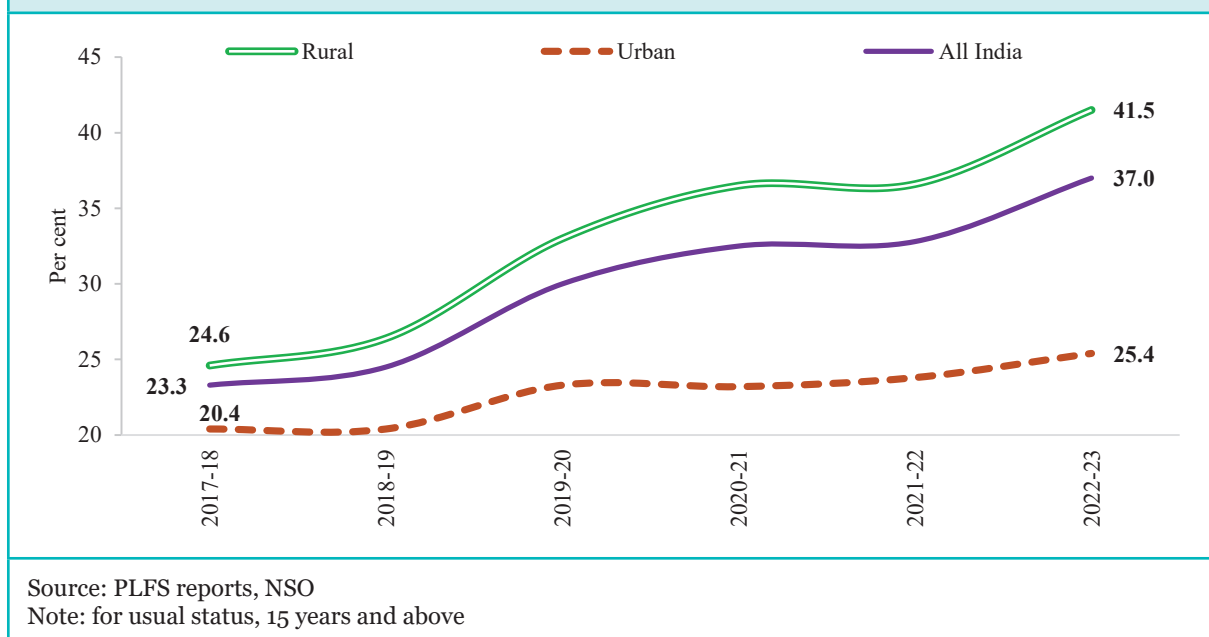


Rise in Female LFPR: Unfolding the gender dividend

8.10 From the gender perspective, the female labour force participation rate (FLFPR) has been rising for six years. While urban FLFPR has also been growing, the rural FLFPR has witnessed a steep rise of 16.9 percentage points between 2017-18 and 2022-23, indicating a rising contribution of women to rural production. This could culminate from multiple factors,

including continuous high growth in agriculture output and freeing up of women's time due to substantial expansion of access to basic amenities such as piped drinking water, clean cooking fuel, sanitation, etc. On the other hand, the possibility of the rise in FLFPR stemming from distress does not hold much ground since distress-driven FLFPR should have peaked during COVID-19 and declined afterwards instead of continuously rising since 2017-18. Other reasons that repudiate the thesis of distress-driven rise in FLFPR were elaborated in 'Indian Economy - A Review', published by DEA, Ministry of Finance in January 2024.⁶

Chart VIII.7: Rural India drives the rise in female LFPR



Employment in Factories

8.11 The Annual Survey of Industries⁷ (ASI) results for 2020-21 and 2021-22 showcased the Indian manufacturing sector's resilience, given its turnaround after a marginal fall in employment in the pandemic year of 2020-21. As per ASI 2021-22, employment in the organised manufacturing sector recovered to above the pre-pandemic level, with the employment per factory continuing its pre-pandemic rise. The growth in wages per worker resumed after a brief hiatus. This, coupled with higher wage growth in the rural areas during the last five years, bodes well for demand creation in the countryside.⁸ During FY15-FY22, the wages per worker in rural areas grew at 6.9 per cent CAGR vis-à-vis a corresponding 6.1 per cent CAGR in urban areas.

⁶ The publication is available at <https://dea.gov.in/sites/default/files/Monthly%20Economic%20Review%20January%202024.pdf>

⁷ The ASI, conducted by the MoSPI, covers the organised manufacturing sector of the economy. Its 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 twenty or more workers without electricity.

⁸ It may be noted that, as of FY22, 42 per cent of factories and 45 per cent of workers are in rural areas.

Chart VIII.8: Trend in employment in organised manufacturing sector

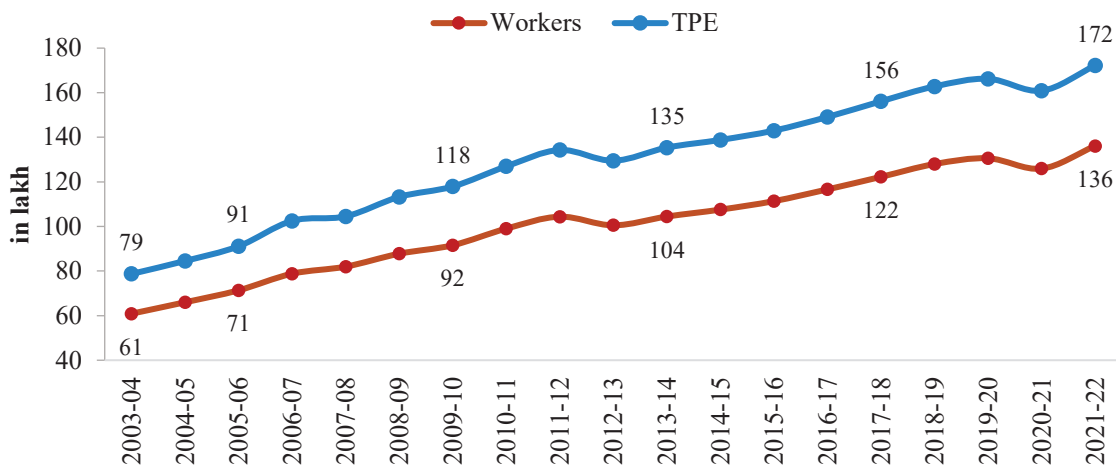


Chart VIII.9: Trend in employment per factory

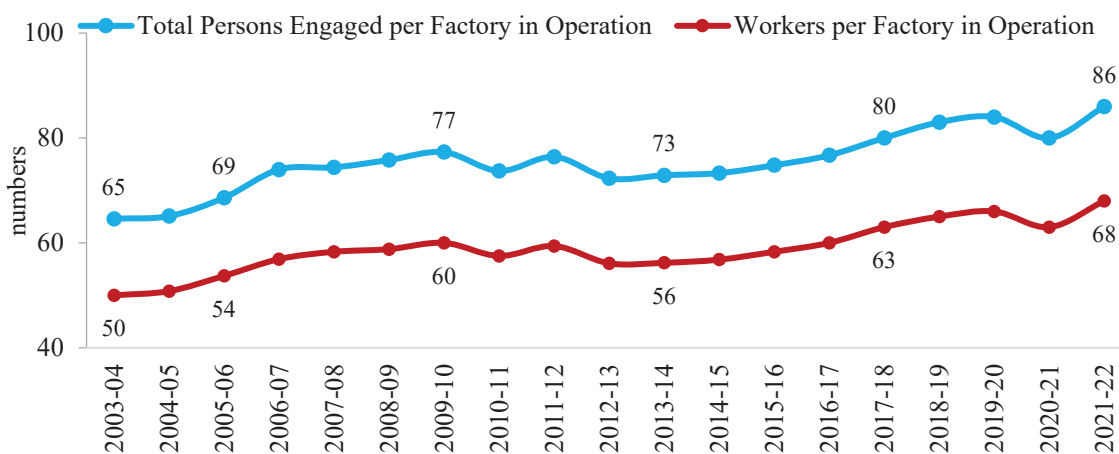
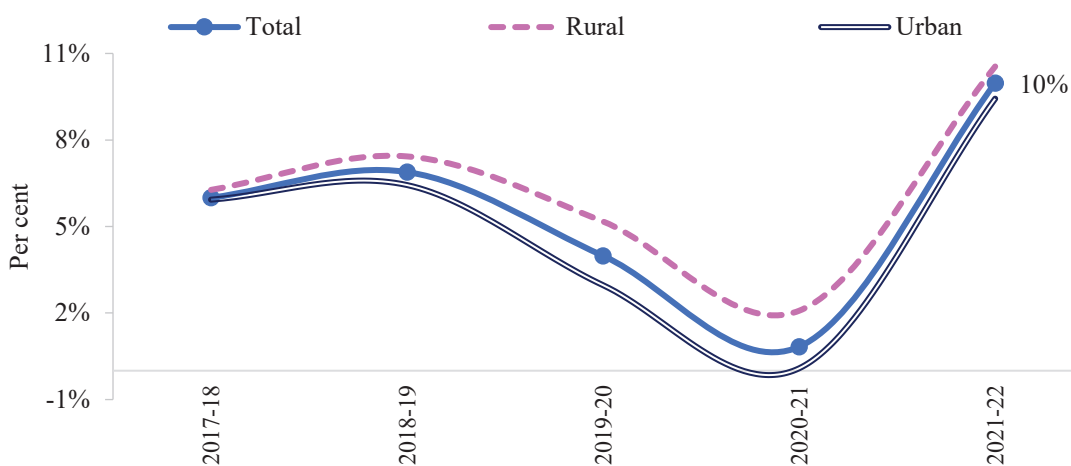


Chart VIII.10: YoY growth in wages per worker



Source: Annual Survey of Industries reports, MoSPI

Note: TPE: Total Persons Engaged

8.12 State-wise, the top six states in terms of the number of factories, were also the greatest factory employment creators. More than 40 per cent of factory employment was in Tamil Nadu, Gujarat, and Maharashtra. In contrast, the highest employment growth between FY18 and FY22 was seen in states with a higher share of young population, including Chhattisgarh, Haryana and Uttar Pradesh (Chart VIII.12).⁹

Chart VIII.11: Top six states in the number of factories and employment

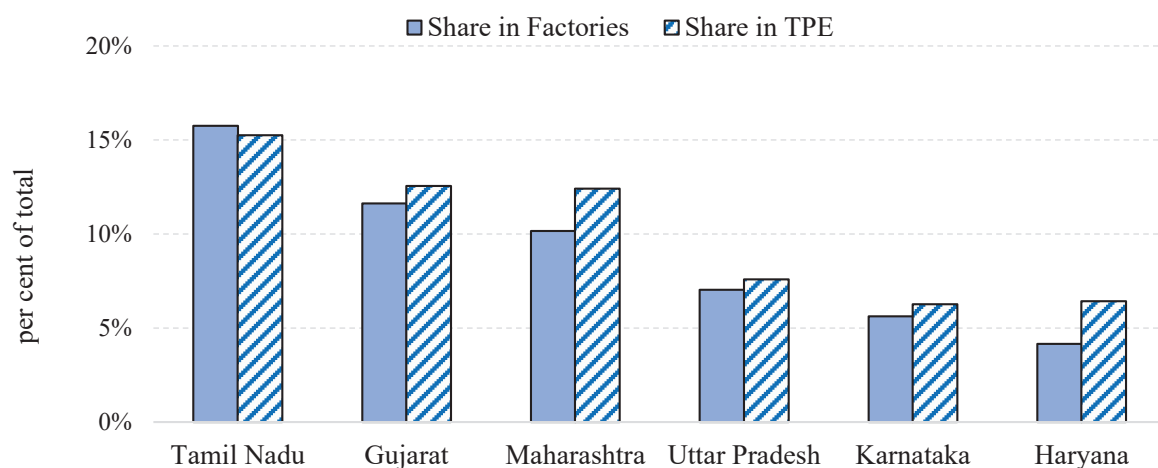
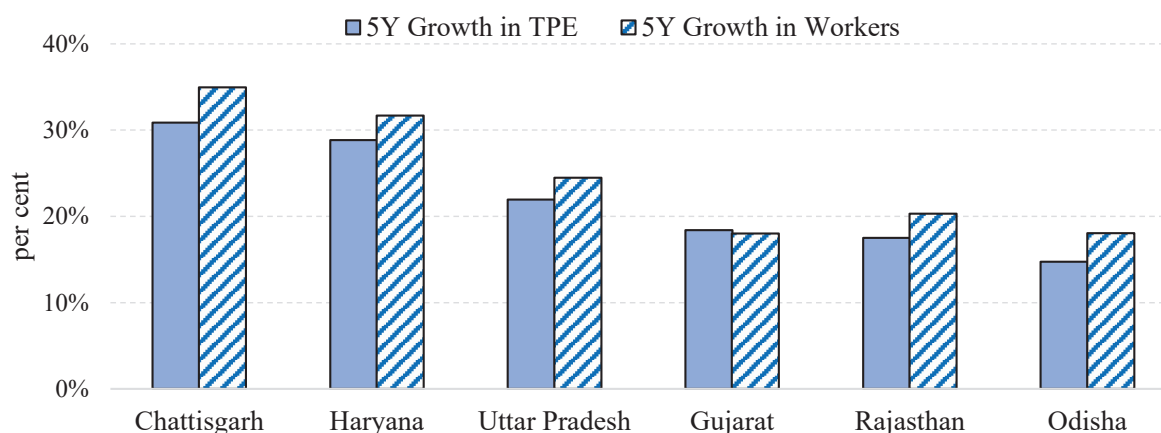


Chart VIII.12: Top six states in five years (FY18-FY22) growth in employment in factories



Source: Annual Survey of Industries reports, MoSPI

Note: TPE: Total Persons Engaged

8.13 In terms of number of establishments, the organised manufacturing landscape is dominated by smaller factories. In 2021-22, factories employing less than 100 people constituted 79.2 per cent of all factories while contributing only 22.1 per cent of total persons employed and 20.9 per cent of workers. This has been improving over time as there is a visible trend towards a rise

⁹ The projected share of population below 30 years is 55.5 % in Chhattisgarh, 52.8% in Haryana, and 60.1 per cent in UP. Source: M/o Health and Family Welfare projections available at <https://tinyurl.com/2knzk5xe>

in larger factories. Compared to a broadly constant number of smaller factories, the number of factories employing more than 100 workers saw 11.8 per cent growth over FY18 to FY22. Thus, in terms of total persons engaged, employment has been rising in bigger factories (employing more than 100 workers) than in smaller ones, suggesting a scaling up of manufacturing units. This is a positive development in terms of quality of employment, as wages per worker tend to rise with the employment size of factories.

Chart VIII.13: Predominance of smaller factories while larger factories generate greater employment

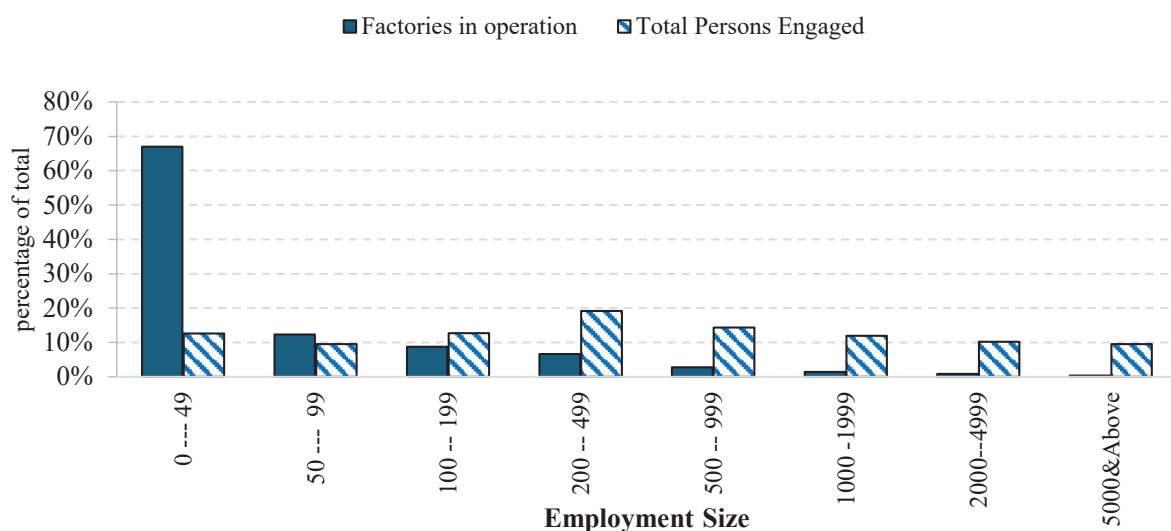
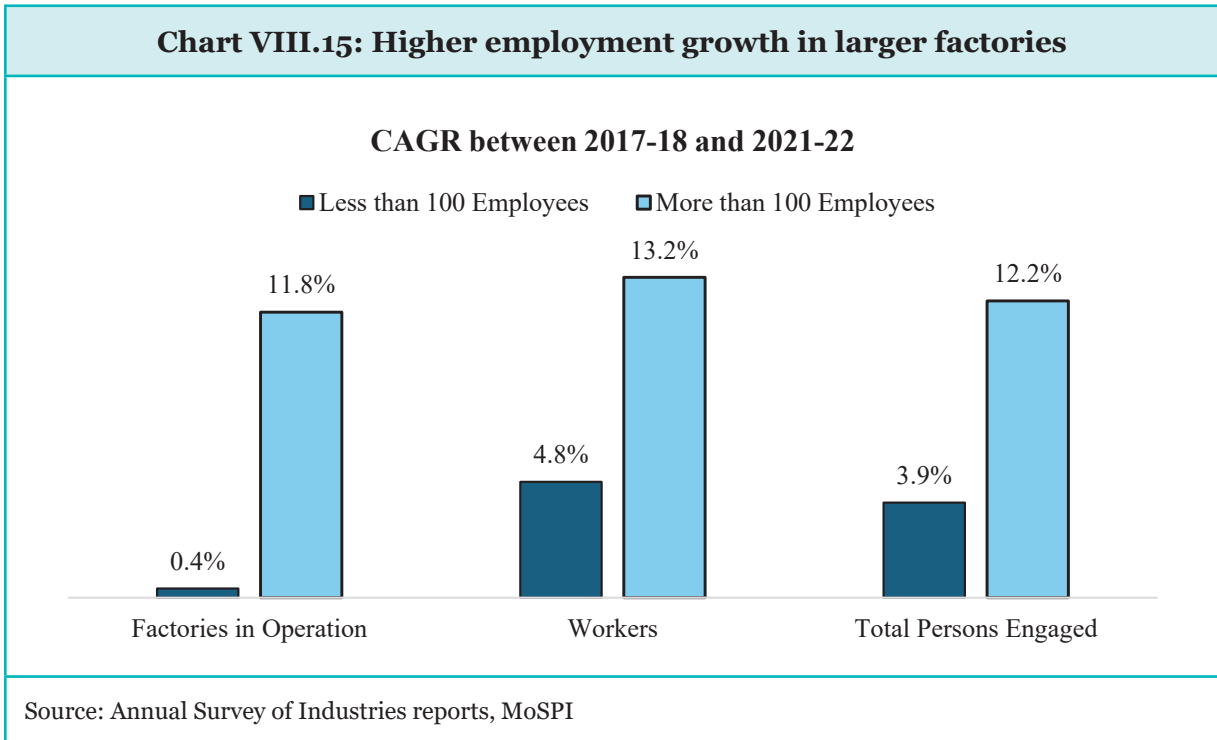


Chart VIII.14: Larger factories pay better wages



Source: Annual Survey of Industries reports, MoSPI



8.14 In terms of the sectoral share of factory employment (total persons engaged), the food products industry (11.1 per cent) remained the largest employer, followed by textiles, primary metals, wearing apparel and motor vehicles, trailers, and semi-trailers. However, in terms of growth in employment in the last five years, the rising heft of computers and electronics, rubber and plastic products, and chemicals indicates that Indian manufacturing is moving up the value chain and have emerged as sunrise sectors for manufacturing employment generation.

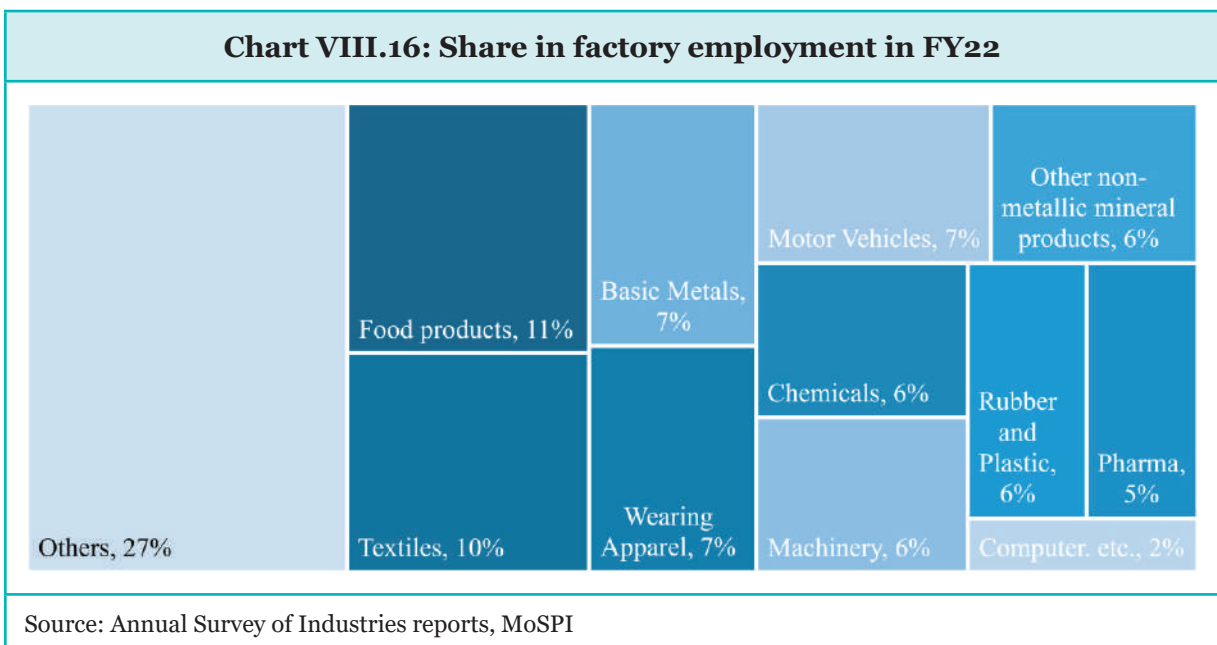
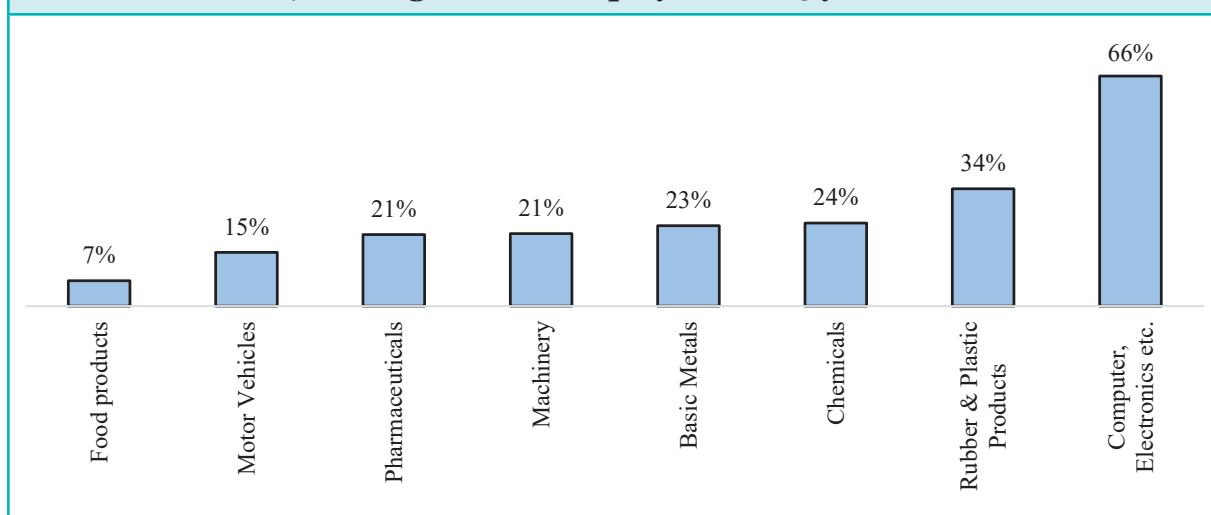


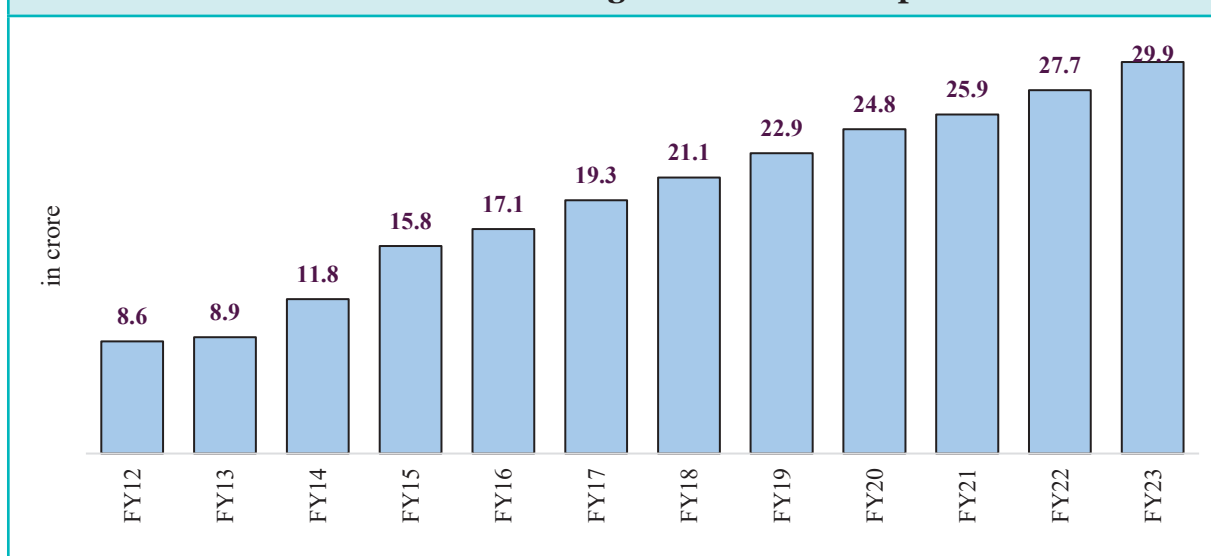
Chart VIII.17: Total growth in employment in 5 years: FY18 to FY22

Source: Annual Survey of Industries reports, MoSPI

Note: Employment refers to the Total Persons Engaged

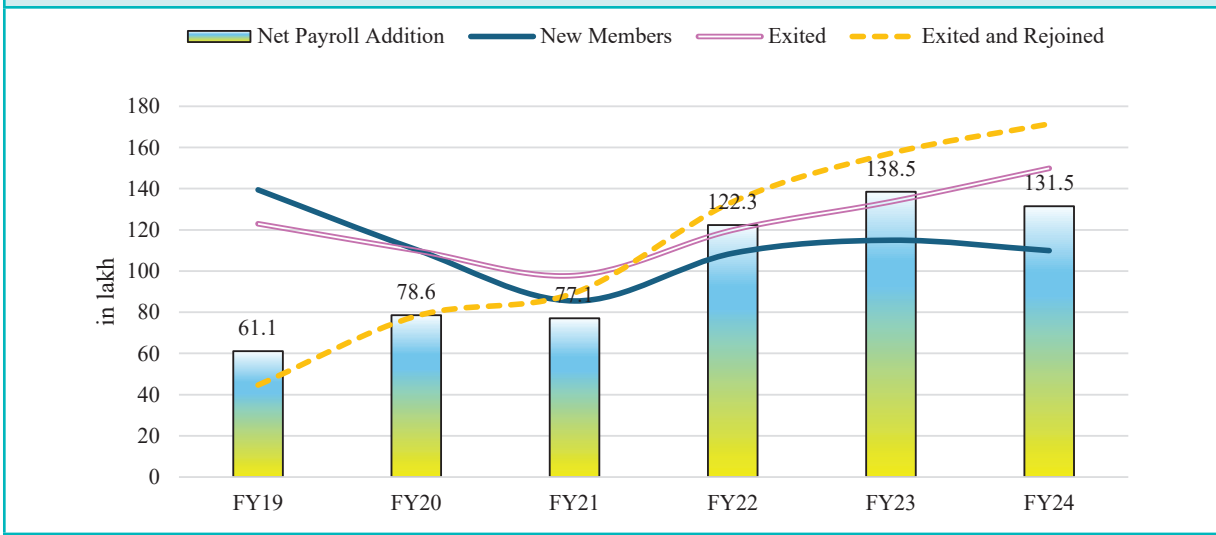
Enrolment in EPFO

8.15 The organised sector job market conditions measured by payroll data for EPFO indicate a consistent year-on-year (YoY) increase in payroll addition since FY19 (the earliest since data is available). The yearly net payroll additions to the EPFO more than doubled from 61.1 lakh in FY19 to 131.5 lakh in FY24, swiftly recovering from the pandemic aided by the Aatmanirbhar Bharat Rojgar Yojana (ABRY). The EPFO membership numbers (for which older data is available) grew by an impressive 8.4 per cent CAGR between FY15 and FY24 (refer Chart VIII.18).

Chart VIII.18: Rising EPFO membership

Source: EPFO Annual Report available at https://www.epfindia.gov.in/site_en/Annual_Report.php

Chart VIII.19: Net payroll addition in EPFO



Source: EPFO Monthly Reports available at https://www.epfindia.gov.in/site_en/Estimate_of_Payroll.php

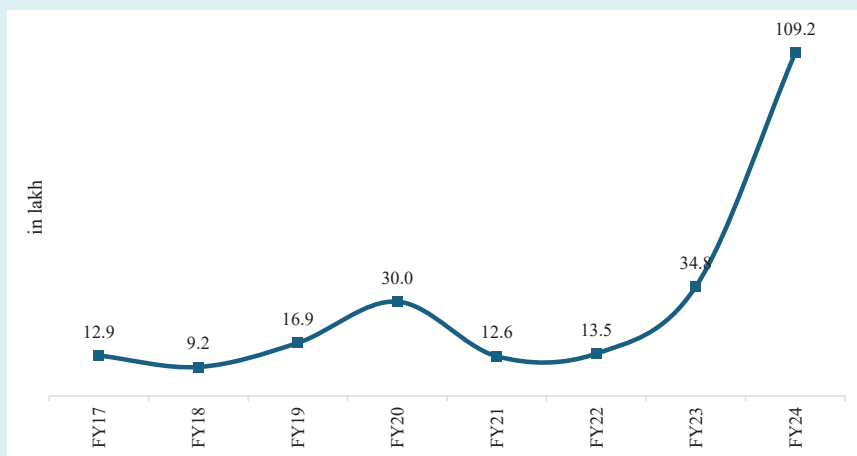
Government initiatives to boost employment generation

8.16 The Government has implemented a series of measures to boost employment generation, such as the rollout of the Production Linked Incentive (PLI) scheme to enhance India’s manufacturing capabilities, increase in capital expenditure, etc., and to promote worker welfare. This has been accompanied by a boost to self-employment through easing of access to credit, and multiple process reforms. Some of the schemes to promote both job creation and job creators are summarised in the Box VIII.1.

Box VIII.1: Initiatives to foster job creation and workers’ welfare

- Launched in 2015, the **National Career Service (NCS) Portal** offers employment and career services. By 31 March 2024, it has attracted 4.1 crore jobseekers and 25.6 lakh employers. The initiative includes 407 Model Career Centres and over 46,000 job fairs, with a 52 per cent increase in candidates shortlisted for jobs in FY24 compared to FY23, indicating a more competitive job market.

Chart VIII.20: Vacancies mobilised under NCS



- The **e-Shram portal** is the first-ever national database of unorganised workers with more than 29 crore workers registered. The portal has been integrated with the NCS portal to facilitate job search and aims to integrate with other relevant portals of different central Ministries/Departments in order to facilitate access of different Central Government schemes to unorganised workers at one place.
- In October 2020, the Government introduced the Aatmanirbhar Bharat Rojgar Yojana (ABRY) to boost employment with social security benefits post-COVID-19 job losses. By 31 March 2024, the scheme benefited 60.5 lakh individuals across 1.5 lakh establishments.¹⁰
- The Government has launched two significant contributory pension schemes to ensure **minimum pension for all workers**. The Atal Pension Yojana (APY), launched in 2015, has more than 6.5 crore subscribers now.¹¹ More than 50 lakh workers have enrolled under Pradhan Mantri Shram Yogi Maan-Dhan (PM-SYM) scheme, launched in 2019.¹²
- **Affordable insurance programmes:** Life and Disability cover is provided through Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) and Pradhan Mantri Suraksha Bima Yojana (PMSBY) of ₹2 lakh at an annual premium of ₹436 and ₹20 only.
- The new Labour Codes now provide **social security benefits to gig and platform workers** via a Social Security Fund, financed by contributions from the Central and State Governments, Aggregators, CSR etc. Additionally, the definition of Inter-State Migrant labour has been simplified.
- PM Street Vendor's AatmaNirbhar Nidhi (**PM SVANidhi**) Scheme, launched in June 2020 to facilitate collateral-free working capital loans to street vendors has more than 64 lakh beneficiaries to its credit.¹³
- The **One Nation One Ration Card** programme, launched in 2019, has enhanced migrant workers' welfare by allowing portable food security across India. Till December 2023, it facilitated over 124 crore portability transactions.¹⁴
- **Prime Minister's Employment Generation Programme (PMEGP):** The Government is implementing PMEGP for assisting entrepreneurs in setting up of new units in the non-farm sector. It aims to provide employment opportunities to traditional artisans/ rural and urban unemployed youth at their doorstep. Since 2018-19 to 30 January 2024, estimated employment generated (no. of persons) are 37.46 lakhs.
- **Deendayal Antyodaya Yojana – National Urban Livelihoods Mission: (DAY-NULM):** The Mission aims to reduce poverty and vulnerability of the urban poor households by enabling them to access self-employment and skilled wage employment opportunities, resulting in an appreciable improvement in their livelihoods on a sustainable basis. Since 2018-19 to 30 January 2024, estimated number of skill trained candidates placed under DAY- NULM are 5.48 lakhs.

10 Success of AB-RPY, link available at: <https://labour.gov.in/aatmanirbhar-bharat-rojgar-yojana-abry>

11 As per information received from PFRDA

12 Includes bulk enrolments of 506603.

13 <https://www.pmsvanidhi.mohua.gov.in/Home/PMSDashboard>

14 Lok sabha unstarred question 1784 dated 13.12.2023.

- **Pradhan Mantri Mudra Yojana (PMMY):** PMMY is being implemented by the Government for facilitating self-employment. Under PMMY, collateral free loans up to ₹10 lakh, are extended to micro/small business enterprises and to individuals to enable them to set up or expand their business activities. Around 47.7 crore loans were sanctioned under the scheme as on 29 March 2024.
- **Stand Up India:** Launched on 5 April, 2016, the scheme aims to promote entrepreneurship among the SC/ST and Women by facilitating bank loans of value between ₹10 lakh and ₹1 crore to at least one SC/ ST borrower and one-woman borrower per bank branch of Scheduled Commercial Banks for setting up greenfield enterprises in trading, manufacturing, services sector and in activities allied to agriculture. In FY20, the Stand-Up India Scheme was extended for the entire period coinciding with the 15th Finance Commission period of 2020-25. As of 20 May 2024, loans of ₹51,724 crore have been sanctioned to more than 2.29 lakh accounts under the scheme.¹⁵
- **Start Up India:** Sustained efforts by the Government spanning “simplification and handholding”, “funding support and incentives” and “industry academia partnership and incubation” have led to an increase in the number of Department for Promotion of Industry and Internal Trade (DPIIT) recognised startups from over 300 in 2016 to 1,17,254, as on 31 December 2023.¹⁶ These recognised startups are reported to have created over 12.42 lakh direct jobs creating significant economic impact.¹⁷
- **Programmes for promoting rural entrepreneurship,** including DAY-NRLM, RSETIs etc., as discussed in the chapter on Social Infrastructure.
- **Flagship programmes:** Besides these initiatives, various flagship programmes of the Government such as Make in India, Digital India, Smart City Mission, Atal Mission for Rejuvenation and Urban Transformation, Housing for All, Infrastructure Development and Industrial Corridors are also oriented towards generating employment opportunities.

8.17 Besides active interventions for social protection of workers, the Government has also promoted simplification of labour laws, as recommended by the National Commission on Labour in 2002. The Government rationalised and amalgamated 29 central laws into four Labour Codes in 2019 and 2020, after extensive consultations with stakeholders and public from 2015 to 2019. This was to promote employment creation and freeing workers from the web of legislations many of which trace their origins to the pre-independence period, reduce multiplicity of definitions and authorities relating to labour, and to induce transparency, accountability, and use of technology in enforcement of labour laws. Thereafter, the four Labour Codes; namely, the Code on Wages, 2019, the Industrial Relations Code, 2020, the Code on Social Security, 2020 and the Occupational Safety, Health and Working Conditions Code, 2020; have been enacted. The Code on Wages, 2019 was notified on 8 August, 2019 and the remaining three Codes were notified on 29 September, 2020.

¹⁵ Source: Inputs from Department of Financial Services

¹⁶ PIB release dated 12 Feb 2024 <https://pib.gov.in/PressReleasePage.aspx?PRID=2005206>

¹⁷ PIB release dated 2 Feb 2024 <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=2002100>

8.18 “Labour” as a subject is in the Concurrent List of the Constitution of India and under the Codes, the power to make Rules has been entrusted to Central Government, appropriate Government and State Governments. There is also a requirement of pre-publication of Rules by states in their respective Official Gazette for public consultation. As per available information, 32, 30, 31 and 31 States & UTs have also pre-published their draft Rules under the Code on Wages, 2019, the Industrial Relations Code, 2020, the Code on Social Security, 2020 and the Occupational Safety, Health and Working Conditions Code, 2020 respectively.

8.19 However, there remains scope to expedite the enactment of Labour Codes by the states. In addition, there exist other regulatory hurdles to employment generation, some of which are stricter than advanced economies, as elaborated in the Box VIII.2

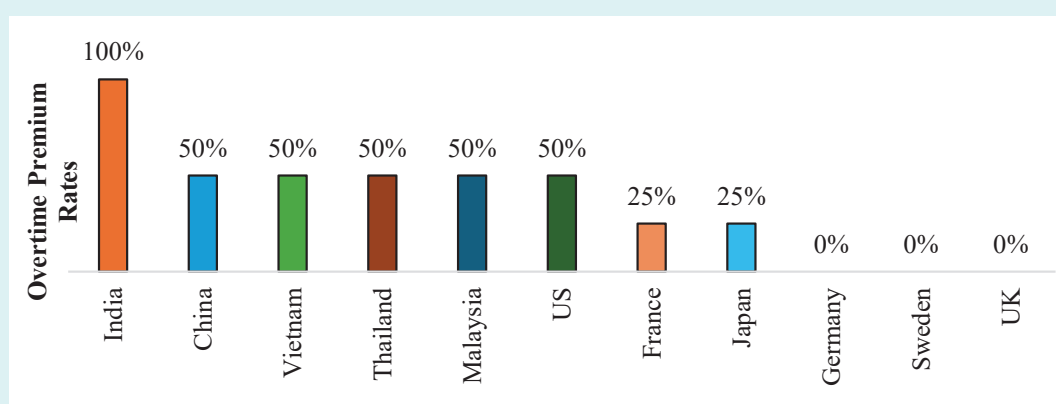
Box VIII.2: Re-balancing Labour Regulations to promote employment

Current labour regulations have unintended adverse repercussions for both the general workforce and women specifically. Although designed to safeguard women and enforce rigorous standards for all employees, these regulations inadvertently restrict employment opportunities and impede overall job creation. Some examples of these rules are mentioned below:

Higher overtime wage premium compared to peers and advanced economies

A comparison with other countries reveals that India’s stricter overtime wage regulations are potentially hindering the growth of the manufacturing sector by driving production to nations with lower overtime costs (Dandekar and Roy, 2023).¹⁸

Chart VIII.21: India has a higher overtime wage premium



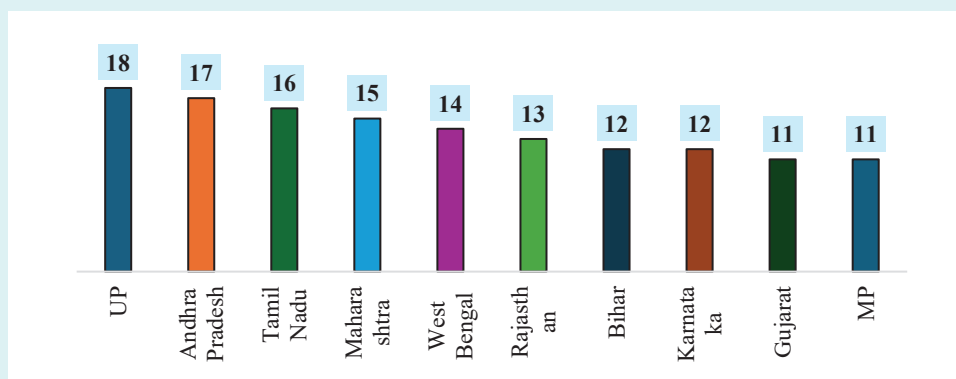
Source: Dandekar and Roy (2023)

Systematic barriers to job opportunities for women

The 10 most populous states collectively impose 139 prohibitions on women from participating in factory processes such as electroplating, petroleum generation, manufacturing of products such as pesticides, glass, rechargeable batteries etc. (Singh, 2023).¹⁹

¹⁸ Dandekar, S. & Roy, S. (2023, August 23). Double or Nothing. Prosperiti Insights. <https://prosperiti.substack.com/p/double-or-nothing>

¹⁹ Singh, A. (2023, April 30). Laws that limit women’s employment in India. India Development Review. <https://idronline.org/article/gender/laws-that-limit-womens-employment-in-india/>

Chart VIII.22: Number of activities restricted for women across states

Source: Singh (2023)

Welfare demand discourages growth

India prescribes higher floor space per worker on a factory floor compared to other countries. An Indian factory with 1,000 square metres (sqm) of usable floor space can employ up to 82 more workers if India were to adopt Malaysia's standard.²⁰ Increases in space requirements can discourage the expansion of factories.

Table VIII.1: Indian factories could hire more workers by adopting competitive per-worker space standards

Country	Per worker space (sqm)	Additional jobs created
India	3.38	N/A
Singapore	2.88	52
Switzerland	2.86	54
Malaysia	2.65	82
Germany	'Sufficient' Space	N/A
Norway	'Sufficient' Space	N/A

Source: Kaur, Kaur, and Roy (2023)

Inflexibility in working hours

Many countries offer more flexibility in organising work hours and allow for more overtime compared to India. This is limiting the monetisable time for Indian workers and affecting their families and the country's prosperity (Roy, Saxena, and Singh, 2023).²¹

20 Kaur, E., Kaur, S., & Roy, S. (2023, September 20). (No) Room to Grow. Prosperiti Insights. <https://prosperiti.substack.com/p/no-room-to-grow>

21 Anand, B., Roy, S., Saxena, P., & Singh, A. (2023, October 04): "Lower the bar, increase the earnings", Prosperiti Insights. <https://prosperiti.substack.com/p/lower-the-bar-increase-the-earnings>

Country	Working Hours limit in a factory
India	10.5
Bangladesh	11
Vietnam	12
China	No limit
Denmark	No limit
Indonesia	No limit
Norway	No limit
South Korea	No limit
Sweden	No limit
Switzerland	No limit
Source: Roy, Saxena, and Singh (2023)	

Conclusion

The new Labour Codes marginally improve some of the observations above. In some cases, limits have been moved from the Law to Rules to be made by states. However, the Codes are yet to be fully operationalised and many states are found to be reintroducing the older restrictions under the new Laws.

Labour Laws need to be reviewed to re-evaluate incentives for employers, with a focus on achieving better outcomes for economic growth and prosperity in the manufacturing sector. Implementing more flexible labour laws could unleash substantial economic potential, promote gender inclusivity, and attract industrial investment.

8.20 The states would also do well to reduce the compliance burden of the Micro, Small and Medium Enterprises (MSMEs). The management bandwidth in MSMEs to grow business, seek new markets, get funding, and hire labour is limited, and this limited bandwidth is spent disproportionately on compliance. Whereas the Union Government frames the Rules, the implementation or supervision is in the hands of Inspectors and Supervisors who come from the relevant departments in the states. This is where senior levels of bureaucracies at the Centre and states can and should collaborate to make it easier for businesses to comply without being squeezed out of time and other resources.

Trend in rural wages

8.21 In FY24, rural wages rose at above-5 per cent every month, YoY. On an average, nominal wage rates in agriculture grew by 7.4 per cent for men and 7.7 per cent for women, benefitting from robust agriculture growth during the period. The wage growth in non-agricultural

activities was relatively lower, at 6.0 per cent for men and 7.4 per cent for women during the same period. Going forward, as inflation is expected to soften with the easing of international commodity prices and domestic food prices, it is expected to translate into a sustained rise in real wages.

Chart VIII.23 (a): YoY growth in nominal rural wages, Men

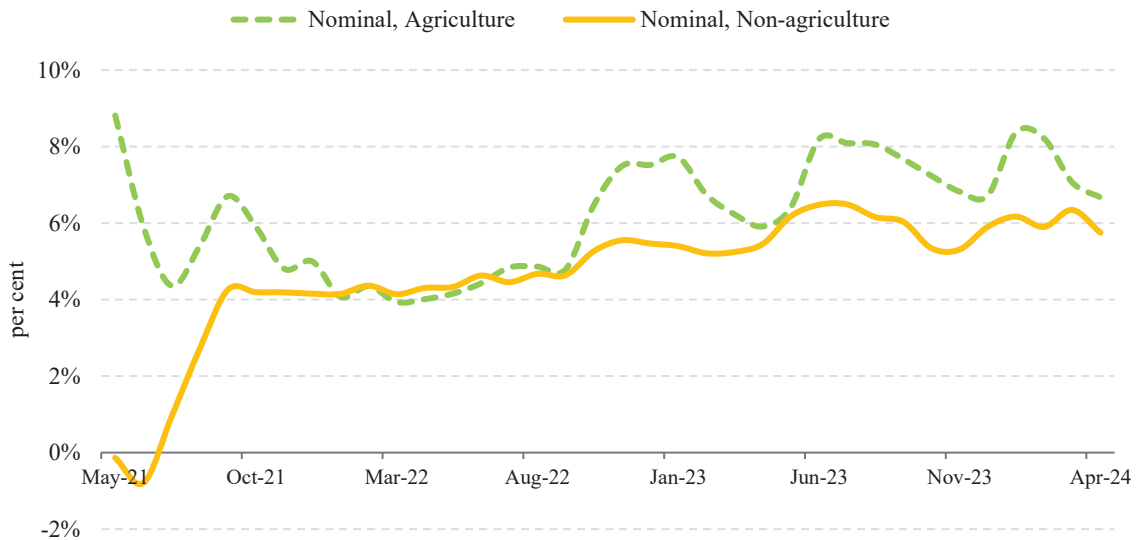
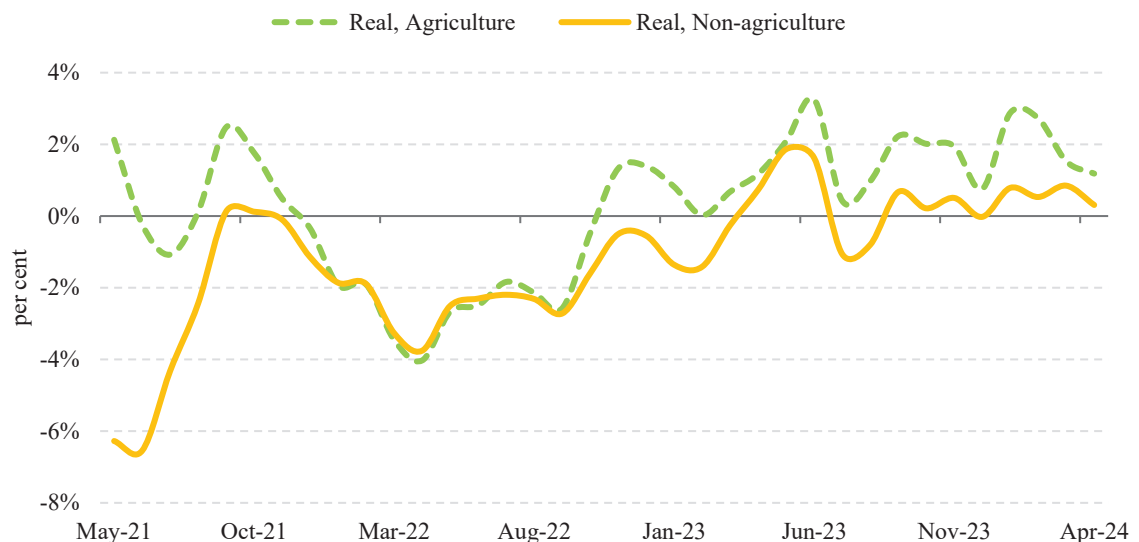


Chart VIII.23 (b): YoY growth in real rural wages, Men



Source: Monthly Rural Wage Rates by Labour Bureau

Note: For calculating real wages, nominal wages are divided from CPI-Rural Labour

THE EVOLVING LANDSCAPE OF JOBS IN INDIA

8.22 The interaction of various production factors in generating value-addition is constantly evolving in an economy that is in transition to middle-income status. The human resources who bring about this progression must also adapt to it to be employable in the changed scenario. The global labour market is amid a ‘disruption,’ constantly being reshaped by the fourth industrial revolution, concerted efforts by all economies to decarbonise in the wake of a looming climate crisis and other geopolitical vicissitudes. In a recent study, David Autor²² wrote that changes in the nature of work in the last few decades—primarily technological—have been more disruptive and less beneficial for non-college workers.

8.23 According to the World Economic Forum’s (WEF) Future of Jobs report, 2023²³, in the next five years, 23 per cent of the jobs are expected to change globally. This change is likely to consist of growth in 10.2 per cent of the jobs and decline in 12.3 per cent of the jobs. Employers anticipate 69 million new jobs to be created and 83 million eliminated - a net decrease of 14 million jobs, or 2 per cent of current employment. The following are some ways in which the work environment is evolving.

Fourth industrial revolution

8.24 Epochal changes in the economic structures manifested by three Industrial Revolutions (IR), starting from the 18th century, have caused technological disruption and significant job displacement. Each has resulted in transformations in the manner in which firms and individuals interact with the labour markets, redefining the relationship between technology and how work gets done.²⁴ Each IR caused a significant loss of livelihood for workers whose tasks were most susceptible to automation and those who could not quickly adapt to new technology. People have had to skill and reskill to maintain their place in the labour markets.

8.25 The world is in the midst of a fourth industrial revolution characterised by novel ways in which technology is becoming embedded within societies through ‘cyber-physical systems,’ Internet of Things (IoT), big data, nano-technology, and networks. Evolving forms of machine learning, AI, blockchains, genetic engineering, quantum computing, advanced analytics, automation, and advanced manufacturing technology are some examples of what constitutes this technological revolution. In the backdrop of this evolving revolution, the future of job markets in India is undergoing a significant transformation, as is happening in the rest of the world.

8.26 The demand for digital roles is proliferating, hastened further by the COVID-19 pandemic and its lingering impact. Technological advancements are leading to a growing demand for tech-savvy professionals trained in emerging areas such as big data, AI and machine learning, cybersecurity, cloud computing, etc. According to the WEF, the fastest-growing jobs in the next five years will be those of AI and machine learning specialists, sustainability specialists,

22 David Autor (2019), “Work of the Past, Work of the Future”, NBER Working Paper No. 25588 <http://www.nber.org/papers/w25588>.

23 <https://www.weforum.org/publications/the-future-of-jobs-report-2023/>

24 For instance, Didier, N. (2024). Turning fragments into a lens: Technological change, industrial revolutions, and labor. *Technology in Society*, 77, 102497, present how the labour market has evolved in the context of technological change.

business intelligence analysts and information security specialists; the largest absolute growth is expected in education, agriculture, and digital commerce.

Disruptions due to the adoption of AI

8.27 The biggest disruption for the future of work is the accelerated growth in AI, which is poised to revolutionise the global economy. India would not remain immune to this transformation. AI is being recognised as a general-purpose technology, like electricity and the internet, which is phenomenal in its rapid pace of innovation and ease of diffusion. As AI systems continue to get smarter and adoption increases, the future of work will be reshaped. While AI has considerable potential for boosting productivity, it also has the potential to disrupt employment in certain sectors. Routine tasks, including customer service, will likely witness a high degree of automation; creative sectors will see extensive usage of AI tools for image and video creation; personalised AI tutors can reshape education and sectors like healthcare can witness accelerated drug discovery. On the impact of AI on employment, insights can be drawn from Acemoglu and Johnson's work, presented in Box VIII.3.

Box VIII.3: Ricardo's Pivot and the Centrality of Technological Choices

Conventional economic wisdom would suggest that technological changes generate productivity²⁵ gains leading to higher wages and more economic opportunities in the long run. However, according to Acemoglu and Johnson (2024)²⁶, "... *taking such a long view ignores the struggles of workers to secure their fair share of prosperity made possible by the new machinery.*" The authors take a cue from Industrial Revolution in Britain to understand the relationship between AI-induced rise in productivity and employment in the present. Specifically, the authors take the examples of automation of cotton spinning through the introduction of the spinning jenny in the late 18th century, automation of weaving by the power loom in the 19th century, and the advent of the railways and heavy industries in the second half of 19th century.



*Spinning Jenny*²⁷



*Power loom in a factory*²⁸

25 Productivity refers to how much output can be produced with a given set of inputs. Productivity increases when more output is produced with the same amount of inputs or when the same amount of output is produced with less inputs.

26 Acemoglu, Daron and Johnson, Simon, Learning from Ricardo and Thompson: Machinery and Labor in the Early Industrial Revolution, and in the Age of Ai (May 2024). NBER Working Paper No. w32416, SSRN: <https://ssrn.com/abstract=4826001>.

27 Source: <https://kids.britannica.com/students/article/spinning-jenny/630347>

28 Source: <https://historyofinformation.com/detail.php?id=42>

While spinning jennies reduced the cost of yarn and increased the productivity and demand of handloom weavers, the power loom led to labour substitution and halving of real wage of artisans between 1806 and 1820. The decline in real wages of weavers after the arrival of power loom is said to be behind Ricardo's change in opinion from "*machinery did not lessen the demand for labour*" in 1819 to "*If machinery could do all the work that labour now does, there would be no demand for labour*" in 1821. Likewise, the coming of the Liverpool and Manchester railways in 1830 spurred new jobs in modern manufacturing, including design, repair, maintenance, and clerical tasks.

The authors highlight the inadequacy of economic factors to explain the impact of automation on wages and emphasise on the forces of political economy, i.e., the balance of power between labour and capital. Here, the interpretation of E.P. Thompson, an English historian, seems more suitable to them in explaining the impact of power loom on weavers. According to Thompson, the movement of workers to factories led to their loss of autonomy, and, in the absence of any policy support or bargaining power, culminated in the deterioration of wages and worker conditions.

In simple words, it is how we use the technology- whether we use it for automation, surveillance and control or we use it for informed decision making, problem-solving and augmentation²⁹, that decides whether AI will facilitate the path of job creation or will be a hindrance to it. During Ricardo's time, this choice was made by the factory owners, employers and industrialists while labourers underwent harsh working conditions, surveillance and control. Times have changed now, workers are certainly more independent, and hold power through strict labour laws and trade unions. Several reports today mention that AI will not destroy jobs rather transform them. Studies emphasise the need for humans to guide this AI transition.^{30 31}

The paper concludes that automation may be good or bad, depending on how we deploy it, and the direction of the technology being implemented. New technology can hurt labour interests by reducing the marginal productivity of labour³² while overall productivity may rise, thereby leading to substitution of labour by machines, as in the case of the handloom weavers. At the same time, automation can benefit labour in two ways. Firstly, if it significantly increases the marginal productivity of labour in the right sectors thereby increasing labour demand in non-automated tasks or in industries producing complementary products, as in the case of jennies. Secondly, when automation is accompanied by creation of new tasks and increase in marginal productivity of labour in new activities like in the railways example (Acemoglu and Johnson 2023). That said, political economy remains decisive in ensuring shared prosperity from technology. This is termed as the 'centrality of technological choices'.

29 <https://www.project-syndicate.org/commentary/ai-automation-threatens-workers-lessons-from-industrial-revolution-and-david-ricardo-by-daron-acemoglu-and-simon-johnson-2024-04>

30 <https://www.ilo.org/resource/news/generative-ai-likely-augment-rather-destroy-jobs>

31 <https://hbr.org/2021/11/automation-doesnt-just-create-or-destroy-jobs-it-transforms-them>

32 The marginal product(ivity) of labour is defined as the amount that output would be increased if one more unit of labour were employed, while everything else remains the same.

8.28 Research done in the context of the US informs that Generative AI (GenAI) may have a far higher impact on reshaping jobs than replacing jobs.³³ According to IMF (2023)³⁴ and IMF (2024)³⁵, almost 40 per cent of global employment is exposed to AI, with the exposure of advanced economies being 60 per cent due to the prevalence of cognitive-task-oriented jobs. The study develops an index of potential AI complementarity, which suggests that about half of these may be negatively affected by AI. At the same time, the rest could benefit from enhanced productivity through AI integration. It finds that employment highly exposed to AI is 26 per cent for India, divided into 14 per cent for occupations with high complementarity and 12 per cent for those with low complementarity.^{36 37}

8.29 India, with its vast demographic dividend and a very young population, is uniquely situated as AI poses both risk and opportunity. According to Capital Economics (2024), the current diffusion and adaptation of AI in India remains low compared to US, Europe, and the developed Asian economies. Manufacturing sector is less exposed to AI as industrial robots are neither as nimble nor as cost-effective as human labour. In inventory and supply chain management, AI applications could rather be complementary to labour. Nevertheless, at particular risk is the BPO sector, where GenAI is revolutionising the performance of routine cognitive tasks through chatbots, and employment in the sector is estimated to decline considerably in the next ten years. In the following decade, however, gradual diffusion of AI is expected to augment productivity. Uses of AI to identify health risks out of digitalised health data, predict weather, and complementing teachers in grading tests and translating texts are some of the development gaps that AI can plug.³⁸

8.30 Widespread adoption of AI across the services sector can significantly reshape and even replace jobs. Based on job postings data from India's largest job website, Copestake, A. et. al. (2023) interpret a near-exponential increase in the demand for AI-related skills since 2016. They find that the demand for AI skills by businesses has a negative impact on the need for non-AI roles and on the top percentile of wages, due to the displacement of high-skilled, managerial positions and non-routine, intellectual tasks.³⁹

8.31 Given the affinity of India's population to work with technology, as seen with the digital public infrastructure, proactive interventions by the Government and industry can position India as a key player in the AI age. Employees or job seekers would need skills beyond communication, collaboration, and presentation, such as analytical thinking and innovation;

33 Forrester's 2023 Generative AI Jobs Impact Forecast, US, <https://www.forrester.com/report/forresters-2023-generative-ai-jobs-impact-forecast-us/RES179790>.

34 Pizzinelli, C., A. Panton, M. M. Tavares, M. Cazzaniga, and L. Li, (2023) "Labor Market Exposure to AI: Cross-country Differences and Distributional Implication." IMF Working Paper 23/216.

35 Cazzaniga and others. 2024. Gen-AI: Artificial Intelligence and the Future of Work. *IMF Staff Discussion Note SDN2024/001*.

36 "Exposure" to AI is defined as the degree of overlap between AI applications and required human abilities in each occupation.

37 The 2023 IMF paper extends the standard measure of AI exposure, accounting for AI's potential as either a complement or a substitute for labour, where complementarity reflects lower risks of job displacement.

38 Shilan Shah, India's Economy in the era of AI, Capital Economics, 23 Jan 2024

39 Copestake, A., Marczinek, M., Pople, A., & Stapleton, K. (2023). AI and services-led growth: Evidence from Indian job adverts.

complex problem solving, critical thinking; learning and self-development; technology design and programming; and resilience and adaptability, to face the AI challenge

Making the most of AI in India

8.32 Despite India being one of the leaders in AI globally, a review of existing literature shows that not much prior research has been done in India. This gap highlights the need for research and development in this sector. The AI related research papers published by China in 2019 were 102,161, followed by 74,386 in US and 23,398 in India, which is less than one-fourth of China. Outputs in AI Research and Development are highly skewed, with concentration in only a few countries.^{40 41}

8.33 The US, being the leader in the AI R&D output, has clearly laid out a well-defined strategic plan to strengthen its AI sector. The plan consists of 9 steps, as mentioned in the latest 2023 report by its National Science and Technology Council⁴², i.e., making long-term investments in AI Research, developing effective methods for human-AI collaboration, understanding and addressing implications of AI, ensuring the safety and security of AI systems, developing datasets for AI training and testing, measuring and evaluating AI systems, better understand national AI R&D workforce needs, expanding private-public partnerships, and establishing a coordinated approach to international collaboration in AI Research. This strategy marks a significant move of the US Government to address the challenges that cannot be resolved by the sectors alone.

8.34 A policy brief by Research and Information System for Developing Countries (RIS) suggested that there is a need for an Inter-Agency Coordination Authority for AI which would act as a central institution guiding the research, decision-making, policy planning on AI and job creation.⁴³ The brief also suggested that AI will create more jobs but may have a negative short-term impact, and to counter this impact there is a need to invest in capacity building, upskilling, training, and forming policies to ensure that low-skilled workers do not suffer from any potential job losses.

8.35 AI has made a significant growth in the agri-tech, industry & automotive, healthcare, BFSI and retail sectors in India. One of the significant examples include Praman Exchange, world's largest horticulture exchange, powered by Intello Labs which uses computer vision to map the quality of horticulture products. Pramaan's technology achieves quality assessment with 95 per cent accuracy, surpassing the manual assessment rate of 70 per cent. This gives the contractors the required time and flexibility to trade from anywhere in the world.⁴⁴

40 <https://thedocs.worldbank.org/en/doc/2e658ef2144a05f30e254221ccaf7a42-0200022021/original/DD-Analytical-Insights-Note-4.pdf>

41 <https://www.nature.com/articles/d41586-020-03409-8> (Savage 2020)

42 National Science and Technology Council | The White House <https://www.whitehouse.gov/wp-content/uploads/2023/05/National-Artificial-Intelligence-Research-and-Development-Strategic-Plan-2023-Update.pdf>

43 https://www.ris.org.in/sites/default/files/Publication/Policy%20brief-104_Amit%20Kumar.pdf

44 <https://www.investindia.gov.in/team-india-blogs/artificial-intelligence-powering-indias-growth-story>

8.36 The Government has launched several initiatives to ensure an AI enabled ecosystem and to connect AI to the youth of the country. Some of these include ‘Future Skills Prime’, ‘YUVAi: Youth for Unnati and Vikas with AI’ a national programme for school students and ‘Responsible AI for Youth 2022’⁴⁵. A budget of ₹10,300 crore has been provided in 2024 for the India AI Mission, a significant move to strengthen the AI ecosystem.⁴⁶

Shift towards gig economy

8.37 A marked shift in the employment scenario has led to the rise of the gig economy globally. It encompasses freelancers, online platform workers, self-employed, on-call workers, and creative tech talent. In India, the rise of the gig economy is driven by the emergence of tech-enabled platforms, an increase in access to the internet backed by the development of digital public infrastructure, the demand for flexible work arrangements, and the focus on skills. According to NITI Aayog’s indicative estimates based on national labour force survey data, in 2020–21, 77 lakh (7.7 million) workers were engaged in the gig economy. They constituted 2.6 per cent of the non-agricultural workforce or 1.5 per cent of the total workforce in India.⁴⁷

8.38 Research studies have shown that participation in the gig economy is higher in developing countries (between five and 12 per cent) compared to developed economies (between one and four per cent), and most of these jobs are in lower-income job types, such as deliveries, ridesharing, microtasks, care and wellness (BCG 2021).⁴⁸ The continuing high demand for such services and job flexibility is boosting entry-level job creation in tier-2 and tier-3 cities, including part-time work for students entering the job market or as a shock absorber in case of temporary unemployment, with a high probability of workers moving to better-paying jobs after the platform experience (NCAER 2023).⁴⁹

8.39 The gig workforce is expected to expand to 2.35 crore (23.5 million) by 2029–30. Gig workers are expected to form 6.7 per cent per cent of the non-agricultural workforce or 4.1 per cent of the total livelihood in India by 2029–30.⁵⁰ While the gig economy may open up employment opportunities for various sections of workers, including youth, persons with disabilities, and women, a significant issue in the Indian context and globally has been the creation of effective social security initiatives for gig and platform workers. The Code on Social Security (2020) marks a significant advancement by expanding the scope of social security benefits to encompass gig and platform workers.

Climate change and green energy transition

8.40 With climate change a hard reality of the present times and projections pointing towards an increase in the frequency and intensity of extreme weather events, the concomitant outcome is the possible loss of jobs and productivity. Heat is an occupational safety and health hazard. According to the International Labour Organization (ILO), projections based on a global

45 Parliament Question “Impact of AI” <https://labour.gov.in/sites/default/files/pib2002657.pdf>

46 PIB <https://pib.gov.in/PressReleasePage.aspx?PRID=2012375>

47 NITI Aayog, June 2022, India’s Booming Gig and Platform Economy

48 BCG report “Unlocking the potential of Gig Economy in India” [India-Gig-Economy-Report.pdf](https://www.bcg.com/india-gig-economy-report) (bcg.com)

49 NCAER, August 2023, Socio-economic Impact Assessment of Food Delivery Platform Workers

50 Ibid. footnote 47

temperature rise of 1.5°C by the end of the 21st century and also on labour force trends suggest that in 2030, 3.8 per cent of total working hours worldwide will be lost to high temperatures – the equivalent of 136 million full-time jobs – and economic losses of \$2,400 billion.⁵¹ The Report notes that India is one of the most vulnerable countries to productivity losses, given its high share of agricultural and construction employment and location within the tropical latitude.

8.41 Another aspect of climate change is the efforts to mitigate its impact by adopting green technologies and transitioning to greener energy alternatives. This trend is leading to businesses witnessing a strong job-creation effect driven by investments that facilitate the green transition of businesses and the application of ESG standards.

8.42 For instance, India's green transition is and is more likely to significantly impact job opportunities in the renewable energy sector. Tyagi et al (2021)⁵² observes that, by 2030, clean energy initiatives can potentially create about 3.4 million jobs (short and long-term) by installing 238 GW of solar and 101 GW of new wind capacity to achieve the 500 GW non-fossil electricity generation capacity. These jobs represent those created in the wind and on-grid solar energy sectors. About one million can be employed to take up these green jobs.⁵³

8.43 Climate change also affects worker well-being, as highlighted in a recent ILO report⁵⁴, creating a 'cocktail' of health hazards for 70 per cent of the world's workforce. Workers, especially those in manual jobs, thus need suitably designed policy support and private insurance products to protect their health and incomes from the vagaries of heatwaves, floods, cyclones, etc. Here, an innovative pilot programme by Self Employed Women's Association (SEWA) is noteworthy. Launched in 2023, a heat-linked parametric insurance covering 22,000 unorganised workers entails partial wage payment when temperature breaches 43.6° C with the premium borne partially by the worker and rest through charity. By helping the workers to cover food and medication requirement, the payout provides a shield against the scorching heat. Ultimately, SEWA plans to sign up 29 lakh members which would allow the premiums to be fully funded by the workers themselves.⁵⁵

8.44 To sum up, as the country navigates the complexities of the future job market alongside the global trends, as discussed above, acceptance and adapting to change and encouraging innovation will be the key to harnessing the opportunities and dealing with the challenges presented before us. Dwelling deeper into these trends in the job markets and finding cost-effective solutions through careful planning and implementation would go a long way in mitigating the negative impacts on the job's ecosystem.

51 ILO (2019), Working on a warmer planet: The impact of heat stress on labour productivity and decent work. <https://tinyurl.com/axn9bx8z>

52 Tyagi, Akanksha and others (2021). *India's Expanding Clean Energy Workforce*. New Delhi: Council on Energy, Environment and Water, Natural Resources Defense Council, and Skill Council for Green Jobs.

53 Jobs created are different from the workforce needed, as one worker can perform more than one job.

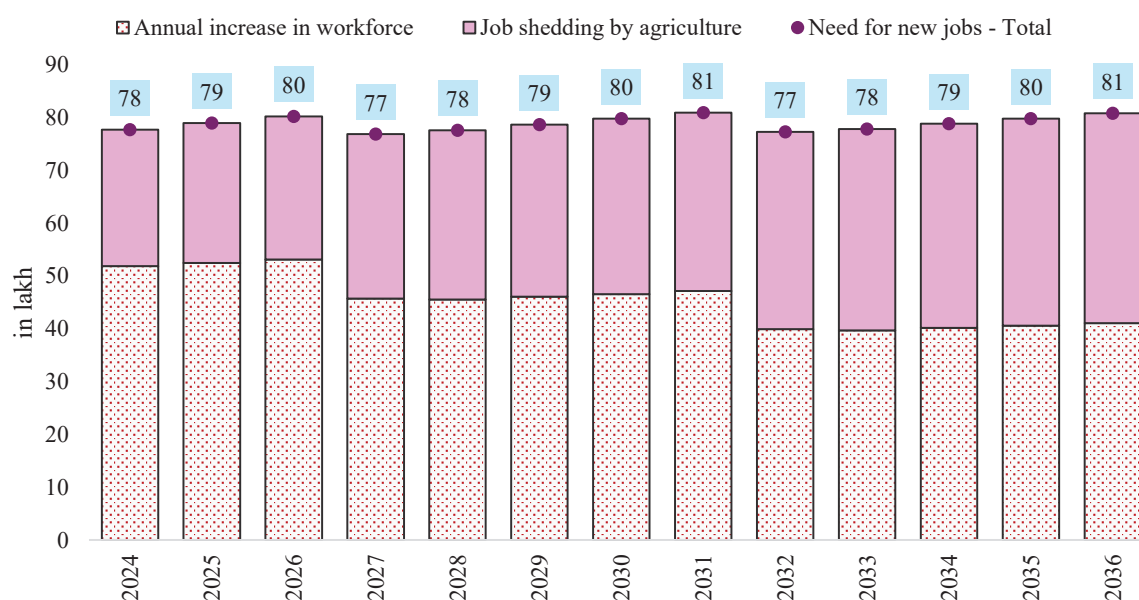
54 Ensuring safety and health at work in a changing climate, ILO, April 2024, <https://www.ilo.org/publications/ensuring-safety-and-health-work-changing-climate>

55 Rathi, A., Economic Times, 12 June 2024, "A 'kavach' helped 46,000 Indian women avoid deadly work during heat waves", accessed on 24 June 2024 <https://tinyurl.com/4asjw7cw>

REQUIREMENT OF JOB CREATION UNTIL 2036

8.45 This section attempts a broad estimation of the requirement for job creation in the non-farm sector, using a simple model and some assumptions. The current workforce in 2022-23⁵⁶ has been estimated using the WPR (usual status, all ages) for 2022-23 from PLFS and the corresponding population estimates by MoHFW.⁵⁷ The rise in workforce has been estimated assuming constant WPR for men (54.4 per cent in 2023) and rising WPR for women (from 27.0 per cent in 2023 to 40.0 per cent in 2036, increasing by 1 percentage point every year).⁵⁸ Further, to account for the structural transformation, it is assumed that the share of agriculture in workforce gradually declines from 45.8 per cent in 2023⁵⁹ to one-fourth in 2047,⁶⁰ and the corresponding workforce thereby leaving agriculture is added to the rise in workforce. This is a reasonable assumption to make given the sticky predominance of agriculture in employment, and the potential of high-value agriculture and allied activities to generate remunerative employment, especially for women. Consequently, Indian economy needs to generate an average of nearly 78.5 lakh jobs annually until 2030 in the non-farm sector to cater to the rising workforce (see Chart VIII.24 below).

Chart VIII.24: Annual requirement for non-farm job creation 2024-2036



Source: Calculated using PLFS, MoHFW population estimates.

⁵⁶ 2022-23 is referred to as 2023 in the section.

⁵⁷ Population estimates as of 1st March have been converted to estimates as of 1st January using linear method, since January is the middle point of the July-June timeframe used by PLFS.

⁵⁸ At this rate, the female WPR will reach 51 per cent by 2047.

⁵⁹ Source: PLFS 2022-23 annual report

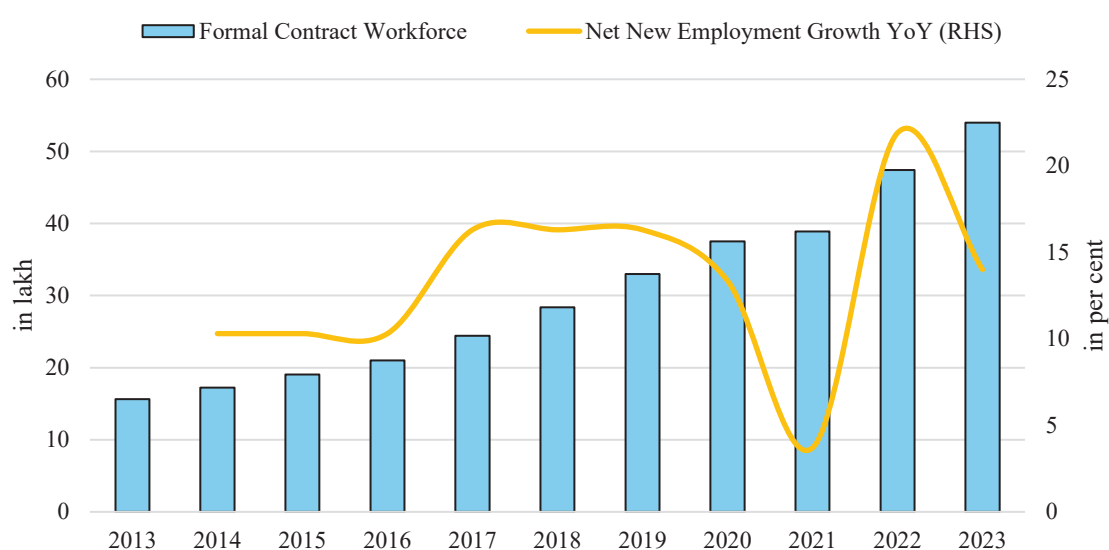
⁶⁰ This implies an yearly decline of 0.87 percentage points.

8.46 To meet the demand of 78.5 lakh jobs in non-farm sector per year, there is scope to supplement the existing schemes of PLI (60 lakh employment generation over 5 years),⁶¹ MITRA Textile scheme (20 lakh employment generation),⁶² MUDRA, etc., while boosting their implementation. In the following sections, two sectors for further job creation have been identified and elaborated upon. Over and above the quantity of employment, its quality and social security aspect has its own significance. The rising employment of flexi workers through staffing companies can be a channel for ensuring social security for informal workers, as briefed in Box VIII.4.

Box VIII.4: Flexi job market in India

There are nearly 5.4 million formal contract staff or flexi workers in India employed through organised contract/temporary staffing companies. These staffing companies are responsible for the timely payout of salaries/wages, social security/medical insurance towards their contract staff. Although they work on a contract, these workers are fully protected with social security, and the average length of contract has been rising with more than 75 per cent of the contracts in 2023 for over six months. The flexi workforce has grown at a CAGR of 13.2 per cent in the decade ending 2023, and remained positive even during the COVID pandemic. However, as a share of the total workforce, the contract staffing workforce is about 1 per cent only, compared to 2.2 per cent in Europe and Asia Pacific. The low percentage of flexi jobs in India indicates that the corporate sector has not replaced full-time workers with flexi workers.

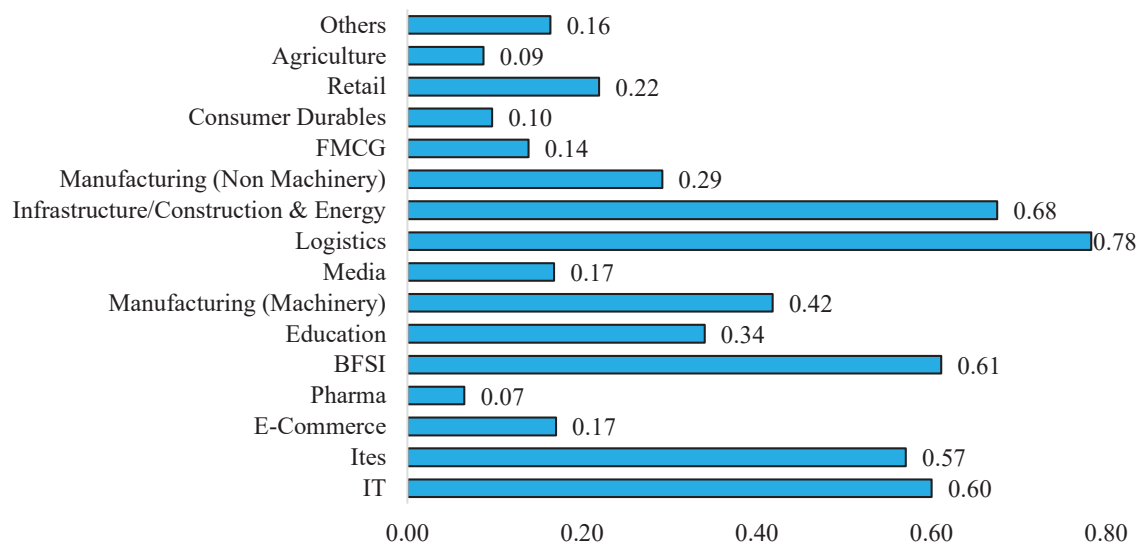
Chart VIII.25: Growth contract staffing workforce in past 10 years



Source: Inputs from Indian Staffing Federation

61 PIB release dated 05 Feb 2024 <https://tinyurl.com/jr5e4m4v>

62 PIB release dated 21 Dec 2023 <https://tinyurl.com/desnm7um>

Chart VIII.26: Sectoral distribution of flexi workforce in million

Source: Inputs from Indian Staffing Federation

80 per cent of the flexi workers are in the 21-30 age group, with an average salary of ₹ 20,000-22,000 a month. Most contract/flexi jobs in India continue to happen at the lower end of the skill spectrum such as data operations, accounts, sales, back-end operations, administration and marketing. Nearly 60 per cent of the flexi jobs are in logistics, infrastructure/construction & energy, BFSI, IT and IT Enabled Services.

AGRO-PROCESSING AS A PROMISING SECTOR FOR RURAL EMPLOYMENT AND GROWTH

8.47 The agro-processing sector lies at the intersection of multiple opportunities for rural growth besides being an intermediate sector for the ‘farm to factory’ transition. The following paras elaborate on the suitability of agro-processing for job creation, given India’s stage of development.

8.48 *Demand for rural jobs:* MGNREGS data shows substantial demand for low-skill rural jobs (especially by women, who constitute more than half of MGNREGS workforce), and there remains ample scope for shifting MGNREGS labour to more productive and less fiscally-straining ventures. Given that agriculture and related industries remain the mainstay of the rural economy, increasing productivity in this sector is imperative to create jobs. Agro-processing can also accelerate crop diversification in areas such as Punjab and Haryana, where paddy cultivation faces serious challenges related to groundwater scarcity.

8.49 *Low value-addition in agriculture:* While India is endowed with 11.2 per cent of total arable land in the world and is ranked first in the production of milk, pulses, and jute, second in fruits and vegetables and third in cereals⁶³-value addition in agriculture continues to be low.

63 Annual Report, MoFPI, 2021-22

As per a study conducted on the Level of Food Processing in India (Deloitte, 2020-21)⁶⁴, the processing level in India is at 4.5 per cent for fruits, 2.7 per cent for vegetables, 21.1 per cent for milk, 34.2 per cent for meat and 15.4 per cent for fishery. In contrast, 30 per cent of food in China is processed as against 60-80 per cent in Western countries (Liu et al. 2007).⁶⁵

8.50 Rising demand for diverse and local food products: A better connection of farmers with food processing units could bring a more extensive and diverse pool of agricultural products to the market, the demand for which has been rising with affluence and diet-consciousness in India and abroad. As per a report by InvestIndia⁶⁶, the Indian food processing market is estimated to reach USD535 billion by 2025, growing at a CAGR of 15.2 per cent. Tier-2 and Tier-3 cities could mirror the trend visible in metropolitan areas by consuming more processed food in the coming years. Further, the share of processed food exports in agri-exports has increased substantially from 13.7 per cent in FY15 to 25.6 per cent in FY23.

8.51 Presence of precedents: There are many success stories to emulate a bottom-up approach to agro-processing, such as the Sahyadri Farmer Producer Company in Maharashtra (refer to Box VIII.5), Araku Coffee plantations by tribals in Andhra Pradesh, Mahagrapes in Maharashtra supported by Mahindra Agro, and Synthites spice-processing group in Kerala.

Box VIII.5: Sahyadri's Success in Agro-processing

Sahyadri Farmer Producer Company (SFPC), an agro-processing unit based in Nashik, Maharashtra, has emerged as a beacon of agricultural innovation and socio-economic development in the region. Boasting more than 12 years of experience in the industry, Sahyadri crossed a remarkable turnover of ₹1000 crore in FY23.⁶⁷ The impressive growth trajectory is attributed to a farmer-centric approach accompanied by a robust supply chain, efficient technology, and world-class infrastructure.

The exponential growth in Sahyadri Farms has led to the creation of 1300 full-time jobs and an additional 4000 seasonal jobs⁶⁸, thus contributing to the region's employment opportunities. With infrastructure spanning over 31,000 acres of land, SFPC holds the status of being India's largest exporter of fresh grapes and processed fruits such as tomatoes, mangoes, sweet corn, and cashew nuts.

The heart of SFPC's ethics lies in its unwavering support for small-scale farmers, with over 95 per cent of associated farmers owning less than one hectare of land.⁶⁹ This not only fosters sustainable agricultural practices but also fuels the rural economy by boosting income levels within local communities.

64 <https://tinyurl.com/4fmx4kjs>

65 Liu, E., Taylor, D., & Zhang, S. (2007). Peoples Republic of China Food Processing Ingredients Sector. GAIN Report. Foreign Agriculture Service, United States Department of Agriculture.

66 <https://www.investindia.gov.in/siru/indian-food-processing-sector-untapped-growth-opportunity>

67 <https://www.sahyadrifarms.com/pr-media-products/sahyadri-farms-crosses-the-1-000-crore-turnover-milestone>

68 Sahyadri Farms Official Website: <https://www.sahyadrifarms.com/>

69 Report by PROPARCO GROUPE: <https://www.proparco.fr/en/actualites/grand-angle/report-india-sahyadri-farms-vines-are-joint-initiative>

In a strategic move to strengthen the value chain for cashews, a vital crop in the region, SFPC has established Maharashtra's largest cashew processing facility at its Mohadi campus in Nashik.⁷⁰ This initiative represents a significant step in improving the value proposition of cashew production in the region. Additionally, Sahyadri has projected that this initiative will facilitate employment for over 300 women in the area, thereby contributing to the social and economic development of the region.⁷¹

8.52 *Avenues for captive demand of agro-processed output:* The local units can supply the Aanganwadis, mid-day meal in schools, while agglomerations can supply urban consumers with rising health consciousness and 'vocal for local' sentiment. Specialised products could be linked to export supply chains, and a national portal listing all such products could be linked to e-commerce entities.

8.53 *Convergence of multiple existing programmes:* The sector can benefit from utilising the synergies between Mega Food Park, Skill India, Mudra, one district-one product, etc., for labour, logistics, credit, and marketing. Such convergence of efforts would immensely benefit from a whole-of-government approach involving gram panchayat, block, and district administration. Organisations such as NABARD, Central Warehouse Corporation, Krishi Vigyan Kendra, etc., could be roped in for prompt handholding and troubleshooting, given their expertise and infrastructure in place. Women's self-help groups could be the foot soldiers in devising and implementing block- or panchayat-level plans, given their credibility, good repayment record, and rising relevance to women in farming.

8.54 Thus, India, being an agriculturally gifted country, can utilise the range of products on offer by its different agro-climatic zones and productively engage the sizeable rural workforce, comprising women who seek remunerative part-time employment and educated youth who can be technically skilled to handle small to medium scale agro-processing units.

CARING OUR WAY TO GROWTH: THE NECESSITY AND PROSPECTS OF A WELL-DEVELOPED CARE ECONOMY IN INDIA

8.55 The care economy is hitherto less known yet potentially significant for economic growth and well-being, especially for a young country like India, which has both demographic and gender dividends to reap. The interconnected dynamics of bolstering a care economy holds the promise of gender equity, human development, and economic growth. Developing a quality and reliable care sector can thus fill a critical efficiency gap in facilitating the best allocation of human resources, driven by comparative advantage and choice rather than dictated by gender. This sub-section explores the contours of the long-term benefits of prioritising care and proposes a few solutions to further develop this sector.

70 <https://agrospectrumindia.com/2023/08/20/nashik-based-fpc-sahyadri-farms-kicks-off-the-biggest-cashew-processing-plant.html>

71 Bhosale, J., 18 August 2023, Economic Times, "Leading grape exporter Sahyadri FPO enters cashew processing sector", <https://tinyurl.com/wd344p4x>

Defining care work - the first step to acknowledging care as ‘work’

8.56 According to the ILO, care work consists of activities and relations involved in meeting the physical, psychological, and emotional needs of adults and children, old and young, frail and able-bodied. Care work falls into two categories: compensated and unpaid/underpaid. Unpaid or underpaid work related to caregiving and providing social support is often performed within households by females and usually consists of childcare, eldercare, domestic work, etc. Paid care work involves labour performed by nurses, caregivers, etc., for remuneration.

Increasing need for a well-developed care economy

Demographic transition – need to prepare for future care requirements of an ageing population

8.57 India’s care needs are slated to expand significantly in the next 25 years, as an ageing population follows the ongoing demographic transition while the population of children stays relatively sizeable. According to the United Nations Population Fund (UNFPA)⁷² as of 2022, one-fourth of India’s population is aged 0-14 years (i.e., 36 crore persons), while one-tenth is above 60 years (i.e., 14.7 crore persons). By 2050, the share of children is estimated to decline to 18 per cent (i.e., 30 crore persons), while the proportion of elderly persons would rise to 20.8 per cent (i.e., 34.7 crore persons). Thus, compared to 50.7 crore persons in 2022, the country would need to care for 64.7 crore persons in 2050. The additional requirements for care would be further upscaled as more women participate in paid work, the rising prevalence of nuclear families⁷³, etc.

Equal opportunity for females – decoupling gender and unpaid care work

8.58 Developing an appropriate care economy is crucial when viewed through the lens of fairness and efficiency of increasing the FLFPR by affording equal opportunity to participate in paid work. This is especially important given the predominant burden of unpaid care work, including domestic work, childcare, and elderly care, falling on women, who are then too “time-poor” to participate fully in employment opportunities. This is a global phenomenon, which holds for India as well. The disproportionate burden of care on women is consequential to the low FLFPR across the world, including India.⁷⁴ According to Sinha et al. (2024), an additional hour of caregiving per day reduces women’s labour market participation by 20 percentage points, with no effect on men.⁷⁵

72 International Institute for Population Sciences and United Nations Population Fund, “India Ageing Report 2023”, https://india.unfpa.org/sites/default/files/pub-pdf/20230926_india_ageing_report_2023_web_version_.pdf

73 The share of nuclear families has been estimated to have increased from 37 per cent of total households in 2008 to 50 per cent of total households in 2022, according to data from a consumer survey company Kantar.

74 United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). (2022). Female Labour Force Participation and Care. Economy in Asia and the Pacific.

75 Sinha, A.; Sedai, AK; Rahut, DB, Sonobe, T. (2024). Well-being costs of unpaid care: Gendered evidence from a contextualized time-use survey in India. World Development, 173, ISSN 0305-750X, <https://doi.org/10.1016/j.worlddev.2023.106419>.

8.59 According to the NSO's Time Use Statistics for 2019, working-age women in India spend 5.6 hours per day on unpaid work, compared to only 30 minutes per day by men. Even women in paid employment spend nearly 6X time on unpaid care work compared to men in paid employment, culminating in the 'double burden' of performing both paid work and unpaid care responsibilities. This care burden-induced professional inequality is in contrast with the rising equality of opportunity in education, with the closing of the gender gap in higher education enrolment in India.

8.60 Specifically, the impact of childbearing and childcare is found to have a significant cost on women's careers, termed the 'motherhood penalty', depicted as a drop in FLFPR around childbearing years and a loss of income. Regarding the quality of employment, the motherhood penalty manifests in women tending to be concentrated in farming and informal jobs, as those workspaces are compatible with their personal care responsibilities (Palriwala and Neetha (2012)).⁷⁶ Even though the time spent on unpaid care work per day is only 9 minutes higher for rural women vis-à-vis urban women, higher rural FLFPR could be explained by the flexibility, in terms of timing and proximity of employment, which allows child supervision, that rural jobs typically provide (Gautham 2022).⁷⁷

Economic potential – generating value by making the best use of human capital

8.61 This unpaid/invisible domestic work performed by women, which is usually neglected while calculating the labour force and the GDP, has been variously estimated as highly valuable yet invisible. A recent report by the Confederation of Indian Industry (CII) uses a standardised input-value method to estimate the economic value of women's unpaid domestic and care work in India as 15 – 17 per cent of GDP.⁷⁸

8.62 The economic value of developing a care sector is twofold – increasing FLFPR (discussed previously) and promoting a promising sector for output and job creation. According to ILO (2018), the care sector is one of the fastest-growing sectors globally, and investments in the care services sector are estimated to generate 475 million jobs globally by 2030. In the case of India, direct public investment equivalent to 2 per cent of GDP has the potential to generate 11 million jobs, nearly 70 per cent of which will go to women.⁷⁹

Multidimensional impact of creches - Empirical evidence

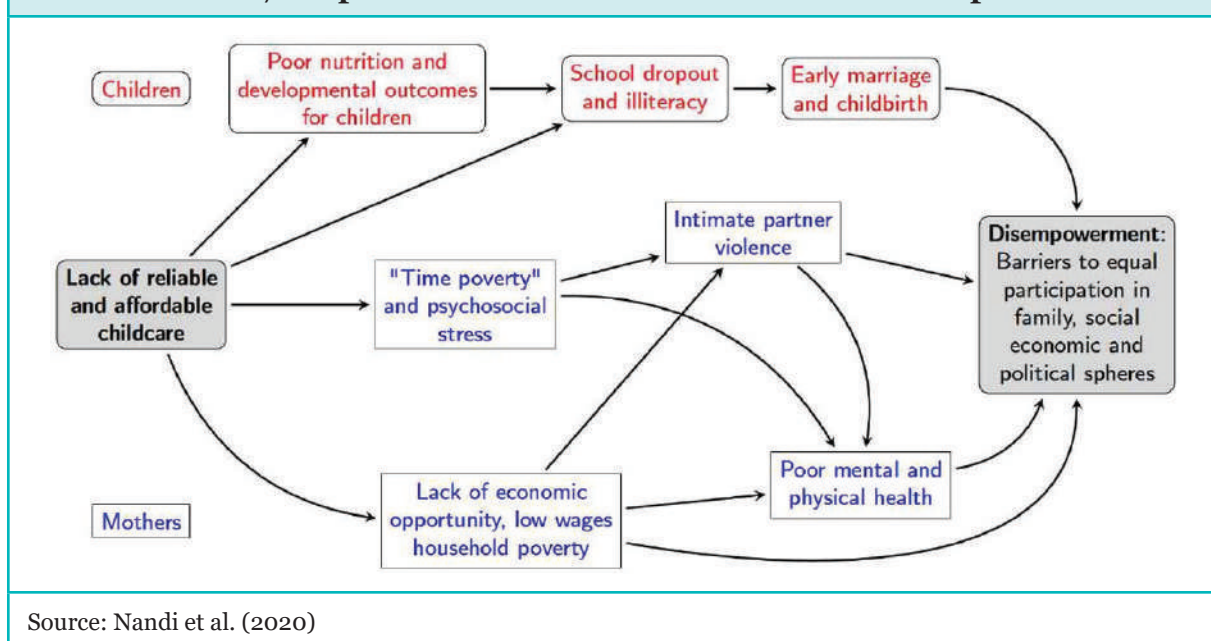
8.63 A wide range of research has emphasised the impact of affordable and reliable childcare on freeing women's time for paid employment, enhancing mental health and improving children's learning and nutrition. That said, the literature is mainly foreign and empirical studies on India are scarce.

76 Palriwala, R. and Neetha, N. 2012. 'Between the State, Market and Family: Structures, Policies and Practices of Care in India', in S. Razavi and S. Staab (Eds.), 'Global Variations in the Political and Social Economy of Care: Worlds Apart' (pp. 176-197), UNRISD UK: Routledge.

77 Gautham, L. 2022. "It Takes a Village: Childcare and Women's Paid Employment in India," Population and Development Review, The Population Council, Inc., vol. 48(3), pages 795-828, September. <https://ideas.repec.org/a/bla/popdev/v48y2022i3p795-828.html>

78 Formulating a Strategy for India's Care Economy: Unlocking Opportunities, March 2024, CII, available at <https://tinyurl.com/4y4eh462>

79 Care work and care jobs for the future of decent work, International Labour Organisation, 2018, https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_633135.pdf.

Chart VIII.27: Impact of lack of access to childcare: A conceptual model

8.64 For example, the availability of public childcare services in Mexico through supply-side and demand-side incentives—such as subsidies to low-income earning women and grants for childcare facilities—had a dual effect on the involvement of women in the labour force. First, low-income mothers received assistance in finding paid employment. Second, the initiative created some 45,000 paid positions for caregivers and their assistants - the majority of whom were women (OECD 2012)⁸⁰.

8.65 In Brazil, children aged 0–3 who live in low-income neighbourhoods could access integrated social, health, and educational services through the Rio de Janeiro Public Day Care programme. According to Barros et al. (2011), the programme had significant impact on female economic opportunities as mothers' employment increased by 27 per cent, and a very high utilisation rate resulted from having access to the programme.⁸¹ While India-specific research on the impact of access to childcare is very limited, some of the studies that examined the situation in India are presented below.

8.66 According to a qualitative study by Mobile Creches NGO in 4 states (Gujarat, Jharkhand, Odisha, Karnataka)⁸² carried out in December 2021- February 2022, 61 per cent of employed women availing creches relied on NGOs, while the share of government-run creches was relatively small (21 per cent). The employed women not availing creches relied mainly on adult family members (41 per cent) and elder daughters (11 per cent). The study found a positive impact of quality creche facilities on women's well-being, income, child well-being, and relationships with family members.

80 OECD. 2012. Women's Economic Empowerment. The OECD DAC Network on Gender Equality (GENDERNET) (Paris)

81 de Barros, R. P., Olinto, P., Lunde, T., & Carvalho, M. (2011). The Impact of Access to Free Childcare on Women's Labor Market Outcomes: Evidence from a Randomized Trial in Low-income Neighborhoods of Rio de Janeiro.

82 Women need Creches, 2022; Rita Mishra, Nirupama Sarathy, Nainy Rao; Mobile Creches, https://ecdan.org/wp-content/uploads/2022/10/MC_WomenNeedCreches_Final-Study-Report_2022.pdf

8.67 A study on SEWA childcare centres⁸³ revealed that beneficiary women could work more hours during the day and more days during the month, leading to higher incomes and savings.

8.68 As per a recent Randomised Controlled Trial in Rajasthan of creches or *Balwadis* run by a local NGO, nearly half of the women offered day care used it. Creches helped reduce malnutrition, decrease stress, and increase the self-reported happiness of mothers (Nandi et al.)⁸⁴

Government Programme: Revamped Palna scheme for creches

8.69 The Anganwadi-Cum-Crèche initiative under the Palna Scheme of the Ministry of Women and Child Development underwent revisions and was included in the Mission Shakti in April 2022. The scheme aims to address the gap that exists mainly in urban areas where support for childcare from family members is not available, and there is a need for institutional support to facilitate the contribution of women to the economy. The Government aims to establish 17,000 Anganwadi-cum-Crèches under the scheme, of which 5222 have been approved as of December 2023.⁸⁵ The scheme can significantly benefit from broader coverage in rural and urban areas.

Senior care reforms in India: Reimagining the senior care paradigm

8.70 As India strives to become a developed economy by 2047, it will also get older. According to the Asian Development Bank's (ADB) 'Ageing Well in Asia' report,⁸⁶ The old-age dependency ratio is expected to rise from less than 20 per cent in 2022 to over 30 per cent by 2050. The care responsibility associated with an increasingly older population necessitates initiating early dialogues around senior care to develop a future-ready elderly care policy.

The rising need for elderly care

8.71 The India Ageing Report 2023⁸⁷ by UNFPA and the International Institute for Population Sciences highlights that a significant portion of the elderly population suffers from chronic diseases, functional limitations, depressive symptoms, and low life satisfaction. As the elderly population is increasingly female and residing in rural areas, feminisation and ruralisation of the elderly are linked with poverty, dependency, and loneliness. The recommendations of the report are as follows.

- Including relevant questions in the National Sample Survey, the National Family Health Survey, and the Census of India to inform evidence-based policymaking.

83 Association for Stimulating Know How (2011), 'SEWA Childcare: Impact Assessment Report for Year 2011'. Gurgaon: India

84 Nandi, Arijit, Parul Agarwal, Anoushaka Chandrashekar, and Sam Harper. 2020. "Access to Affordable Daycare and Women's Economic Opportunities: Evidence from a Cluster-Randomised Intervention in India." *Journal of Development Effectiveness* 12, no. 3: 219–239.

85 PIB release dated 22 Dec 2023 <https://tinyurl.com/yknf7u6d>

86 Ageing well in Asia, ADB Policy Report, May 2024, The report uses Longitudinal Ageing Study in India (LASI) 2017-19 by Ministry of Health and Family Welfare, National Programme for Health Care of Elderly; International Institute for Population Sciences; Harvard T. H. Chan School of Public Health; and the University of Southern California; <https://www.adb.org/publications/asian-development-policy-report-2024>

87 Available at <https://tinyurl.com/5n8rdehz>

- Increasing awareness about existing schemes for older persons, bringing all Old Age Homes under regulatory purview, and encouraging the creation and running of elderly self-help groups.
- Emphasising the importance of elderly people living in multigenerational households. Encourage policies that facilitate and support this living arrangement.
- Encouraging in situ (at home) ageing as much as possible by creating short-term care facilities like creches or day-care facilities.

Need for a wholesome policy for elderly care

8.72 As per a recent position paper on senior care reforms by the NITI Aayog⁸⁸, while the elderly care industry is presently estimated at USD 7 billion (₹57,881 crore), there remain critical gaps in infrastructure, research, and know-how for geriatric illness management, monitoring mechanisms and emergency response systems. India, therefore, needs a structured elderly care policy framework.

8.73 According to the ADB report⁸⁹, the working capacity of older people is a sizeable economic resource. Utilising this ‘silver dividend’ of untapped work capacity of population aged 60-69 years is estimated to increase GDP by an average of 1.5 per cent for Asian economies. The report advocates for age-friendly jobs with a gradual work-to-retirement path encompassing lifelong learning and skill development. From the care perspective, suitable job roles for older population can offer social engagement, financial security, besides reducing the overall care requirement. Box VIII.6 presents some suggestions on building a care economy ecosystem in the country.

Box VIII.6: Building a better care ecosystem

Strategic reforms are required to build a solid structure of the care economy. The reforms could be along the following lines: (i) support for parental leave policies; (ii) subsidies for care services; (iii) public and private investments in building care infrastructure; (iv) mechanisms for skill training for care workers; and (v) mechanisms for monitoring service quality and benchmarks; offers a comprehensive framework for addressing the gender disparities in care and domestic work and boosting women’s labour force participation. Some specific policy interventions could be:

- **Sector Skill Council for Care Services can be set up** to help develop a skill training framework for the care sector, formulate skilling modules, and undertake partnerships with international skill training institutes. There is a need for a dedicated Care Sector Skills Council.

⁸⁸ Niti Aayog paper on “Senior Care Reforms in India - Reimagining the Senior Care Paradigm: A Position Paper”, February, 2024

⁸⁹ Ibid; Note 70.

- **Public-private partnerships (PPP)** could play a significant role in building the care infrastructure, especially institutions for childcare and the elderly. Policies may be formulated to invest in mobile creches in offices, hospitals, and other public areas, encouraging women to take up paid employment opportunities.
- Care services provision, both publicly run or privately operated facilities, would require **institutional oversight and continuous monitoring**. This ensures that the infrastructure is well-maintained and care services are satisfactory. In some countries, there are formal regulatory mechanisms to maintain defined minimum standards of infrastructure and service provision in care facilities.⁹⁰
- **Collaboration with community-based and civil society organisations (CSOs)** can acquaint the system with ground-level reality and help address operational issues with the care infrastructure and financial constraints.
- **Subsidising care services** can be considered. The successful international models of Australia, Argentina, Brazil, and the USA in this sector may offer valuable insights for India. These countries provide financial assistance through vouchers and tax rebates to the care workers based on their income, child's age, number of offspring, etc.
- Owing to the SHGs' strong sense of entrepreneurship, the model of self-managed institutions, for example, Jeevika in Bihar, may be followed to provide a dedicated childcare services programme and a capacity-building programme for care workers.
- Generating awareness about creches to cater to informal workers' latent demand for affordable childcare.
- Ground-level work with community groups and local decision-makers would bring contextualised management innovations for quality and sustainability.
- Developing innovative business models – Start-up India can be leveraged to incentivise commercial and community-based models to pilot and scale up childcare support for women in the informal sector.
- A Rating system of creches and elderly homes – on the lines of OFSTED (Office for Standards in Education, Children's Services and Skills) of the UK.

8.74 The non-government sector has developed innovative solutions for the rising need for elderly care providers. Tata-funded start-up Goodfellows⁹¹ is a leading initiative attempting to tackle the challenge of loneliness, which has been termed as a serious health issue putting individuals at a greater risk of dementia and mental decline.⁹² This start-up hires young people called “grandpals” having emotional intelligence and empathy to interact with lonely senior citizens longing for companionship. It is also an excellent example of strengthening multigenerational communication and understanding, with mutual benefits.

90 For instance, in the United Kingdom, the Office for Standards in Education, Children's Services and Skills (OFSTED) inspects and regulates care services for children and young people. On similar lines, there is a need for institutional mechanisms in India for quality assurance of care service provision.

91 Link to the website: <https://www.thegoodfellows.in/>

92 Mushtaq R, Shoib S, Shah T, Mushtaq S. Relationship between loneliness, psychiatric disorders and physical health? A review on the psychological aspects of loneliness. *J Clin Diagn Res.* 2014 Sep;8(9):WE01-4.

8.75 Other inspiring examples in actualising care ecosystem include Vedanta's comprehensive parenthood policy of 12 months sabbatical for new mothers and flexible working hours after maternity leave by Vedanta Ltd., and the provision of full-time childcare to 3639 children up to the age of six for children of informal women workers under the Sangini Model of the SEWA.⁹³ Internationally, Swedish Government recognition of 'even distribution of unpaid housework and care work' as a policy sub-target is inspiring. Closer home, Haryana's recent crèche policy is notable for being the pioneer among Indian states, as per which working women can keep their child aged six months to six years in the crèche for eight to ten hours where skilled and trained personnel will be deployed.⁹⁴

8.76 To sum up, the care economy is a top-tier entry in India's to-do list for becoming a developed nation by 2047. Not only does the availability of care infrastructure and services reduce women's time poverty and enhance FLFPR, but the provision of care infrastructure and services also acts as a standalone business opportunity, particularly suited for women-led entrepreneurship and women's employment. The care sector thus offers a vast potential for India's economic growth. While the attitudinal shift towards gender-neutral sharing of parental responsibilities would be gradual, policies can accentuate the shift. That requires creating a fair, efficient, and contextual ecosystem of affordable care services. The prevalence of small-scale care models (such as Mobile Creches⁹⁵) for more than half a century suggests that it is possible.

DEVELOPMENTS AND PROGRESS IN SKILLING

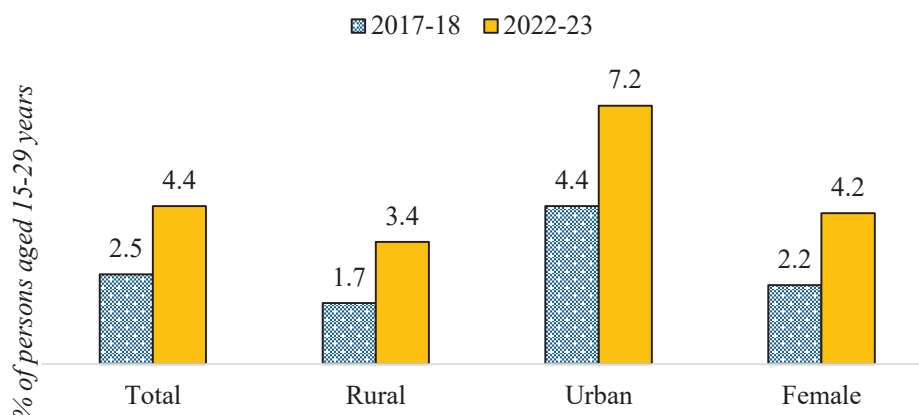
8.77 In order to reap the demographic advantage, it is necessary to equip our workforce with employable skills and knowledge that meet the requirements of the globalised labour market and Industry 4.0. Measures are being taken by Government to translate India's demographic dividend into a productivity dividend by enabling job and entrepreneurial opportunities that are in sync with the aspirations and abilities of India's youth. It is partnering with the industry to enhance skilling with employability (See Box VIII.7).

8.78 Over the period 2017-18 to 2022-23, there is a significant improvement in the proportion of skilled people across all socio-economic classifications, including rural, urban and gender classification, as indicated in Chart VIII.28. According to the Periodic Labour Force Survey (PLFS) report 2022-23, 4.4 per cent of the youth in the age cohort of 15-29 years have received formal vocational/technical training, while another 16.6 per cent received training through informal sources.

93 Confederation for Indian Industry (2024). Formulating a Strategy for India's Care Economy: Unlocking Opportunities.

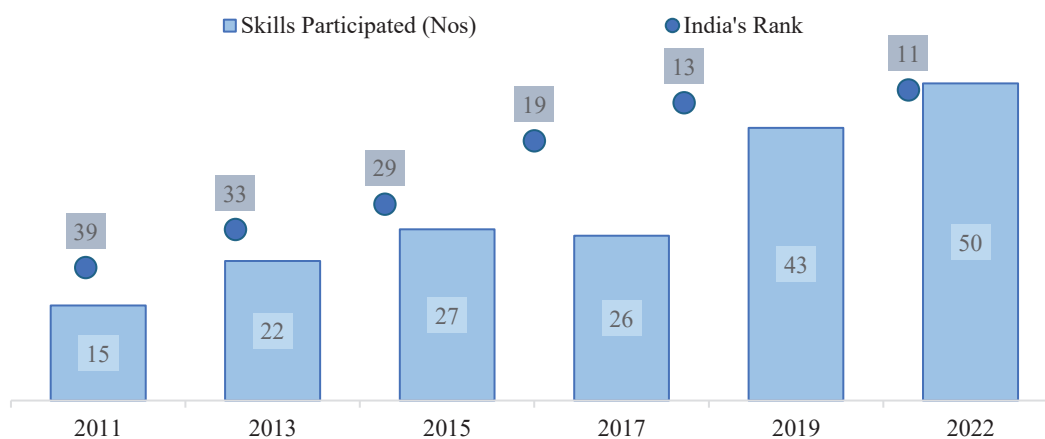
94 Notification-Haryana State Creche Policy 2022 | Women and Child Development Department, Haryana | India (wcdhry.gov.in)

95 Link to the website: <https://www.mobilecreches.org/>

Chart VIII.28: Rise in the percentage of persons aged 15-29 years who received formal vocational/technical training


Source: Annual Report 2022-23, Periodic Labour Force Survey, NSO

8.79 The recent launch of the Skill India Digital platform⁹⁶ aimed at achieving skilling, education, employment, and entrepreneurship ecosystem marks another step towards the “ease of acquiring skill” in India. The rise in the number of candidates undergoing skill development through the Government’s flagship programmes has underlined the thrust to ‘Skill India’, as highlighted in Table VIII.2. The across-the-board progress in skilling has manifested in India’s rising position in WorldSkills Competitions, held every two years.⁹⁷

Chart VIII.29: India at WorldSkills competition


Source: MSDE Annual Report 2022-23

96 <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1957139>

97 The WorldSkills Competition, a flagship event of the WorldSkills International, organised every two years, is the biggest vocational education and skills excellence event. WorldSkills competition 2022 was conducted by WorldSkills International from September to November 2022 across Europe, North America, and East Asia comprising over 1,000 competitors from 58 countries in 61 skills. India participated in 50 Skills (including 6 new future skills) with 56 Competitors and 50 Experts, spanning over construction and building technology, creative arts and fashion, manufacturing and engineering technology etc. More than 1000 contestants below the age of 23, compete over a span of four days working on test projects (16-22 hours) which are based on contemporary industry standards and infrastructure.

Various schemes for skilling

8.80 The details of progress in some flagship government schemes are mentioned below.⁹⁸ Box VIII.7 elaborates the promotion of industry's involvement in skill programmes.

Table VIII.2: Progress of skill development programmes

Schemes under MSDE	Overall Progress
Pradhan Mantri Kaushal Vikas Yojana (PMKVY) <i>free short-duration skill training and certification</i>	Since the scheme's inception in 2015, 1,42,67,888 persons have been trained, and 1,13,72,668 persons have been certified under its Short-Term Training (STT), Special Projects (SP) and Recognition of Prior Learning (RPL) components. <ul style="list-style-type: none"> • Reforms undertaken for greater relevance and industry connect • Compulsory inclusion of On-the-Job Training in short-term training courses • 1,000+ educational institutions nationwide have been on-boarded as Skill India Centres. • 119 new age and future skill courses were introduced across eight sectors. • Entities without permanent vocational infrastructure were eliminated from the training ecosystem. • Inclusion of 'Employability Skills' in all qualifications. • Under PMKVY, the participation of women among those trained has increased from 42.7 per cent in FY16 to 52.3 per cent in FY24.
Craftsmen Training Scheme at Industrial Training Institutes (ITIs) <i>Vocational training through a network of 14,955 ITIs</i>	<ul style="list-style-type: none"> • 1.24 lakh persons enrolled in long-term training between 2014 and 2023 • In sphere of long-term skilling, i.e., in ITIs and National Skill Training Institutes (NSTIs), women participation has gone up from 9.8 per cent in FY16 to 13.3 per cent in FY24. New Grading Mechanism for ITIs <ul style="list-style-type: none"> • Data-driven grading Methodology (DDGM), using the parameters/information available on the NCVT MIS portal, implemented from session 2023-24
Jan Shikshan Sansthan (JSS) <i>For skilling of non/neo literates and persons with a rudimentary level of education</i>	<ul style="list-style-type: none"> • From FY19 to FY24, 26,36,769 persons have been trained, and 24,94,807 persons have been certified. <i>Capacity Building of Jan Shikshan Sansthan (JSS)</i> <ul style="list-style-type: none"> • Setting up 30 Model JSS by upgrading the laboratories with new-age equipment, training 150 trainers

⁹⁸ Source: Inputs received from Ministry of Skill Development and Entrepreneurship

Schemes under MSDE	Overall Progress
Jan Shikshan Sansthan (JSS)	<ul style="list-style-type: none"> ● Capacity building of the staff in management, communication skills, etc. ● Under JSS, women constituted about 82 per cent of the total beneficiaries.
National Apprenticeship Promotion Scheme (NAPS) <i>To promote apprenticeship training by reimbursing a partial stipend</i>	<ul style="list-style-type: none"> ● 32.38 lakh apprentices engaged between FY17 and FY24. ● NAPS portal: Rise in the number of registered 'Establishments' from 17,608 in March 2017 to 2.21 lakh till March 2024 ● Under NAPS, participation of women has increased from 7.74 per cent in 2016-17 to 20.77 per cent in 2023-24. ● Direct Benefit Transfer of Apprentices Stipend Support <ul style="list-style-type: none"> □ NAPS-2: Reimbursement of 25 per cent of the stipend (up to ₹1,500) directly to the Bank a/c of the Apprentices □ ₹320.88 Crore released as stipend through 22.46 lakh transactions since launch in August 2023 till March 2024
Entrepreneurship Training	<ul style="list-style-type: none"> ● The National Institute for Entrepreneurship and Small Business Development (NIESBUD) provided training in the field of Entrepreneurship for 3.21 lakh beneficiaries between FY19 and FY24. ● Indian Institute of Entrepreneurship (IIE), Guwahati, provided training and handholding services to 1.43 lakh beneficiaries between FY19 and FY24. <ul style="list-style-type: none"> □ IIE was the nodal entity that provided livelihood support to more than 1.78 lakh beneficiaries under projects like Pradhan Mantri Van Dhan Yojana, OIL Jeevika, SFURTI, etc.
Skill India Digital Hub platform <i>Convergence platform facilitating access to skilling, credit, and employment through AI/ML technology.</i>	<ul style="list-style-type: none"> ● Launched in August 2023 ● Integration of skilling schemes, 690 online courses, 1650 QP-based e-books, eShram/EPFO/NCS, Udyam, DigiLocker, GatiShakti, UMANG, AgriStack, PLI Schemes, ODOP, etc. ● Registration of 60 lakh learners and 8.4 lakh app downloads
New Age and Future Skills	<ul style="list-style-type: none"> ● NCVET approved 200+ new age and future skill courses during the year ● Collaboration with Delhi University to offer 100 new-age skill courses and labs at various Colleges ● 23 new age courses introduced at ITIs. Guidelines for selecting at least one 'New Age' course out of 4 courses for affiliation of new ITIs.

Schemes under MSDE	Overall Progress
<i>International Mobility</i>	
G2G MoUs	MoUs with eight countries, namely Australia, Denmark, France, Germany, Japan, Qatar, UAE, and the UK, for cooperation in Information Exchange, Standard Setting, Mutual Recognition of Qualifications, etc.
Skill India International Centres (SIIC)	<ul style="list-style-type: none"> • Budget FY24 announced the setting up of 30 SIICs • Two centres at Varanasi and SDI Bhubaneswar have been made operational • Locations of the rest of the SIICs have been finalised, and seven centres will soon be set up under phase 1.
NSDC International Limited <i>Set up in 2021 for ethical and transparent international recruitment of skilled Indians.</i>	<ul style="list-style-type: none"> • Drives the Skill India International Mission focusing on priority sectors such as Information Technology, Construction, Hospitality, etc. • 20 NSDC-affiliated training centres for capacity building, 12 centres to provide language training • Efforts resulted in the deployment of over 26,000 candidates across multiple countries.
<i>Targeted Skilling beyond MSDE Schemes</i>	
Jal Jeevan Mission	Overall guidance and coordination of the multi-skilling course by MSDE
PM Vishwakarma	Basic' and 'Advanced' skill training of Vishakarmas, including usage of modern toolkits by MSDE
Green Hydrogen	Development of 50 new short-term qualifications for skilling, upskilling and re-skilling
PM-JANMAN	<ul style="list-style-type: none"> • Entrepreneurship and Skill Development, capacity building and handholding of identified PVTG beneficiaries by NIESBUD and IIE • Capacity building training of 5096 beneficiaries till March 2024, expected to reach 44,608 beneficiaries by 2025-26
Special Skill Provisions for Agniveers	<ul style="list-style-type: none"> • DGT has signed MoUs with Army, Navy and Airforce • Skill certification of Agniveers based on their qualification and experiential learning to ensure employment opportunities in industries after service of 4 years • Agniveer service modules: Basic Military Training; Trade Training; Security Training and Service/OJT

Box VIII.7: Partnering with industry for skilling

Industry connection is crucial to any large-scale skilling programme, enabling contemporary relevance and employability and ascertaining demand to absorb the newly skilled workforce. In cognisance of this, the Skill India mission actively collaborates with the industry through National Skill Development Council (NSDC)-driven partnerships for skill development, reskilling, and upskilling. Until March 2024 (starting date to be added), 131 projects have been undertaken by NSDC, with 62 corporate organisations benefitting over 3.10 lakh persons across the country, including 42 aspirational districts.

Skill Impact Bond

Launched in 2021, the Skill Impact Bond leverages an innovative and results-based finance mechanism - Development Impact Bond⁹⁹ model to attract private sector funds and expertise for skill development, job placements, and retention. This initiative by NSDC and its coalition partners¹⁰⁰ targets training 50,000 youth, ensuring at least 60 per cent are female, through selected and monitored NSDC-affiliated training partners over four years. Between November 2021 and March 2024, 29,365 candidates have been enrolled over five cohorts, 23,464 have been certified, 19,209 have been placed and 13,853 reported job retentions. The program has reported 74 per cent women enrolment so far.

Further, the Directorate General of Training (DGT) has also taken the following initiatives under Industry Partnerships:

- Under the **Flexi MoU Scheme** with prominent industry partners such as Maruti Suzuki India Limited, Gurugram, NMDC Chhattisgarh, Toyota Kirloskar Motor Pvt. Ltd, etc. - about 9600 trainees have been trained under this initiative from March 2019 to March 2024.
- Under the **Dual System of Training (DST)** initiative, skilling institution trainees get first-hand workplace experience. During the 2022 session, about 978 ITIs and 37,865 trainees were covered under DST.
- **DGT has collaborated with IT frontlines** like IBM, Microsoft, Cisco, Adobe, Amazon Web services, etc., to enable trainees to become Industry Ready as per IR 4.0, and more than 21.5 lakh trainees have been trained under these collaborations between November 2019 and March 2024.
- Besides mandated training of Instructor trainees, NSTIs are also **Skilling/Re-skilling/ Upskilling the existing industry workforce** by partnering with ISRO, ONGC, Indian Railways, Naval Ship Repair yard, Naval Ship Dockyard, and BHEL. Under this initiative, about 1400 participants were trained during the FY24 session.

⁹⁹ Impact bonds shift the focus from inputs to performance and results. Rather than a government or a donor financing a project upfront, private investors initially finance the initiative and are repaid by 'outcome funders', only if agreed-upon outcomes are achieved. This mechanism creates incentives for every partner to achieve learning outcomes and not just deliver services.

¹⁰⁰ Partners comprise of the Children's Investment Fund Foundation (CIFF), JSW Foundation, HSBC India, and Dubai Cares as outcome funders, the British Asian Trust as the transaction manager, USAID and FCDO (UK Government) as technical partners, Oxford Policy Manager as the independent evaluator, and NSDC and Dalberg Advisors as performance managers. NSDC and MSDF are the risk investors that have committed \$4 million to provide upfront working capital to the service providers.

- **DGT is also collaborating with industry partners for infrastructure development/upgradation** in NSTIs/ITIs. Notable collaborators include Dassault for Aeronautical Structure and Equipment Fitter, Pidilite and Jaguar for the Plumbing sector, Skoda for the automobile industry, and HAL and Siemens for advanced CNC machinery training, among others.

8.81 The PM Vishwakarma scheme to provide end-to-end support to artisans and craftspeople is a new scheme (briefed in Box VIII.8) to address various constraints of artisans to upgrade their enterprise, thus infusing the traditional vocations with dynamism.

Box VIII.8: PM Vishwakarma Scheme: Making progress

The PM Vishwakarma programme was launched in September 2023 for recognition, skill upgradation, collateral free credit and marketing support to traditional artisan/craftsperson working with traditional tools. 18 trades are covered under PM Vishwakarma Scheme, including tailors, barbers, masons, carpenter, blacksmith, basket weaver, potter, cobbler, traditional toys maker, fishing net maker, etc. It is a Central Sector Scheme with practically useful components including recognition through PM Vishwakarma Certificate and ID Card, Skill Upgradation, Toolkit Incentive, Credit Support, Incentive for Digital Transactions and Marketing Support. Under the skill upgradation module, 5-7 days of basic skill training and advanced 15 days optional skill training is provided with stipend of ₹ 500 per day to offset wage loss and a travel allowance of ₹ 1000.

Currently 1,533 Centres covering 365 districts in 25 states/UTs are implementing training and additional 2000 centres are ready. For ease of credit, two bank officials each in all the 766 districts on pan India basis have been designated for information on know-how of availing credit under the scheme to the registered Vishwakarma. As on 27th May 2024, 2.14 crore applications have been received and 11.5 lakh have been verified through a 3-level verification, showing the latent demand for the scheme. 4.37 lakh candidates have been trained/undergoing training under the programme.

8.82 To maximise the outcomes from skilling initiatives, convergence, and utilisation of synergies with other employment-centric programmes would mutually benefit the two verticals. Linking skill development with PLI scheme and employment-linked incentive schemes in high-growth potential sectors like toy, apparel, tourism, logistics, textiles, leather sector etc. would aid upgrading of skills as production moves up the value chain. On the apprenticeship promotion front, there remains considerable scope to add flexibility to the regulatory framework, as elaborated in Box VIII.9.

Box VIII.9: Re-calibrating the apprenticeship framework

Learning while doing has been considered the best way of learning and this is the best way to bridge the gap from theory to practice. In the manufacturing /industry parlance, it is termed “apprenticeship” and in the knowledge-based professions it goes by “internships”. Such learning opportunities act as the bridge that aids people to cross over from informal work to formal employment or to smooth the move from academics to the workplace. They are an essential component of the skilling ecosystem which is the backbone for both employment and entrepreneurship.

The Apprentices Act, 1961 (Act) provides for establishments in all sectors of manufacturing and services with more than 30 employees to mandatorily undertake apprenticeships in a range from 2.5 - 15 per cent of their workforce¹⁰¹. Any person over the age of 14 years and with a minimum education of 5th standard is eligible to take up apprenticeship. The Rules provide 6 – 36-month duration apprenticeship programmes with a minimum stipend of ₹5000 - 9000 per month to apprentices and the rate is linked to the educational qualification of the candidate. The Act and the Rules have been amended in 2014, 2015, and 2019, to make it more liberal for establishments and apprentices.

The National Apprenticeship Promotion Scheme¹⁰² (NAPS) was introduced in August 2016 to meet the demand for a skilled workforce, promote the industrial economy, and provide experiential learning opportunities to the youth. The scheme governs the engagement of apprentices under the Act and is funded 100 per cent by the Ministry of Skill Development and Entrepreneurship. It incentivises establishments by reimbursing 25 per cent of the prescribed stipend (subject to a maximum of ₹1500 per month) and also partially supports the cost of basic training. The scheme covers apprenticeship in over 261 designated trades, managed through the Director General of Training and the state Governments, and over 200 optional trades, managed by the NSDC, in over 37 industry sectors. Under the scheme¹⁰³, over 2.21 lakh establishments are registered for taking up apprentices and over 32.38 lakh apprentices have been engaged from FY17 to FY24.

While the NAPS supports apprentices who have minimum formal education the National Apprenticeship Training Scheme¹⁰⁴ (NATS) covers Graduate, Diploma students and Vocational certificate holders for practical, hands-on On-the-Job-Training based skilling opportunities with a duration ranging from 6 months to 1 year. The scheme, implemented by the Ministry of Education, has over 43,000 registered establishments and 28.66 lakh students who have been engaged under the scheme. It supports 50 per cent of the cost of such apprenticeship stipend to the establishments.

101 FAQs – Apprenticeship under the Apprentices Act, 1961 accessed at <https://nsdcindia.org/sites/all/themes/ibeas/pdf/apprenticeship-faqs.pdf>

102 Guidelines for Implementation of National Apprenticeship Promotion Scheme-2 (NAPS-2) accessed at file:///C:/Users/Dell/Downloads/NAPS+2.0_Guidelines_25-08-2023.pdf

103 NAPS Dashboard accessed at <https://dashboard.apprenticeshipindia.org/>

104 Content as accessed at :: National Apprenticeship Training Scheme (NATS) :: (education.gov.in).

Challenges

Apprenticeship training programs in India have the potential to bridge the skills gap in the workforce and enhance the employability of vocational students. Empirical evidence shows that, in a smooth functioning apprenticeship ecosystem, a large share of firms (30 per cent in Germany and 60 per cent in Switzerland) recoup their investment of hiring an apprentice by the end of the training period, while being guided by their cost-benefit analysis in hiring apprentices (Muehleemann and Wolter 2014).¹⁰⁵ Firms also retain the most eligible apprentices while the others seek employment elsewhere.

There exist significant challenges in the Indian apprenticeship ecosystem, such as lack of coordination between education institutions and industry, inadequate infrastructure, gaps in the regulatory framework (Ravichandran 2023).¹⁰⁶ Besides, the negative perception of vocational training as being inferior to academic education is one of the biggest challenges (Gupta and Dharap 2022).¹⁰⁷

The outcomes from the apprenticeship schemes signal scope for improvement. The NAPS 2.0 set an ambitious target of enrol 46 lakh apprentices in the four years from 2022-23 to 2025-26, whereas the enrolments from 2016-17 to 2021-22 were 15.96 lakh. The technological intervention of having a unified portal and moving payments to the direct benefit transfer system may have helped increase enrolments from 2.90 lakh in FY 21 to 5.80 lakh in FY 22 but few systemic weaknesses need to be addressed if the target is to be achieved. Of more concern is that less than 50 percent of apprentices engaged have completed training. There is a lack of information on the final outcome of gainful employment for the trainees. Only around 47,000 of the 2.21 lakh establishments have active programmes, indicating a need to generate employers' interest in apprenticeship.¹⁰⁸

The apprenticeship framework thus needs to be re-calibrated to provide flexibility and negotiability in work hours, compensation, and disengagement, emulating the Swiss and German models of apprenticeships where students work as apprentices on weekends on mutually agreeable terms. The regulatory framework needs to be mindful of the cost-benefit ratio of hiring apprentices for local firms. As it stands, apprentices' productivity and working hour may vary and flexibility in the contract terms could enable mutually beneficial arrangements rather than closing doors for any engagement. There is a need to minimise the role of Government agencies in order to address the delays in the programme and ease the compliance requirements of establishments. Establishing a mechanism to convert the skills acquired at apprenticeships into gainful employment by networking between registered establishments and industry clusters, forward linkages with entrepreneurship schemes etc. would also be useful. Operationalising the matching of opportunities and demand at local levels such as a district or satellites areas of cities, etc., would improve outcomes.

¹⁰⁵ Muehleemann, S., Wolter, S.C. Return on investment of apprenticeship systems for enterprises: Evidence from cost-benefit analyses. *IZA J Labor Policy* 3, 25 (2014). <https://doi.org/10.1186/2193-9004-3-25>

¹⁰⁶ Ravichandran, R., 2023, Bridging the Gap: The Role of Apprenticeship Training Programs, *Journal of Vocational Education Studies*, Vol. 6, No. 1, May 2023 DOI: <https://doi.org/10.12928/joves.v6i1.8006>

¹⁰⁷ Gupta, R., & Dharap, O. (2022). How is India skilling its youth? A comprehensive study. *Journal of Vocational Education & Training*, 1-27.

¹⁰⁸ <https://dashboard.apprenticeshipindia.org/>

According to Gayathri et.al.(2019), in the short term, it is important to gather statistical data to understand the working of the apprenticeship scheme in different sectors and regions. This data will help estimate the number of apprentices that can be absorbed by industries and workplaces. In the long run, the focus should be on effective implementation by raising awareness, incentivising industries, and engaging key stakeholders.¹⁰⁹

The large share of the informal sector in employment is both a challenge and an opportunity. Interventions targeting skill development and upskilling in the informal sector can lead to an increase in productivity in these jobs and improve earnings for the cohort of unskilled and semi-skilled workforce. Strengthening and recalibrating the apprenticeship framework can be the means to make effective use of this opportunity.

CONCLUSION AND WAY FORWARD

8.83 To sum up, the employment situation in India has experienced a positive transformation over the last decade, with notable achievements in formalisation, skill development, entrepreneurship, industry diversification, and inclusive growth. These trends and the country's commitment to technological advancement and infrastructure development have positioned India as a dynamic and resilient player in the global job market. The Government is striving to nurture the foundations of employment creation by creating an ecosystem of ease of doing business, lower logistical costs, meaningful skill development, and easy credit for entrepreneurship. This approach may take some time to bear results, but with steadfast efforts and good intentions, it will facilitate sustainable employment creation for everyone in the country.

8.84 Nevertheless, there remain long-existing challenges of formalising a burgeoning workforce, facilitating job creation in sectors which can absorb workers shifting from agriculture, and ensuring social security benefits for those in regular wage/salaried employment (as per PLFS 2022-23, 53 per cent of regular wage/salaried employees are not eligible for any social security benefit). The state governments can grease the wheels of hiring by businesses by easing the compliance burden and reforming laws on land, etc., to suit the priorities of development.

8.85 The agro-processing sector lies at the overlap of India's requirements of productive, intermediate, and large-scale job creation for rural youth and women, with rich dividends to reap from the convergence of schemes and a mission-mode unwavering focus at a national scale. The Sahyadri farmer producer company is a shining example from a long list of success stories.

8.86 Concurrently, the employment landscape is fast changing worldwide, and India, aspiring to be a developed nation by 2047, must partake in the massive reshaping of jobs that AI has and is likely to further spin off. The impact of automation on workers being complex and uncertain, the direction of technological change remains susceptible to forces of political economy. India thus needs to invest in research and steer the AI bandwagon towards shared prosperity. At the same time, something as basic and age-old as unpaid care work needs our attention too. The

¹⁰⁹ Gayathri, K., Tantri, M.L., Rajashekhar, D., 2019 "A Critical Review of Apprenticeship Policy in India", The Institute for Social and Economic Change, Bangalore, Working paper 440, ISBN 978-81-7791-296-8.

development of an affordable, reliable, and quality creche and elderly care infrastructure is the Achilles heel for female participation in paid work, which should be determined by comparative advantage and choice rather than dictated by gender.

8.87 Finally, jobs are created in the private sector. India's corporate sector has never had it so good as now, with profitability at a 15-year high in FY24. Profits had quadrupled between FY20 and FY23. Businesses are sometimes reluctant to make investments citing lack of demand visibility. This could be due to external factors and internal factors such as weak employment growth and income growth. To that extent, the lack of demand visibility is an endogenous factor. Privileging capital over labour is inimical to long-term corporate growth prospects. Businesses have an obligation to themselves to strike the right balance between deployment of capital and deployment of labour. As important, capital and labour shares of income have to be fair. In their fascination for AI and fear of erosion of competitiveness, businesses have to bear in mind their responsibility for employment generation and the consequent impact on social stability.

8.88 With respect to skilling too, it is a priority that lends itself to market-based solutions. There is a skill-seeker who benefits economically from better skills; there is a skill-provider who earns fee income for imparting it and there are employers who benefit from a skilled and productive workforce. Therefore, it is a challenge that the market can solve and to the extent that regulatory hurdles (including, for example, land availability for setting up skilling facilities) stand in the way of the market solving this problem, that is the responsibility of the Governments – union and states – to remove them.

8.89 This chapter has provided a broad estimate of the number of jobs that the economy has to generate. Of course, not all of them will seek jobs. Some of them will be self-employed and some of them will be employers too. More than jobs, economic growth is about generating livelihoods. Technological change, geopolitical churn and climate change combine to make this a formidable challenge. Rising to it requires us – Governments at all levels and the private sector – to strive together.

AGRICULTURE AND FOOD MANAGEMENT: PLENTY OF UPSIDE LEFT IF WE GET IT RIGHT

09

CHAPTER

In the last five years, the agriculture sector has grown at an average growth rate of 4.18 per cent per year. The country also has a comfortable stock of foodgrains, around 40 per cent¹ of which is distributed to two-thirds of the population free of cost. India exports more than 7 per cent² of its food grains. The growth in the agriculture and allied sectors has contributed positively to the growth of the Indian economy.

However, specific challenges remain. Low productivity levels, the impact of variability in weather, fragmented land holdings and inadequate marketing infrastructure affect agriculture performance. The chapter discusses these aspects while also focussing on government interventions in the crop, livestock, animal husbandry and fisheries to enhance investment and productivity, provide reasonable returns to farmers through the minimum support price (MSP), improve access to high-quality inputs and enable better extension services. Looking ahead, the digitalisation initiatives in Agriculture are expected to empower farmers through better decision-making tools. The chapter also discusses welfare schemes like PM Gareeb Kalyan Yojana (PMGKAY), the National Food Security Act (NFSA) and India's food management programme, including food procurement and allocation.

INTRODUCTION

9.1 The Indian agriculture sector provides livelihood support to about 42.3 per cent of the population and has a share of 18.2 per cent in the country's GDP³ at current prices. The sector has been buoyant, which is evident from the fact that it has registered an average annual growth rate of 4.18⁴ per cent at constant prices over the last five years. Several initiatives and measures taken by the government in the form of assured remunerative prices through MSP improving access to institutional credit, enabling crop diversification, promoting digitisation, and mechanisation, encouraging adoption of sustainable practices through organic and natural farming, and focusing on productivity enhancement have had a positive impact on the sector. As per provisional estimates for 2023-24, the growth rate of the agriculture sector stood at 1.4

1 Chand, R., Joshi, P., & Khadka, S. (2022). Indian agriculture towards 2030: pathways for enhancing farmers' income, nutritional security and sustainable food and farm systems (p. 311). Springer Nature link available at <https://link.springer.com/book/10.1007/978-981-19-0763-0>

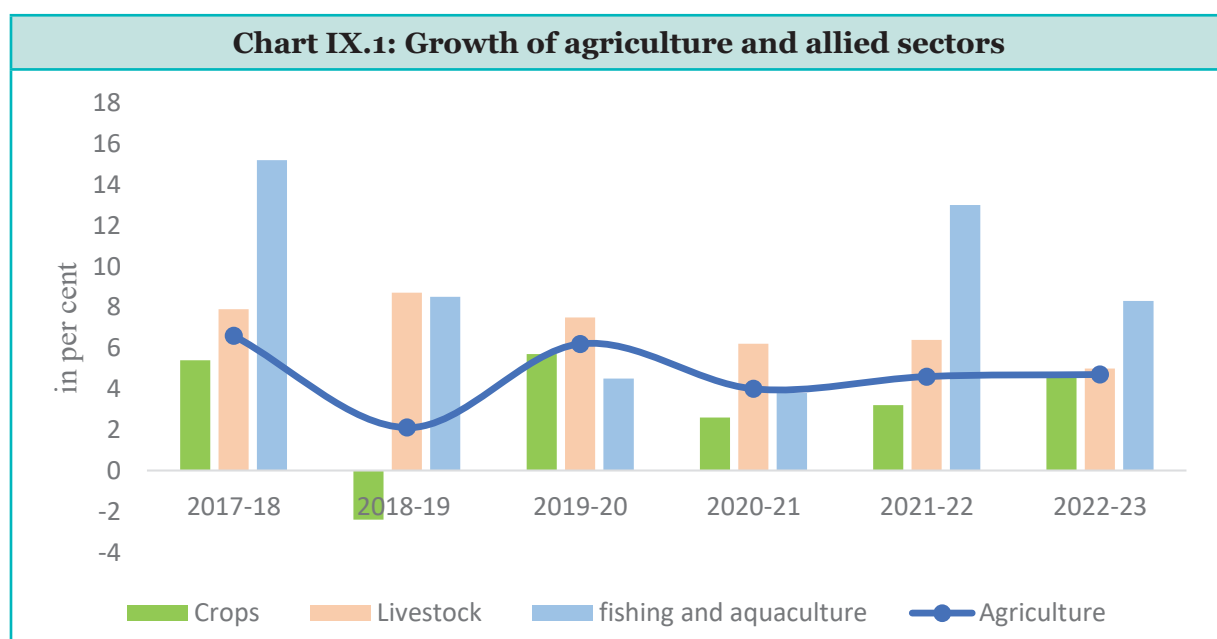
2 Ashok Gulati and Ritika (2022) Indian agriculture towards 2030: pathways for enhancing farmers' income, nutritional security and sustainable food and farm systems (p. 311). Springer Nature link available at <https://link.springer.com/book/10.1007/978-981-19-0763-0>

3 National Statistical Office (NSO) M/o Statistics & Programme Implementation

4 ibid

per cent,⁵ which is below 4.7 per cent in 2022-23⁶, mainly because of a drop in the foodgrain production due to delayed and poor monsoons caused by El Nino. The allied activities - livestock and fisheries have performed better than the traditional crops such as cereals⁷, which is evident from an increase in their share in agriculture Gross Value Added (GVA) at current prices from 24.38 per cent and 4.44 per cent in 2014-15 to 30.23 per cent and 7.25 per cent in 2022-23⁸ respectively. The share of the crops sector in Agriculture GVA at current prices in 2022-23⁹ was 55.28 per cent as compared to 61.75 per cent in 2014-15.

9.2 While the country is a major agriculture producer, being the second largest producer in rice, wheat, cotton, among other crops, and the largest producer of milk, pulses and spices¹⁰, the crop yields in the country are much lower than the other major producers (Fig IX.2). That this is so despite the fact that the bulk of the government support goes to rice and wheat if a cause for reflection. Fragmented land holdings, low farm investment, lack of farm mechanisation, insufficient access to quality inputs, and inadequate marketing infrastructure leading to post-harvest losses, dependency on rains and short growing seasons are a few reasons for the low yields.



Source: National Statistical Office (NSO) M/o Statistics & PI

9.3 Several interventions are being undertaken to improve productivity in agriculture in line with the recommendations of the Doubling Farmers Income Report (DFI) 2016, which identified strategies to increase crop and livestock productivity, enhancing cropping intensity, diversify to high-value agriculture and provide remunerative prices on farmers' produce. The decision in 2018-19 to fix MSP at one and half times the all-India weighted average cost of

⁵ *ibid*

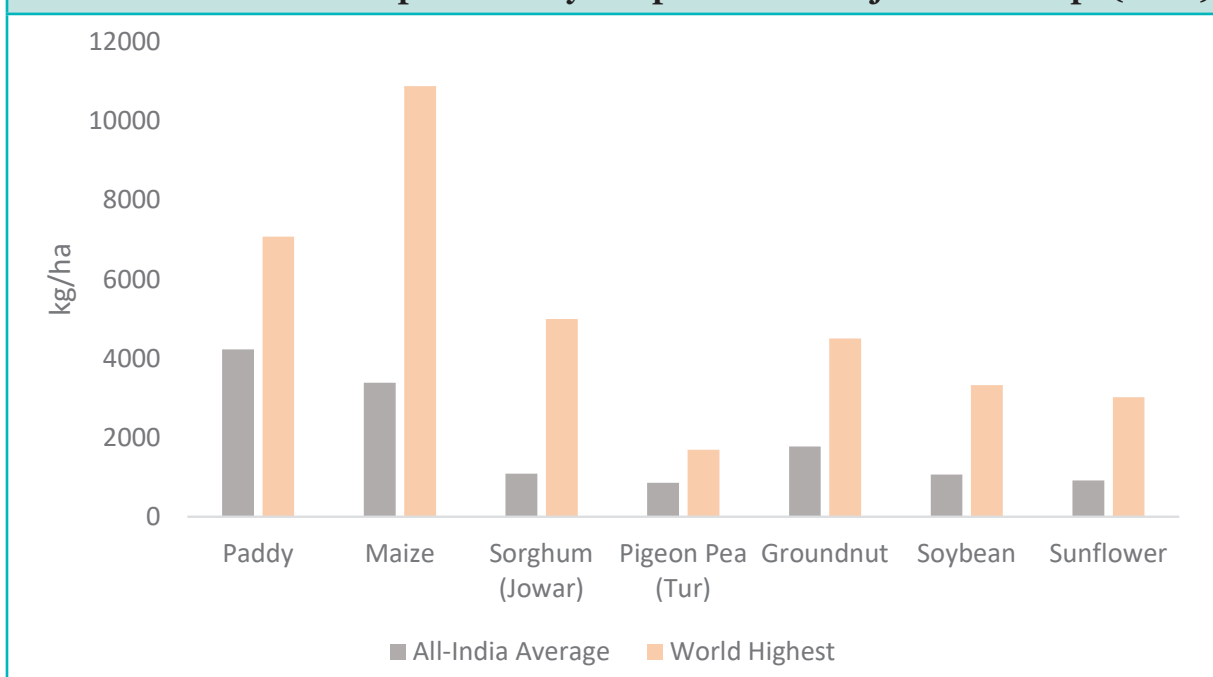
⁶ *ibid*

⁷ Understanding the Farm Acts, Working Paper 1/2020, Niti Ayog, November 2020

⁸ Department of Animal Husbandry and Dairying (Ministry of Fisheries and Animal Husbandry and Dairying)

⁹ National Statistical Office (NSO) M/o Statistics & Programme Implementation

¹⁰ <https://www.fao.org/india/fao-in-india/india-at-a-glance/en/>

Chart IX.2: International productivity comparison for major kharif crops (2022)

Source: Price Policy Report for Kharif Crops 2024-25

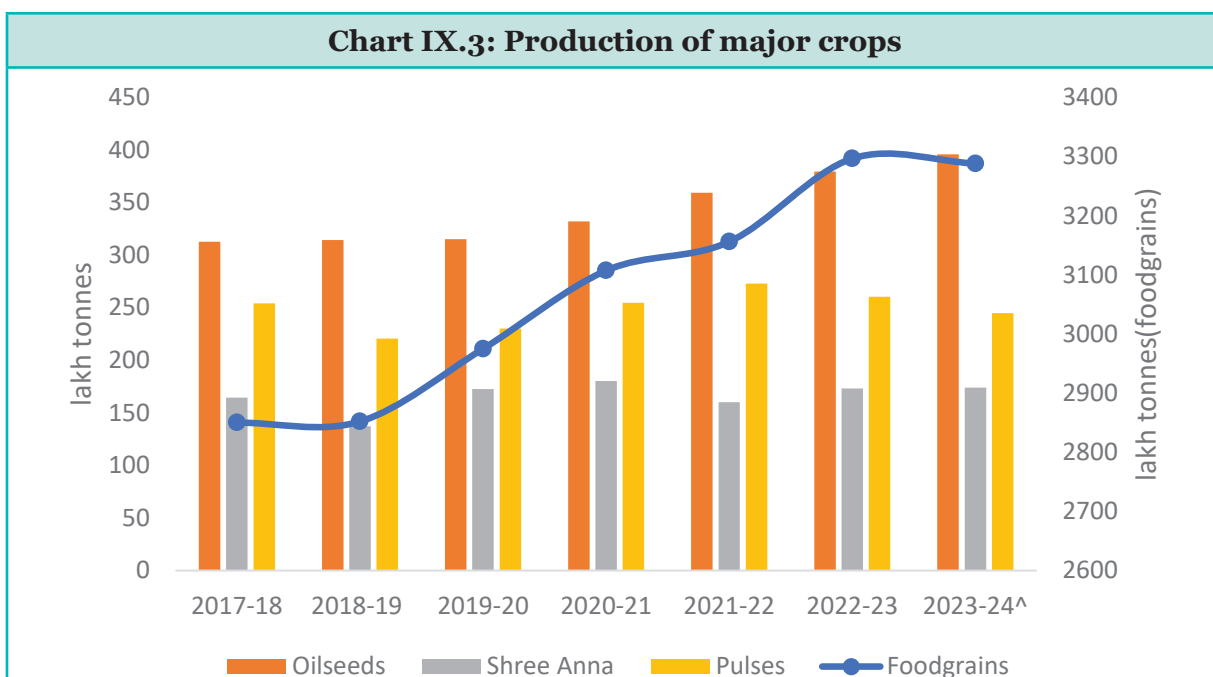
production was a step towards providing assured remunerative prices to farmers. Other interventions include income support through Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), which gives the farmer a direct financial benefit of ₹6000/- per year. Promotion of greater efficiency in the use of inputs and sustainable production methods through Per Drop More Crop (PDMC), a micro irrigation scheme and the actions under the National Mission on Sustainable Agriculture (NMSA), including the use of alternative and organic fertilisers are a few examples on other initiatives being undertaken to improve productivity and sustainability. In addition, digital initiatives such as the Digital Agriculture Mission and e-National Agriculture Market (e-NAM) have also been taken up to facilitate the adoption of smart agriculture technologies, with the latter allowing better price discovery.

9.4 The roles, animal husbandry and fisheries play in improving farmers' income, especially when agriculture holdings are reduced, is duly recognised. The scheme such as the Rashtriya Gokul Mission(RGM), National Digital Livestock Mission⁴ (NDLM), and National Programme for Dairy Development (NPDD) include interventions to improve quality, enable access to the organised markets and the development of indigenous breeds. The fisheries sector has been supported through programmes for improving productivity, access to institutional credit, and infrastructure development through the Fisheries Infrastructure Development Fund (FIDF) with a total fund size of ₹7.52 Thousand Crore. Similarly, Pradhan Mantri Matsya Sampada Yojana (PMMSY) introduced in May 2020 aimed at strengthening fisheries infrastructure, enable technology infusion and promote optimal water management. These interventions in fisheries sector have resulted in increasing fish production by an average annual growth of 7.4 per cent in 2022-23 from 2020-21¹¹.

¹¹ Department of Fisheries

AGRICULTURE PRODUCTION: PERFORMANCE AND PROMOTING CROP DIVERSIFICATION

9.5 In 2022-23, foodgrain production hit an all-time high of 329.7 million tonnes, and oilseeds production reached 41.4 million tonnes. In 2023-24, food grain production is slightly lower at 328.8 million tonnes¹², primarily because of poor and delayed monsoons. Production of other crops such as Shree Anna/nutri cereals and total oilseeds marked a slight increase. The nutri-cereals increased marginally by 1 per cent from the previous year, as did Tur, with a production estimated at 33.85 lakh tonnes (LT) as compared to last year's production of 33.12 LT. With the harvesting still in progress, there may be further changes in successive estimates. The production of lentil (Masur) is estimated at 17.54 LT, which is higher by 1.95 LT than the previous year's production of 15.59 LT.



[^]As per third advance estimates

Source: Ministry of Agriculture and Farmers Welfare

9.6 In recent years, the Government has promoted crop diversification to address sustainability challenges and shift production from water-intensive crops to others such as pulses, oilseeds, and Nutri-cereals/ Shree Anna. The government is implementing the Crop Diversification Programme (CDP) under the Rashtriya Krishi Vikas yojna (RKVY) to demonstrate and promote better production technologies of alternate crops for the diversion of paddy cultivation and to restore soil fertility through the cultivation of legumes. The National Food Security Mission (NFSM) is implemented across the country to enhance the production and productivity of foodgrain and commercial crops through the demonstration of crop production and protection technologies, access to high-yielding varieties, integrated nutrient and pest management techniques, efficient water saving devices, and capacity building of farmers etc. The government's push towards crop diversification is facilitated through a higher increase in

¹² Third Advance estimates, Ministry of Agriculture accessed at <https://desagri.gov.in/wpcontent/uploads/2024/06/English.pdf>

MSP over the average cost of production for oilseeds and pulses with lentils (masur), getting the highest among pulses at 89 per cent over the cost of production, followed by tur at 58 per cent in 2023-24 while MSP for coarse cereal/millets such as bajra was 82 per cent over the cost of production. The increase in MSP for safflower and soybean (yellow) was 52 per cent over the cost of production in 2023-24. This needs to be persisted with to address the imbalance between the production of rice and wheat and the production of pulses and oilseeds.

9.7 The Government has been implementing a National Food Security Mission- Oilseeds & Oil Palm (NFSM-OS&OP), from 2018-19 to augment the availability of vegetable oils through improved productivity and increase in acreage under cultivation. The total area coverage of all oilseeds has expanded significantly, increasing from 25.60 million hectares in 2014-15 to 30.08 million hectares in 2023-24 (17.5 per cent growth). The domestic availability of edible oil has risen from 86.30 lakh tonnes in 2015-16 to 121.33 lakh tonnes in 2023-24. This has reduced the percentage share of imported edible oil, from 63.2 per cent in 2015-16 to 57.3 per cent in 2022-23, despite rising domestic demand and consumption patterns. A remunerative minimum support price for rapeseed and mustard (which was at 98 per cent over cost in 2022-23) is also providing the incentive to farmers to diversify production¹³.

Promoting Investment and Access to credit in Agriculture and allied sectors

9.8 Gross capital formation (GCF) refers to the total investment in physical assets over a specific period. It includes new and existing fixed assets, such as machinery, buildings, land improvements, equipment purchases, and inventory changes¹⁴. This metric is a crucial indicator of investment in modernising agriculture, enhancing productivity, and ensuring sustainability. The development of infrastructure, particularly post-harvest facilities, can significantly reduce waste, preserve produce quality, and increase farmers' income. The GCF of the agriculture sector and the share of GCF in the agriculture and allied sectors as a percentage of Gross Value Added (GVA) has been growing steadily, mainly due to increased public investment. The GCF of the agriculture sector grew at the rate of 19.04 per cent in 2022-23, and the GCF as a percentage of GVA rose from 17.7 per cent in 2021-22 to 19.9 per cent in 2022-23, suggesting an increase in investment in agriculture¹⁵. The average annual growth in GCF from 2016-17 to 2022-23 was 9.70 per cent¹⁶.

9.9 However, despite the increasing trend in GCF, there is a need to further boost agriculture investment, especially in the context of doubling farmers' income. The DFI 2016 report indicated that to double farmers' income over the period of 2016-17 to 2022-23, income would need to grow at an annual rate of 10.4 per cent in the farm sector, which in turn would require an annual growth rate in agriculture investment of 12.5 per cent¹⁷. One significant challenge

13 Ministry of Agriculture

14 World Bank (<https://databank.worldbank.org/metadataglossary/world-development-indicators/series/NE.GDI.TOTL.ZS>)

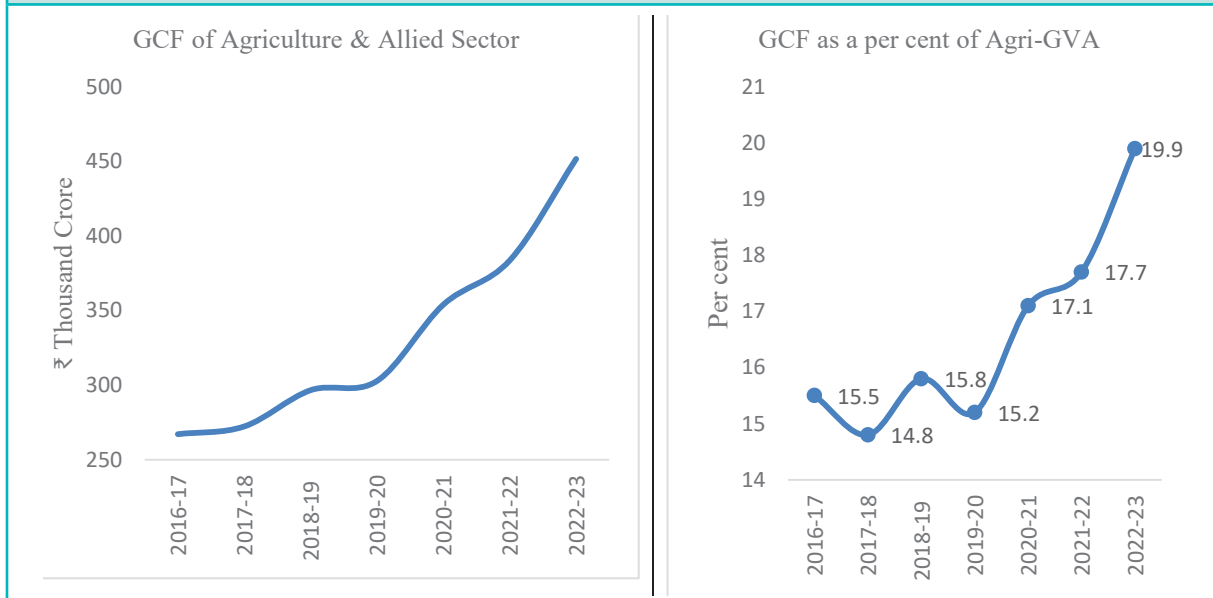
15 Investments in agriculture mainly refers to land, input and production related investments. It does not include investments in markets, storage, transport, grading and other post-harvest infrastructure.

16 Survey calculations based on data from NSO

17 Volume XIV of Doubling Farmers income Report 2018 (<https://foodprocessingindia.gov.in/uploads/publication/MoFPI1609496430agriculture2.pdf>)

in this area is the fragmentation of agricultural land, which has adversely affected farmers' investments. On the other hand, the private corporate sector's share has remained below 2 per cent.¹⁸

Chart IX.4: GCF of agriculture & allied sector and GCF as a per cent of Agri GVA



Source: Second Advance Estimates of National Income, National Statistical Office (PIB Press release (various issues Office

9.10 Subsidies have also played a significant role in influencing farmer behaviour towards adopting better quality seeds, encouraging the use of appropriate composition and quantity of fertiliser, and improving access to farm machines from custom hiring centres. Subsidies to the agriculture sector more than doubled between 2011-12 and 2020-21, with the fastest increase seen in fertiliser and power. As a result, while public investments grew at the same rate as the subsidies, they remained at about one-third of the subsidies¹⁹.

9.11 Input subsidies support short-term increases in agricultural productivity and farmer incomes.²⁰ Higher investment levels, on the other hand, are required for the long-term modernisation of this sector, for which active participation from private corporate entities is needed, especially in post-harvest infrastructure.

9.12 Recognising the need to crowd in private investments, the government, since 2014, has been implementing the Agriculture Marketing Infrastructure (AMI) sub-scheme of the Integrated Scheme for Agricultural Marketing (ISAM), under which capital subsidy is provided, with the objective to improving the extent of storage infrastructure. It is a demand-driven, credit-linked scheme offering subsidies of 25 per cent (for the plains) and 33.33 per cent (for North-East and

18 Chand, R., & Singh, J. (2023). From Green revolution to Amrit Kaal. National Institution for Transforming India. GoI.

19 Chand, R., & Singh, J. (2023). From Green revolution to Amrit Kaal. National Institution for Transforming India. GoI.

20 Chand, R. (2017). Presidential Address: Doubling farmers' income: Strategy and prospects. Indian Journal of Agricultural Economics, 71(1), 1-23 and Chand, R. (2022). Agricultural challenges and policies for the 21st century. NABARD Research and Policy Series, (2), 36.

hilly regions) to individuals, farmers, FPOs, cooperatives, and state agencies. As of 30th April 2024, 48357 projects were sanctioned for storage infrastructure with ₹4570 Crore released as subsidy, and 20878 other projects²¹ are also under progress with ₹2084 Crore released as subsidy. To give further fillip to farm gate infrastructure and also involve the private sector more actively, the Agriculture Infrastructure Fund (AIF) was launched with a financing facility of ₹1 lakh Crore to be disbursed between FY 2020-21 to FY 2025-26 with support extending till FY 2032-33. The AIF provides medium-term debt financing for post-harvest management and community farming projects, offering interest subvention and credit guarantee support. As of 5th July 2024, AIF mobilised an investment of ₹73194 Crore, supporting 17196 custom hiring centres, 14868 primary processing units, 13165 warehouses, 2942 sorting and grading units, 1792 cold storage projects, and 18981 other projects. In addition, the Pradhan Mantri Kisan SAMPADA Yojana (PMKSY) introduced credit-linked financial assistance through grants-in-aid to build efficient supply chain management from farm to retail to reduce the wastage of perishable produce and extend food shelf life. Under PMKSY 1044 projects were completed till end March 2024. A total of 1685 projects with project cost ₹ 32.78 Thousand Crore and approved subsidy of ₹ 9.3 Thousand Crore have been approved till end March 2024.

Empowering farmers through affordable and enhanced access to credit

9.13 Indian agriculture continues to be dominated by small landholders. About 89.4 per cent of farm households own less than 2 hectares of land.²² The ability of the farmers to invest in their farmlands directly depends on access to affordable credit. The government's priority has been to provide timely, cost-effective, and adequate credit that reduces the dependence on non-institutional credit and increases investment. The measures have reduced the share of non-institutional credit from 90 per cent in 1950 to 23.40 per cent in 2021-22²³. As of 31 January 2024, the total credit disbursed to agriculture amounted to ₹ 22.84 lakh Crore, with ₹13.67 lakh Crore allocated to crop loans (short term) and ₹ 9.17 lakh Crore to term loans²⁴.

9.14 The Kisan Credit Card (KCC) has streamlined agricultural credit accessibility. As of January 31, 2024, banks issued 7.5 crores KCC with a limit of ₹9.4 lakh crores. As a further measure, the KCC was extended to meet the working capital needs of fisheries and animal husbandry activities in 2018-19, along with the enhancement of the limit for collateral-free loans to ₹1.6 lakh. In the case of a Tri-Partite Agreement (TPA) among borrowers, milk unions, & banks, the collateral-free loan can go up to ₹3 lakh.²⁵ As of March 31, 2024, 3.49 lakh KCC and 34.5 lakh KCC were issued to fisheries and animal husbandry activities, respectively. In addition, Joint Liability Groups (JLGs)²⁶ have emerged as an essential source of credit for tenant farmers. JLG accounts have grown at a compound annual growth rate (CAGR) of 43.76 per cent over the past five years, emerging as a vital source in meeting the credit needs of tenant farmers and marginalised segments.

21 Other projects refer to storage infrastructure that is cleaning, grading, sorting, packing, etc.

22 Situation Assessment Survey, NSO, NSS 77th round

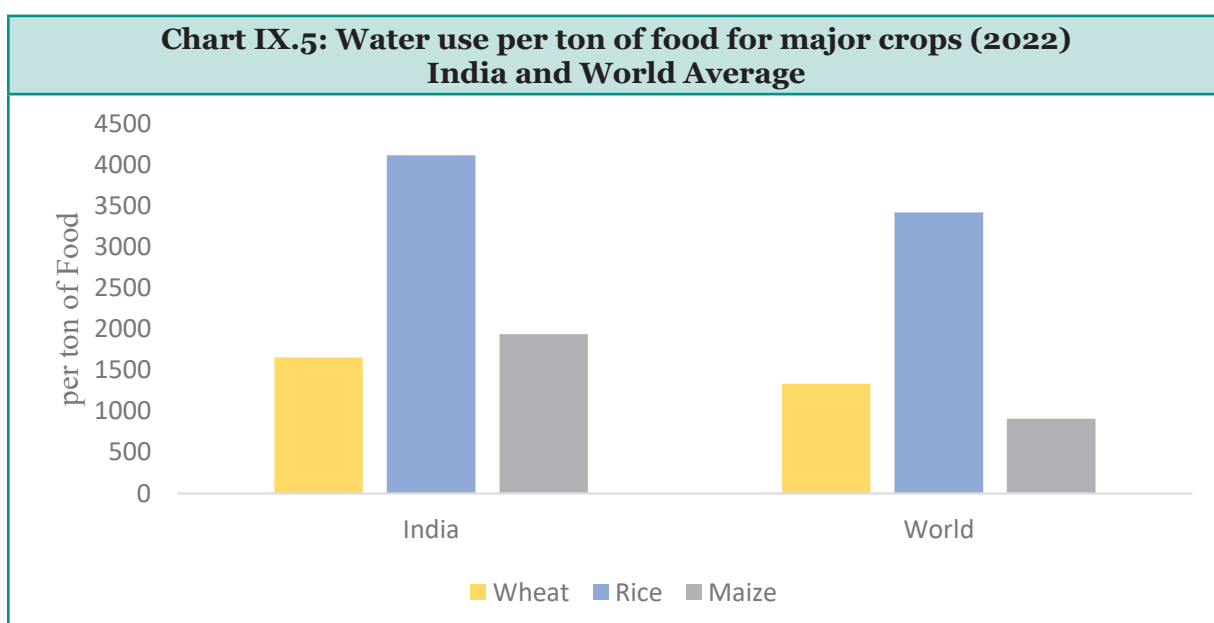
23 NABARD National Financial Inclusion Survey 2.0

24 <https://www.rbi.org.in/scripts/PublicationReportDetails.aspx?UrlPage=&ID=942>

25 <https://financialservices.gov.in/beta/en/agriculture-credit>

26 Joint Liability Groups (JLGs) serve as informal associations comprising four to ten individuals united by the common goal of accessing bank loans through collective or individual endeavours under a shared guarantee.

9.15 Insurance schemes such as the Pradhan Mantri Fasal Bima Yojana (PMFBY) offer a safety net against crop losses due to natural calamities, pests, or diseases, ensuring financial stability for farmers. These schemes safeguard farmers' livelihoods and encourage them to adopt modern farming practices and technologies. PMFBY is the largest crop insurance scheme in the world in terms of farmer enrolment and is the third largest scheme in terms of insurance premiums. The scheme provides a simple and affordable crop insurance product to ensure comprehensive risk cover for crops to farmers against all non-preventable natural risks from pre-sowing to post-harvest. The overall insured area in 2023-24 reached 610 lakh ha compared to 500.2 lakh ha in 2022-23. A total of 5549.40 Lakh farmer applications were insured under the scheme since 2016-17, and ₹150589.10 Crore has been paid as claims. High premium costs compared to insurance claims, delays in settling claims, lack of transparency, and uniform premium rates that do not account for different conditions across states have impacted the performance of the scheme.²⁷ Another study also indicates that cumbersome procedure of paying premiums, lack of bank facilities near the village and poor awareness of the scheme among small and marginal farmers have limited the impact of the scheme.²⁸



Source: FAOSTAT, WDI, UNESCO (for water)

27 Report on Crop feasibility study to recommend appropriate mechanisms for providing farmers with rational compensation on occurrence of crop losses and identifying vulnerable districts for risk coverage under Pradhan Mantri Fasal Bima Yojana (PMFBY) Department of Agriculture & Farmers Welfare, Ministry of Agriculture & Farmers Welfare. (2022).

28 A study on Evaluation of Mega Awareness Campaign of Pradhan Mantri Fasal Bima Yojana, (National Institute of Agriculture Extension Management (2023)

Box-IX.1: Recent technology interventions in PMFBY

- **Digi-Claim-Payment Module** – A new module has been launched to integrate the National Crop Insurance Programme (NCIP) with public financial management system (PFMS) end-to-end. Now, the government will have visibility of the quantum of eligible claims, claims paid by the Insurance Company and actual claims transferred to beneficiary farmers.
- **Yield Estimation Based on Technology (YES-Tech)** is a technology-based yield estimation mechanism developed after two years of rigorous testing and a pilot that runs across 100 country districts. Nine states, namely, Assam, Haryana, Rajasthan, Madhya Pradesh, Maharashtra, Andhra Pradesh, Tamil Nadu & Karnataka & Odisha, are implementing Yes-Tech from the Kharif 2023 season onwards.
- **Weather Information Network & Data System (WINDS)**- is a pioneering initiative to set up a network of Automatic Weather Stations & Rain Gauges at Taluk/Block and Gram Panchayat (GP) levels for use of all farmer and farming-oriented services. It is proposed that an automatic rain gauge (ARG) would be installed at every GP and an automatic weather station (AWS) at every block covered under PMFBY.
- **Collection of Real-time Observations and Photographs of Crops (CROPIC)**- is an initiative that has been taken up to collect periodic photographs of crops during their life cycle. These photographs will validate sown and insured crops, assess crop damage when any localised and widespread calamity or climatic condition affects the crops, and act as an input for Technology-based yield estimation models.

Agriculture Marketing-Reaping prosperity

9.16 A comprehensive and diversified marketing network enables the farmer to bring the produce to the market most efficiently and timely. It reduces post-harvest losses, enhances competition, and allows price discovery. With the increase in marketable surplus, it has become all the more essential to provide the farming community with better marketing facilities. Delays in farmers accessing formal institutions, including for government procurement at the Agricultural Price Marketing Committee (APMC), enhance reliance on intermediaries²⁹.

9.17 The average area served by mandis in the country is 434.48 sq. km against the recommendation of the National Commission on Farmers (2006) of the market within a radius of 5 Km (corresponding market area of about 80 sq. km.). The physical constraints in transporting produce to mandis present another layer of difficulty, particularly for small and marginal farmers who may have to travel long distances³⁰.

9.18 To Promote efficiency in agriculture marketing, and improve price discovery, the government implemented the e-NAM Scheme. Under the e-NAM Scheme, the Government

29 The Standing Committee on Agriculture (2018-19): Agriculture Marketing and role of Weekly Gramin Haats, Sixty Second Report

30 Final Report of Committee of State Ministers, In-charge of Agriculture Marketing to Promote Reforms(2013)

provides free software and assistance of ₹75 Lakh per APMC mandi for related hardware, including quality assaying equipment and the creation of infrastructure for cleaning, grading, sorting, packaging, etc. As of 14th March 2024, more than 1.77 Crore farmers and 2.56 Lakh traders have been registered on the e-NAM portal. The Government of India launched the scheme to form and promote 10,000 FPOs in 2020 with a budget outlay of ₹6.86 Thousand Crore till 2027-28. As of 29 February 2024, 8,195 FPOs have registered under the new FPO scheme, and equity grants of ₹157.4 Crore were released to 3,325 FPOs. Credit guarantee cover worth ₹278.2 Crore was issued to 1,185 FPOs.

9.19 Studies have evaluated the performance and prospects of the e-NAM³¹ and concluded that the initiative has generally had a positive impact on farmers by enabling higher price realisation for their crops, thus fulfilling one of its primary objectives. Farmers who participated in e-NAM reported receiving higher prices for their crops post-implementation. About 66 per cent of farmers from the surveyed states found the quality testing procedures transparent³². A significant proportion of farmers (82 per cent, 79 per cent, 64 per cent, and 89 per cent) in states like Gujarat, Haryana, Maharashtra, and Telangana, respectively, observed better pricing and reduced transaction costs. Overall, farmers expressed satisfaction with the e-NAM facilities, including cleaning, drying, weighing, assaying, bid management, and e-auction. Similarly, it is seen that 54 per cent of the farmers prefer transactions through the eNAM portal over traditional markets due to the multiple benefits derived through this portal³³. Implementation challenges of e-NAM still exist, such as limited awareness, lack of trust and infrastructure issues related to setting up assaying facilities.

Box IX. 2: Futures market for agriculture commodities in India

The establishment of a forward market in commodities was driven by the recognition that while the production of agricultural products was largely seasonal and subject to various risks, consumption was not. The forward market serves as a mechanism that brings the prospects of future production and consumption to influence today's price in a logical manner. This process, among other things, establishes a link between present and future production and consumption cycles, thereby facilitating the inter-temporal smoothing of prices. This understanding of the forward market is crucial in comprehending the evolution and current state of the Indian agricultural commodity markets (Bhattacharya, 2007).

- 31 Nuthalapati, C. S. R. (2020). Institute of Economic Growth. Link to access. <https://desagri.gov.in/wp-content/uploads/2024/04/2020-21-Electronic-National-Agricultural-Market-e-NAM-A-Review-of-Performance-and-Prospect.pdf>
- Shah, B et,al(2023). Electronic National Agriculture Market (e-NAM): A Review of the game changing Marketing Platform. Link to access https://www.researchgate.net/publication/374975907_Electronic_National_Agriculture_Market_e-NAM_A_Review_of_the_game_changing_Marketing_Platform
- Performance Evaluation of e-National Agriculture Market (2020) CCS National Institute of Agricultural Marketing: Link to access:<https://ccsniam.gov.in/images/pdfs/Evaluation.pdf>
- 32 Nuthalapati, C. S. R. (2020). Institute of Economic Growth. Link to access.<https://desagri.gov.in/wp-content/uploads/2024/04/2020-21-Electronic-National-Agricultural-Market-e-NAM-A-Review-of-Performance-and-Prospect.pdf>
- 33 <https://ccsniam.gov.in/images/pdfs/Evaluation.pdf>

Evolution: The Indian commodity derivatives market has a long history. India had around 300 commodity exchanges during the 1940s. Until 1952, trading in these exchanges was not regulated by a standard policy or a market regulator. After independence, the GoI formulated the Forward Contracts (Regulation) Act of 1952 and set up the Forward Market Commission (FMC) in 1953 as the regulator. In 1966, a comprehensive ban on futures trading was imposed to control price volatility. At different times, the GoI appointed different committees to look into the feasibility of reintroducing commodity derivatives trading.

Agriculture futures trade in India got a major revival in 2003 with the setting up of national exchanges such as the National Commodity and Derivative Exchange (NCDEX), Multi Commodity Exchange (MCX), and National Multi Commodity Exchange (NMCE). A significant development in the Indian commodity regulatory landscape happened in 2015 when the GoI repealed the Forward Contracts Regulation Act 1952 (FCRA), and Commodity derivatives markets were brought under the Securities Contracts (Regulations) Act (SCRA), 1956 with the Securities and Exchange Board of India (SEBI) taking over from the Forward Market Commission as the commodity market regulator in September 2015. In parallel, e-NAM were introduced by the GoI in 2016 to provide farmers with an electronic online marketplace for agricultural produce. Electronic spot markets for commodities are crucial in integrating localised physical markets, establishing a direct link between the buyer and seller and providing a transparent price discovery mechanism.

Current state of play: The commodity futures market can effectively contribute to price discovery only when many consumers, producers, traders, and aggregators use these markets to hedge their risk. The interplay of these participants, speculators, and arbitrageurs provides liquidity and helps price discovery for longer periods. However, given that most Indian farmers are marginal with fragmented land holdings, they are often left without the necessary wherewithal to engage/participate in these markets effectively, leading to reduced depth in the Indian commodity futures market. Further, it is also observed that the requirement of standardised exchange contracts with specified quality parameters and delivery requirements has also impeded the majority of Indian farmers from effectively engaging in the commodity futures market since the Indian farmers produce different varieties of commodities in widely varying qualities due to varied geographical, weather, and soil conditions. Additionally, periodic bans imposed by GoI on futures trading on agri-commodities as one of the measures to counter food inflation have also had implications on the traded value and price volume in Indian commodity and derivative exchanges.

The way forward: Studies point out that the Indian commodity market can be strengthened through a sequenced diversification of agri-future portfolio. As is highlighted in the 2008 Abhijit Sen Committee Report, “combining prudence with the benefit of the doubt, the best course of action would be to identify those commodities where there is the possibility of futures trading affecting expectations that may influence inflation in essential commodities and insulate these from futures.” Sensitive commodities (e.g., common rice, wheat, most pulses, etc.) may be kept outside the ambit of the futures market until the markets are developed and the regulator has a higher degree of comfort in diversifying the portfolio. The agriculture futures market may focus on less sensitive commodities like oilseed complex (oilseeds, meals, and oils), feed (maize), cotton, basmati rice, spices, etc.

As part of recent policy initiatives to broaden the commodity derivatives market, the

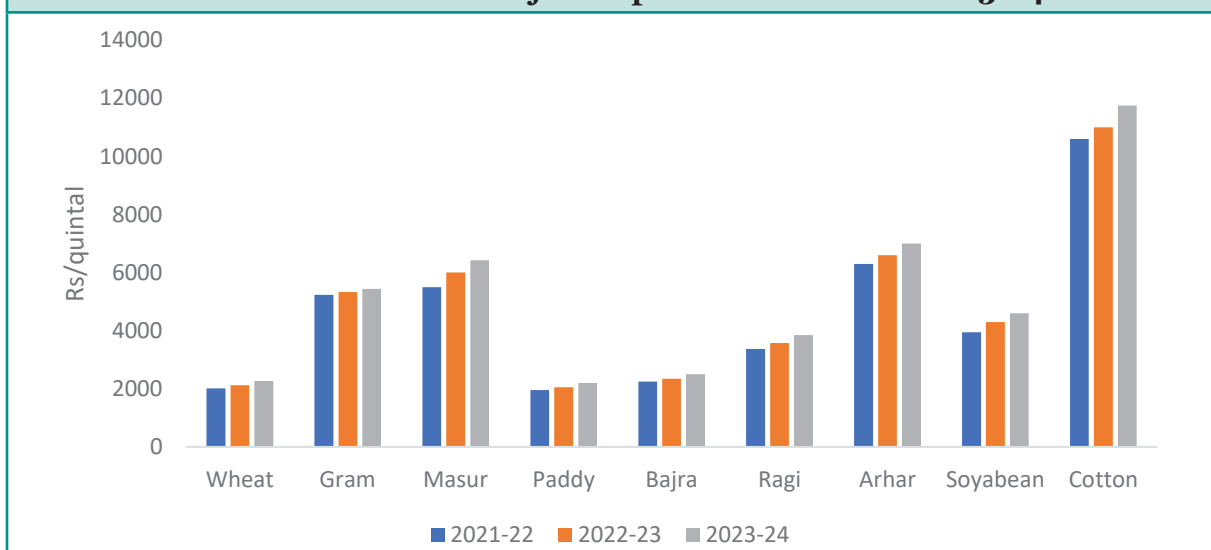
Government of India, on March 1, 2024, expanded the list of commodities eligible for derivatives trading from 91 to 104. The new commodities added to the list include Apples, Cashews, Garlic, Skimmed Milk Powder, White butter, Weather, Processed timber products, Processed bamboo products, etc.

Once the regulators provide clear direction regarding the choice of commodities, they must stay the course by adopting a stable policy with minimal interventions. Farmer Producer Organisations can play a significant role in effectively linking small and dispersed farmers in India and the Commodity markets eco-system. The role of Government, SEBI, and Commodity Exchanges in promoting FPOs in various segments of agri-commodities across the country is pivotal. Skilling and hand-holding the FPOs through financial literacy initiatives can go a long way in encouraging the farmers to benefit from the Agri-derivative markets. As the depth and liquidity in the agri-derivative market increases in the long -run, banning futures trading may no longer be required to stabilise prices unless there is data-backed evidence of futures trading driving up price volatility. The regulator should closely watch the futures market and undertake regular reviews given the fluctuations in domestic production, consumption, and global trade.

Assured Remunerative Prices and Other Income Support Measures

9.20 Agricultural price support assures farmers of remunerative returns and allows the Government to ensure a stable supply of staples at reasonable prices. Minimum Support Price is a factor farmers take into account when making sowing decisions. In India, the government has implemented price policies to encourage the production of food grains, pulses, oilseeds, and nutri-cereals. These policies are designed to provide a safety net to farmers by guaranteeing a minimum price for their produce, thus protecting them from the volatility of market prices. The Union Budget for 2018-19 announced that farmers in India would be given an MSP of at least one and a half times the cost of production. Accordingly, the Government has been increasing the MSP for all 22 Kharif, Rabi and other commercial crops with a margin of at least 50 per cent over the all-India weighted average cost of production since the agricultural year 2018-19.

Chart IX.6: MSP of major crops from 2021-22 to 2023-24



Source: Commission for Agricultural Costs & Prices (CACP)

9.21 Another initiative towards increasing farmers' income is PM-KISAN - a central sector scheme launched on 24 February 2019 to supplement the financial needs of land-holding farmers, subject to exclusions. Under the scheme, an economic benefit of ₹6000/- per year is transferred in three equal four-monthly instalments into the bank accounts of farmers' families across the country through Direct Benefit Transfer (DBT) mode. More than ₹3.24 lakh Crore has been released to more than 11 crore farmers as of 10 July 2024.

9.22 To provide social security to the most vulnerable farmer families, the Government implements Pradhan Mantri Kisan Maandhan Yojna (PMKMY). The scheme offers a monthly pension of ₹3,000 to the enrolled farmers on the attainment of 60 years of age, based on a nominal premium between ₹55 to ₹200 per month paid by the applicant (in the age group 18 to 40 years) subject to exclusion criteria. As per the Ministry of Agriculture, as of 07 July 2024, 23.41 lakh farmers have enrolled under the scheme.

Farm Mechanisation- Powering agriculture

9.23 Agricultural mechanisation covering simple hand tools to more complex machinery has become essential to modern agriculture and contributes towards productivity. Considering that most farmers in India are small and marginal, providing machinery through custom hiring can enhance the adoption of farm mechanisation among these farmers and in regions where mechanisation levels are currently low. The Sub Mission on Agricultural Mechanization (SMAM) provides assistance to the State Government for training and demonstration of agricultural machinery, setting up of Custom Hiring Centres (CHC) and assists farmers in procuring various farm machinery and equipment. The total funds allocated under SMAM from 2014-15 to 2023-24 was ₹7.26 Thousand Crore. In 2023-24, the allocation was ₹859.45 Crore. Further, Farm Machinery Banks promote access to high-tech machinery for small and marginal farm holdings and farm holdings under challenging areas with low levels of mechanisation. During the period 2014-15 to 2023-24, 25527 CHC were established under the scheme, and 607 CHC were set up in 2023-24.

Making Agriculture Sustainable

9.24 A growing challenge in agriculture pertains to sustainability issues like overexploitation, degradation of natural resources, and addressing the impact of climate change. The agricultural methods and inputs used have also had significant implications for sustainable agriculture. For example, increased use of fertiliser and chemicals, overexploitation, and unsustainable use of water resources have affected soil health and fertility. Variability in weather conditions and the relative predominance of rainfed agriculture also impact production and productivity. Sustainability in agriculture is highly relevant to securing the long-term productivity of land holdings, ensuring sufficient farm-based incomes and food security. With 11 of the 17 Sustainable Development Goals (SDGs) directly linked to agriculture, securing improvements in crop yields and ensuring income stability is vital for the country as it strives to achieve the Agenda 2030 goals.

9.25 The climate change impact assessment carried out by the government underscores the need for adaptation in the sector. In the absence of the adoption of adaptation measures, rainfed rice yields in India are projected to drop by 20 per cent in 2050 and 47 per cent in 2080 scenarios, while irrigated rice yields are projected to reduce by 3.5 per cent in 2050 and 5 per

cent in 2080 scenarios. Climate change is projected to reduce wheat yield by 19.3 per cent in 2050 and 40 per cent in 2080 scenarios³⁴.

9.26 National Mission for Sustainable Agriculture, a part of the National Action Plan on Climate Change (NAPCC), aims to evolve and implement strategies to make Indian agriculture more resilient to the changing climate. One of the most critical interventions in the face of changing climate is to ensure that farmland gets assured irrigation. In this context, Rainfed Area Development (RAD), implemented under the NMSA to enhance productivity and minimise risks associated with climatic variability, is germane. An amount of ₹1.74 Thousand Crore has been released & an area of 7.33 Lakh hectares has been covered under the RAD programme. Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), consisting of two major components, the Accelerated Irrigation Benefit Programme (AIBP) and Har Khet Ko Pani (HKKP), promote the extension of areas under irrigation and water efficiency. Irrigation area coverage increased from 49.3 per cent of gross cropped area (GCA) in 2015-16 to 55 in 2020-21. Similarly, irrigation intensity (ratio of gross irrigated area to net irrigated area) recorded a rise of 10.3 percentage points, from 144.2 per cent in 2015-16 to around 154.5 per cent in 2021-22, while cropping intensity increased by 12.8 percentage points during this period³⁵. A Micro Irrigation Fund (MIF) of an initial corpus ₹5 thousand Crore has also been created with NABARD to facilitate the States in mobilising the resources for expanding coverage of micro irrigation. Further, PDMC scheme also supports micro-level water harvesting, storage, management, etc. An area of 90.0 Lakh hectares has been covered under micro irrigation in the country under the PDMC from 2015-16 to 2023-24 as of 6th February 2024³⁶.

Box-IX.3: Policy led interventions to improve water management-National and International Experience³⁷

Automation of Irrigation System: Narayanpur Left Bank Canal System (Karnataka)

The Narayanpur Left Bank Canal (NLBC) system in Karnataka was facing significant challenges such as inadequate water regulation, manual control of gates, and inequitable water distribution. To address these issues, the government implemented an automation system that included over 4,000 automated control and regulating gates, solar-powered integrated gates, and a master VSAT communication system. These interventions have optimised water use efficiency, improved equitable distribution, and enhanced overall agricultural productivity in the region.

Diversion-Based Irrigation System

In the hilly and undulating regions of Barwani and Khargone districts in Madhya Pradesh, the Aga Khan Rural Support Programme (AKRSP) has initiated the development of diversion-

34 <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1909206>

35 CACP report on Kharif Price Policy 2024-25

36 *ibid*

37 Compendium of Best Practices in Water Management NITI Aayog(2023): Link to access; https://www.niti.gov.in/sites/default/files/2023-08/COMPENDIUM-OF-BEST-PRACTICES-IN-WATER-MANAGEMENT-3.0-Water-Resources-Vertical_2_8_23.pdf

based irrigation (DBI) systems. These systems use gravity flow to divert water from streams to agricultural fields. Since 2016, 13 DBI systems have been operationalised, bringing 111 hectares of land under irrigation and benefiting 93 farmers. The cost-effective nature of these systems, requiring approximately ₹300 per running meter, makes them a viable solution for enhancing irrigation coverage in hilly terrains.

Growing Tomatoes Without Soil Using Vertical Farming in Hydroponics

Vertical farming with hydroponics allows the cultivation of tomatoes without soil, offering numerous benefits such as space efficiency, reduced water usage, and year-round production. This method has been implemented in Port Augusta Farm, South Australia, which features a 4.5-hectare greenhouse powered by a 51,500 m² concentrated solar power plant. This plant includes 23,000 mirrors that direct sunlight to a 127-meter-high tower weighing 234 tons. The generated heat serves three purposes: maintaining optimal temperatures in 20 hectares of greenhouses, generating electricity via a turbine to power farm systems, and desalinating seawater drawn from the nearby Spencer Gulf. The farm produces one million liters of fresh water daily by desalinating seawater from 3 kilometers away. It grows 7,000 tonnes of tomatoes annually, which accounts for 15 per cent of Australia's total crop, on arid land. In addition, 180,000 tomatoes are grown hydroponically in stacks without soil, saving 2 million liters of diesel and reducing CO₂ emissions by 15,000 tons compared to traditional farming methods.

This method entails growing plants in nutrient-rich water solutions customized to their specific requirements. Vertical hydroponic systems can be employed in urban areas, reducing the environmental impact of transportation and offering locally sourced fresh produce.

Temporary Flood Water Storage in Agricultural Areas in the Middle Tisza River Basin

In the Middle Tisza River Basin, temporary floodwater storage in agricultural areas is being used to reduce flood risks and provide extra irrigation. By storing excess floodwater in specific agricultural fields, the region can better control water levels, decreasing the risk of flooding downstream. This method not only safeguards infrastructure but also improves soil fertility by depositing nutrients from the floodwaters, leading to increased agricultural productivity.

These interventions demonstrate innovative water management and agricultural productivity approaches, addressing specific regional challenges with tailored solutions.

9.27 Another area of intervention is focused on reducing the use of chemical fertilisers in Indian agriculture. Even while the per-hectare usage of agricultural chemicals in India remains significantly lower than in most developed countries, its use of chemical fertilisers has increased over the years³⁸. In fact, here it may be noted that the current subsidy structure has contributed to an increased application of urea, which has impacted the nutrient imbalance in the use of major plant nutrients, nitrogen-phosphorus-potassium (NPK), affecting the efficiency of fertiliser use, the quality of soil and output³⁹ and environment. Revising subsidy policies to support all

38 Chand, R., & Singh, J. (2023). From Green revolution to Amrit Kaal. National Institution for Transforming India. GoI.

39 <https://www.epw.in/journal/2023/52/letters/nutrient-imbalance-india.html>

major nutrients (N, P, K) can incentivise farmers to use a more balanced approach. While the composition is important, so is the quantity of application. With the view to building knowledge and capacity among farmers, demonstrations to administer precise fertiliser application were carried out with more than 1.79 Lakh drones across several states.

9.28 The PM Programme for Restoration, Awareness Generation, Nourishment, and Amelioration of Mother Earth (PM-PRANAM) initiative incentivises states to reduce chemical fertiliser use. It promotes sustainable methods such as the use of alternative fertilisers, viz. Nano Urea, Nano DAP, and organic fertiliser. Under the said scheme, 50 per cent of the fertiliser subsidy saved by a State/UT in a particular financial year by way of a reduction in consumption of chemical fertilisers (Urea, DAP, NPK, MOP) compared to the previous three years' average consumption, will be passed on to that State/UT as a grant. In addition to these initiatives, the Soil Health Card Scheme was introduced to optimise the usage of nutrients. The introduction of "Urea Gold", which is urea infused with sulphur to address sulphur deficiencies, has been another measure to improve the nutrient balance in the soil.

9.29 Organic and natural farming provides chemical-free fertiliser and pesticide-free food grains and other crops, improving soil health and reducing environmental pollution. About 68.05 Lakh ha was brought under organic farming by 2022-23. Sikkim became the first state in the world to become fully organic, and other states, including Tripura and Uttarakhand, have set similar targets. The Government has also been promoting organic farming by implementing two dedicated schemes, i.e., Paramparagat Krishi Vikas Yojana (PKVY) and Mission Organic Value Chain Development for North Eastern Region (MOVCDNER) since 2015 through cluster/FPO formation. PKVY Scheme is being implemented in a cluster mode (with a minimum of 20 ha size). Financial assistance of ₹31,500 per ha for three years, out of which ₹15,000 is given as an incentive for organic inputs provided directly through DBT. Under PKVY, as of 2022-23, 48,144 clusters totalling 13.98 Lakh ha area and 24.22 Lakh farmers have been covered.

Box-IX.4: Flexible, farmer-friendly and ecologically sustainable fertiliser subsidy: A suggested way forward

The Lok Sabha Standing Committee on Chemicals & Fertilisers, in their Thirty-Ninth Report, titled 'Nano-Fertilisers for sustainable crop production and maintaining soil health', presented on March 29, 2023, underscored the urgency of the following issue: Fertiliser consumption in India is imbalanced, and Urea accounts for more than 82 per cent of the nitrogenous fertilisers applied to the majority of the crops. As a result, the Nitrogen, Phosphorus and Potassium (NPK) consumption ratio has widened from 4:3.2:1 in 2009-10 to 7:2.8:1 in 2019-20. This imbalance, leading to the deterioration in soil quality and health hazards, necessitates an immediate re-examination of urea subsidy management in agriculture while also considering the sustainability aspects in the long run.

The current design of fertiliser subsidy in India: Based on the recommended dose of nutrients (RDN) calculated by each state⁴⁰, the Government of India calculates the recommended dose of fertiliser (RDF) and allocates fertilisers to States for each season.

The States, in turn, sell the fertiliser to the farmers through dealers and primary agriculture

40 The RDN is calculated by each state based on crops grown and soil nutrient status.

cooperative societies using POS devices. Based on the quantity of fertilisers sold to farmers, the Department of Fertilisers pays fertiliser subsidies to the fertiliser companies. However, there are some critical issues with the current design. This includes the following:

- PoS devices at fertiliser outlets are not integrated with land record data
- Any person having an Aadhaar, whether a farmer or not, can buy any quantity of fertilisers
- No limit on the sale of fertiliser to one person or one family
- Adverse financial and ecological impacts such as diversion of subsidised fertiliser for non-agriculture purposes; overuse of fertilisers which adversely affect the soil health; shortage of fertiliser; waste of public resources and health hazards.

Using Agri Stack to improve the targeting of fertiliser subsidy: Agri Stack is the digital foundation set up by the government to make it easier to bring various stakeholders together to improve agriculture in India and enable better outcomes and results for the farmers by using data and digital services. It is now fairly well developed in the major Indian States and can provide the right tool through which the fertiliser subsidy may be better targeted. This will ensure that subsidised fertilisers are sold to only those identified as farmers or authorised by the farmer, and the quantity of subsidised fertiliser is fixed based on parameters such as land ownership and prominent crops of the district (comprising at least 70 per cent of sown area in a season). The parameters may be later refined based on crop grown and soil nutrient status (in convergence with the Soil Health card scheme and provisions may be made to provide top-up entitlement in case of crop damage or calamities caused by volatilities in weather conditions, in convergence with State diaster response fund (SDRF) / National diaster response fund (NDRF).

E-RUPI, a seamless one-time payment mechanism, can be utilised to provide the necessary subsidy to the farmer directly. This system ensures that the Subsidy can only be used through registered PoS devices at authorised fertiliser outlets. Suppose a farmer purchases a quantity of fertilisers that is less than their entitlement. In that case, the remaining subsidy can be used to purchase other agricultural inputs, such as seeds and pesticides, also sold at these outlets. Any unused subsidy at the end of the year can also be converted into a small savings instrument in the farmer's name at a post office. This system not only streamlines the subsidy distribution process but also prevents the misuse of subsidies for non-agricultural purposes. This will give an incentive to the farmer not to use excessive Urea on account of being cheaper than the other NPK fertiliser and may lead to balanced use of fertilisers as per the requirement of the crop & soil.

Some fundamental aspects that would be required to ensure the efficiency of the new mechanism will be as follows:

- Integration of PoS devices with farmer's registry in Agri Stack and the farmer's registry will include the Aadhaar number of each farmer, details of all agricultural lands owned by the farmer as per Record of Rights (RoR), and dynamic updation of land ownership data through mutation module
- Facility to include name, Aadhaar number and other details of family members and any other person authorised to buy subsidised fertilisers
- Facility to update bank details, mobile numbers and other details of farmers, family members, and authorised persons
- Crop sown registry based on digital crop survey to be integrated at a later stage

Way Forward

Fertiliser administration reforms have been carried out in other countries, wherein the fertiliser requirement has been based on standard norms. In India, as it involves a paradigm shift and fertiliser is a sensitive subject, it may be prudent to carry out pilots in one district of a few States, which have relatively robust and well-developed agri-stack systems. Based on the results of these pilots, the decision on the future mode of fertiliser subsidy administration may be made, considering all the relevant factors.

9.30 The government is implementing the Crop Residue Management Scheme from 2018-19 to support the efforts of the Punjab, Haryana, Uttar Pradesh and NCT of Delhi to address air pollution and subsidise machinery required to manage crop residue. Under the scheme, financial support is also given to take up large-scale demonstrations of the Bio-Decomposer on farmers' fields, a microbial consortium of fungal species that accelerates the in-situ decomposition of paddy straw. During the 2023 season, the bio-decomposer was used by the States in an area of around 7.00 lakh hectares. During the period from 2018-19 to 2023-24, the funds amounting to ₹ 3.34 Thousand Crore have been released to Punjab, Haryana, UP, NCT of Delhi and Implementing Agencies like the Indian Council for Agriculture Research(ICAR) etc. The states have established more than 40,000 CHCs of crop residue management machines, and more than 2.95 lakh crop residue management machines have been supplied to these CHCs and individual farmers in these states. Through these initiatives of the Government for in-situ and ex-situ management of paddy straw, the paddy stubble burning incidences in the States of Punjab, Haryana and Uttar Pradesh were lower by 24 per cent in the 2023 season as compared to the year before.

Box IX.5: Digital Agriculture: Path to digital revolution

India's agricultural sector is undergoing a significant transformation with the integration of digital technologies. The Digital Agriculture Mission 2021–2025 aims to modernise agriculture through advanced technologies like AI, remote sensing, drones, etc. Further, per the Budget Announcement for 2023-24, the government has taken various initiatives to build Digital Public Infrastructure (DPI) for agriculture as an open source, open standard and interoperable public good. DPI will enable inclusive, farmer-centric solutions through relevant information services for crop planning and health, improved access to farm inputs, credit, and insurance, help for crop estimation, market intelligence, and support for growth of agri- tech industry and start-ups.

Agri Stack is one of the prominent DPIs with three foundational registries (databases) i.e. Farmers' Registry/Database, Geo-referenced village maps and the Crop Sown Registry/Database, along with several Support Registries/Databases. The 3 foundational Registries will enable digitally authenticable Identities and non-repudiable digital assets for the farmer in the form of Farmer IDs, geo-tagged farm plots and Crop crop-sown data. The Krishi Decision Support System (Krishi-DSS) is another DPI, which aims to integrate and store in a standardized form relevant geospatial and non-geospatial data, such as remote-sensing data, weather data, soil data, crop signature library, reservoir data, groundwater data, and data pertaining to Government schemes.

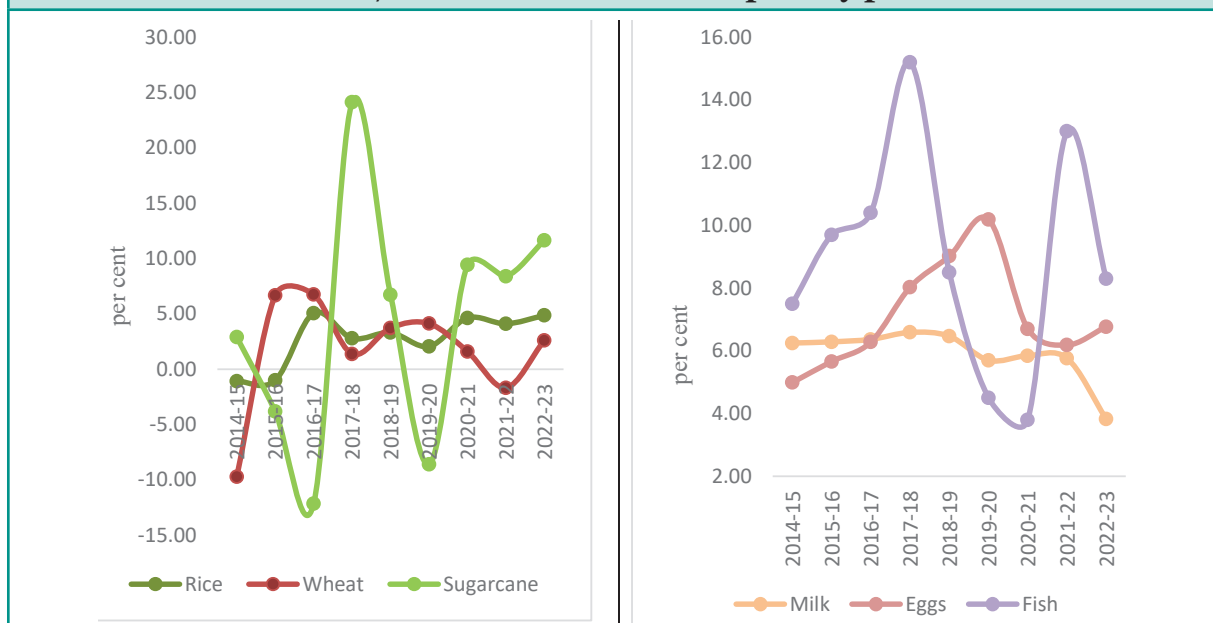
Further, other initiatives have been taken to strengthen the agriculture sector, such as (i) Krishi Mapper - a geospatial mobile application for all the land-based schemes, which enables geo-fencing (polygon creation / latitude-longitude) capture also incorporating Geo-tagged photographs from the current location of survey / inspection, (ii) Comprehensive Soil Fertility and Profile Mapping – for suitable soil health-related interventions, (iii) Digital General Crop Estimation Survey - accurately measure crop yields, through crop cutting experiments on randomly selected plots.

The push towards digital agriculture in India is supported by a robust ecosystem which visualises support of over 1,000 agri-tech startups in agriculture and allied sectors. As of 9 February, 2024, 554 agri-start-ups, including 387 women-led start-ups, are working in the agriculture & allied sector.

ALLIED SECTORS: ANIMAL HUSBANDRY, DAIRYING AND FISHERIES ARE SIGNIFICANT GROWTH DRIVERS

9.31 The allied sectors of Indian agriculture are steadily emerging as robust growth centres and promising sources for improving farm incomes. From 2014-15 to 2022-23, the livestock sector grew at an impressive Compound Annual Growth Rate (CAGR) of 7.38 per cent at constant prices. The contribution of livestock to the total GVA (at constant prices) in agriculture and allied sectors increased from 24.32 per cent in 2014-15 to 30.38 per cent in 2022-23. In 2022-23, the livestock sector contributed 4.66 per cent of the total GVA, significantly boosting the per capita availability of milk, eggs, and meat. The fisheries sector, a crucial contributor to the Indian economy, makes up about 6.72 per cent of the agricultural GVA and has grown at compound annual rate of 8.9 per cent between 2014-15 and 2022-23 (at constant prices). This “sunrise sector” supports approximately 30 million people, particularly marginalised and vulnerable communities.

Chart IX.7: Growth of cereals and poultry products



Source: Third Advance Estimate, Ministry of Agriculture and Department of Animal Husbandry and Department of Animal Husbandry & Dairying

9.32 Recognising the increasing relevance of the allied sector in agricultural growth and as a buoyant source of farm income, several government initiatives are being implemented to enhance productivity, ensure animal health, and facilitate infrastructure development. The interventions include a focus on improving animal health (Livestock Health and Disease Control Programme), nurturing entrepreneurship development and per-animal productivity (National Livestock Mission) and promoting FPOs and Self-Help Groups. The Animal Husbandry Infrastructure Development Fund (AHIDF) facilitates investments from individual entrepreneurs, private companies, FPOs, and Section 8 companies and Dairy Cooperative (included by merging Dairy Processing and Infrastructure Development Fund in AHIDF) in key areas like dairy processing, meat processing, animal feed plants, and breed improvement technology. The government provides a 3 per cent interest subvention to the borrower and a credit guarantee of up to 25 per cent of total borrowing. As of May 2024, 408 projects have been sanctioned by the lending banks/ NABARD/NDDB worth ₹13.861 Crore, generating 40,000 direct employment opportunities and benefiting more than 42 lakh farmers.

9.33 In 2022-23, India achieved a record fish production of 17.54 million tons, ranking third globally and accounting for 8 per cent of global production. To bolster this sector, a comprehensive intervention has been developed in the form of Pradhan Mantri Matsya Sampada Yojana (PMMSY) with the objective to enhance seed and fish production and other extension services. To address the sector's infrastructure needs, the Fisheries and Aquaculture Infrastructure Development Fund (FIDF) was introduced in 2018-19 with a total fund size of ₹7.52 Thousand Crore. So far, 121 proposals have been recommended for ₹5.59 Thousand Crore as a concessional rate⁴¹.

Cooperative Societies- Empowering farmers by strengthening communities

9.34 Cooperatives are vital in aggregating produce, enhancing bargaining power, and ensuring better market access to small and marginal farmers, thereby preventing exploitation by middlemen and traders. This was seen in the case of the dairy cooperative's movement, which focused on small rural producers (those with 1-2 hectares of land holding)⁴². There is a realisation that Primary Agriculture Credit Societies (PACS) can be useful vehicles for facilitating the convergence of various schemes intended for farmers' welfare, improving their effectiveness and reach through better participation of the small and marginal farmers in development programmes. The government approved a scheme in 2023 with the target of setting up PACS in the next five years in the Panchayats/Villages yet to be covered.

9.35 There has also been an increase in the number of single-state and multi-state cooperatives⁴³ (MSCs). As of March 2024, there are 8.03 lakh single-state and 1614 multistate cooperatives. Further, under the Multistate Cooperative Societies Act 2002, three new MSCs - National Cooperative Exports Limited (NCEL), Bhartiya Beej Sahakari Samiti Limited (BBSSL) and

41 Department of Fisheries

42 <https://amul.com/m/a-note-on-the-achievements-of-the-dairy-cooperatives>

43 Cooperative societies with objects confined to one State only are governed by the Cooperative laws of the respective State Government and the cooperative societies with objects confined to more than one State are governed by the central law, namely, the Multi-State Co-operative Societies.

National Cooperative Organics Limited (NCOL)-have been established at the national level. The new cooperatives seek to promote exports, facilitate access to improved seeds under a single brand name, and work toward the production, distribution, and marketing of certified and authentic organic products. The response to the setting of the three national-level cooperatives has been promising both in terms of the acceptance evident from applications received for membership and the permissions already received for the export of cereals to several countries. As of 31 March 2024, NCEL has received 7,318 applications for membership from 19 States & 03 UTs. It has so far got permission for exports of 15.02 LMT non-basmati white rice to 16 countries, 9.99 LMT broken rice to 07 countries, 50,000 MT sugar to two countries, and 14,184 MT wheat grain, 5326 MT wheat flour & 15.22 lakh MT maida/semolina to one country. As of 31 March 2024, BBSSL has received 16,775 applications for membership from 32 States/UTs. As of 31 March 2024, 5,154 applications for membership have been received from 26 States/UTs. NCOL has launched 11 products- arhar, chana, moong, kabuli chana, masoor, rajma, jaggery powder, sugar, besan, daliya, and jowar atta, under the Bharat Organics Brand.

Box IX.6: Initiatives to address scope and functioning of PACS

Several initiatives taken to improve the functioning and scope of work of the PACS include the following:

- With the view to improving efficiency, the PACS/Large Area Multipurpose Societies (LAMP) are being linked with the National Bank for Agriculture and Rural Development (NABARD) through a single National Software Network. So far, proposals for the computerisation of 67009 PACS have been sanctioned across 30 states/UTs, and ₹654 Crore to the States and ₹141 Crore to NABARD have been released.
- A grain storage programme, which will be the world's largest decentralised storage program, is planned in the cooperative sector to ensure food security and reduce wastage. Under this scheme, agricultural infrastructure, such as godowns, custom hiring centres, processing units, fair price shops, etc., are being created through the convergence of various existing schemes of the Government of India at the PACS level. The pilot project in 11 PACS of 11 States has been initiated while the construction of godowns in 500 additional PACS is approved.
- The scope of work of the PACS has been increased to allow them to function as common service centres for better access to e-services, provide LPG distributorship to increase employment opportunities and improve the financial strength of the PACS, to convert bulk consumer petrol pumps operated by PACS into retail outlets and to give priority for new petrol/diesel pump dealership.
- PACS will function as Janaushadhi Kendra and Pradhan Mantri Kisan Samridhi Kendra, including as drone entrepreneurs. Further, PACS will be eligible as 'paani samiti' to undertake operations and maintenance work for the piped water supply and will be responsible for setting up decentralised solar power plants at the panchayat level.

9.36 In addition to the above, steps have also been taken to strengthen the governance of the cooperatives. The Multistate Cooperative Societies (Amendment) Act, 2023, which came into effect on 03 August 2023, seeks to enhance transparency and accountability and improve the election process in the multistate cooperative societies by supplementing existing legislation and incorporating the provisions of the 97th constitutional amendment that addresses several aspects such as the appointment of an ombudsman, introduction of concurrent audit, and stipulation of criteria of appointment of chief executive officer.

Chart IX.8: Number of single state and multi-state cooperatives registered by major states



Source: Ministry of Cooperation

Agriculture Research and Education: Pushing the frontiers of technology

9.37 Investment in agriculture research and support of enabling policies have contributed substantially to food security. It is estimated that for every rupee invested in agricultural research (including education), there is a payoff of ₹13.85. In 2022-23, ₹19.65 Thousand Crore was spent on agriculture research, equalling 0.43 per cent of the agricultural GVA.⁴⁴ There is a need to further strengthen research given the number of abiotic and biotic pressures the agriculture sector faces.

9.38 The Indian Council on Agricultural Research (ICAR), is the apex organisation in agriculture research in the country. It has worked in diverse areas of research covering crop and seed production, bio-fortified varieties of grains and oils, promotion of millets, animal production and health, agricultural mechanisation and post-harvest management, and fisheries. Farmers' outreach for agricultural technologies demonstration and skill upgradation are important aspects of the work carried out by ICAR. During 2022-23, 347 varieties/hybrids of 44 crops were released, and 99 varieties of horticultural crops were notified for commercial cultivation. In addition, 27 bio-fortified varieties of rice, wheat, maize, finger millet, mustard, soybean and

44 Department of Agriculture Research and Education (DARE)

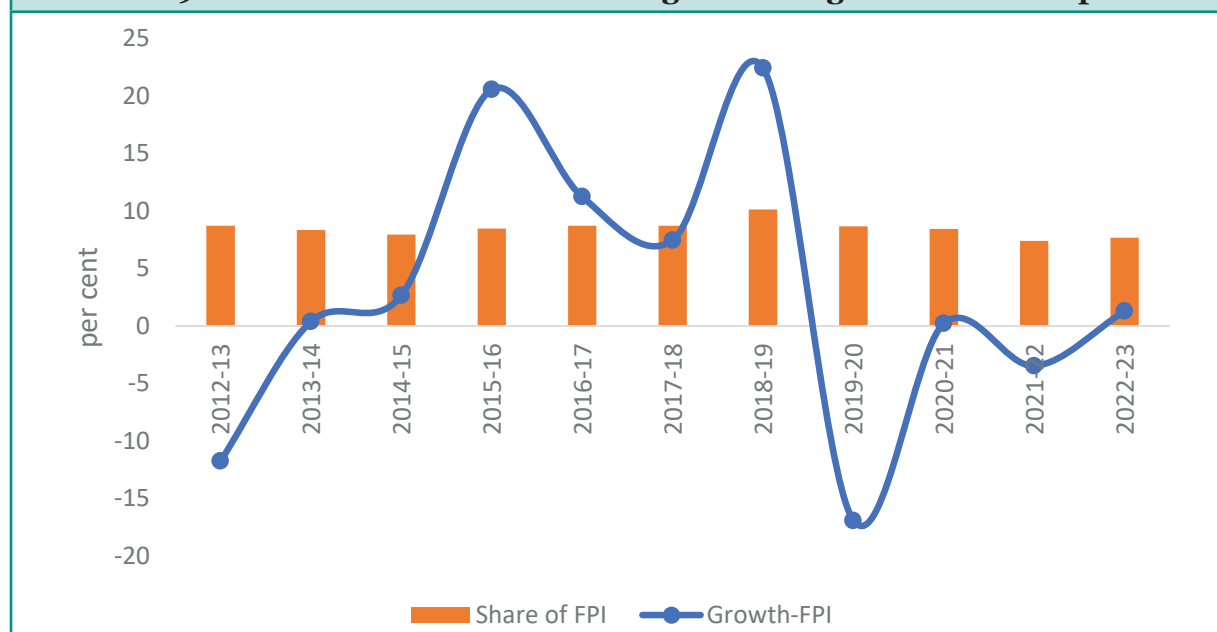
groundnut were released. Many of the rice varieties that India now exports to the rest of the world came out of research at the International Rice Research Institute. It is a reminder that agricultural research offers one of the highest returns on investment. Hence, reinforcing the agricultural research ecosystem with human and financial resources will continue to pay rich dividends to farmers and to the nation.

FOOD PROCESSING SECTOR (FPI): PROCESSING POTENTIAL

9.39 India is the largest producer of milk and the second largest producer of fruits, vegetables and sugar. The availability of reasonably priced agricultural inputs, the vast labour force, and continuously growing consumer demand provide the essential elements for a robust food processing industry. The sector also plays a vital role in reducing the wastage of perishable agricultural produce, enhancing the shelf life of food products, ensuring value addition to agricultural produce, and incentivises diversification & commercialisation of agriculture. True to that, the food processing industry in India is one of the largest employers in organised manufacturing, with a 12.02 per cent share in the total employment in the organised sector⁴⁵. The value of agri-food exports, including processed food exports during 2022-23, was USD46.44 Billion, accounting for about 11.7 per cent of India's total exports. The share of processed food exports also increased from 14.9 per cent in 2017-18 to 23.4 per cent in 2022-23.

9.40 It is an important industry because it has strong linkages with the agriculture sector and can employ surplus workforce released from the agriculture sector. During the last eight years ending 2022-23, the food processing industries has been growing at an average annual growth rate (AAGR) of around 5.35 per cent at 2011-12 prices. Being labour-intensive, the pandemic adversely affected the sector and it is now recovering. GVA in the food processing sector has increased from ₹1.30 lakh Crore in 2013-14 to ₹1.92 lakh Crore in 2022-23. The sector constituted 7.66 per cent of GVA in Manufacturing in 2022-23 at 2011-12 prices.

Chart IX.9: Share of FPI in manufacturing GVA and growth of FPI in per cent



Source: MoFPI

45 Ministry of Food Processing(MoFPI)

9.41 The Government has taken several initiatives to improve the supply chain management from farm gates to retail outlets. The Production Linked Incentive Scheme for the Food Processing Industry (PLISFPI) supports the creation of global food manufacturing champions, branding and marketing abroad. It is expected to create off-farm employment and provide better prices for farm produce and higher income to farmers. Presently, 173 applications are covered under the PLI Scheme. The beneficiaries of the scheme have invested ₹7.69 Thousand Crore. An incentive amount to the tune of ₹1.07 Thousand Crore was released in FY 2021-22 and FY 2022-23.

9.42 The PM Formalization of Micro Food Processing Enterprises (PMFME) scheme with a total outlay of ₹10 Thousand Crore provides credit-linked subsidy and capacity building, including marketing and branding support. Convergence is being sought with the existing ecosystem to support and complement other schemes such as the National Rural Livelihood Mission, National Urban Livelihood Mission, One District One Product, AIF, and PMKSY implementation. All State/UTs have appointed a state nodal agency, constituted state level approval committee & district level committee for implementation of the scheme. Further, 2 national level technical institutes and 44 state level technical institutes in 36 States/ UTs have also been approved. Against the target of two lakhs, 3,53,608 applications were received, and a loan amount of ₹6.94 Thousand Crore to 86,342 applicants was sanctioned. 522 Master Trainers from 35 States/UTs and 1068 District Level Trainers from 26 States/UTs and 70,936 beneficiaries from 30 States/UTs have been trained.

9.43 The scheme for developing the Tomato, Onion and Potato (TOP) value chain was launched in 2018-19. The coverage of Operation Green has been expanded from 3 crops (tomato, onion & potato) to 22 perishables crops, which include 10 fruits, 11 vegetables (including TOP) and one marine, i.e. shrimp. The scheme's objectives include enhancing farmers' value realisation, reducing post-harvest losses, increasing food processing capacities, and adding value. The scheme has two-pronged strategies: Price Stabilization Measures (short-term measures) and Integrated Value Chain Development Projects (long-term). Under the short-term interventions of the scheme, there is a provision for a 50 per cent subsidy on the cost of transportation and storage for fruits & vegetables for evacuation of surplus production from production centres during the glut situation. For the long-term, grant-in-aid is provided in the range 35 per cent to 50 per cent for setting up food processing project for eligible crops in the identified production clusters in major producing states.

FOOD MANAGEMENT⁴⁶: SOCIAL NET FOR FOOD SECURITY

9.44 The main objectives of food management are the procurement of foodgrains from farmers at remunerative prices, the distribution of foodgrains to consumers, particularly to the vulnerable sections of society, at affordable prices, and the maintenance of food buffer stocks for food security and price stability. The instruments used are procurement at MSP from farmers and Central Issue Price (CIP) for consumers. The nodal agency that undertakes the procurement, distribution, and storage of food grain is the Food Corporation of India (FCI).

46 Food Price Inflation is covered under Chapter 5- Prices and Inflation

For prudent management of foodgrain stock and for ensuring adequate availability of wheat and rice in the central pool, the Central Government implements a decentralized procurement scheme.

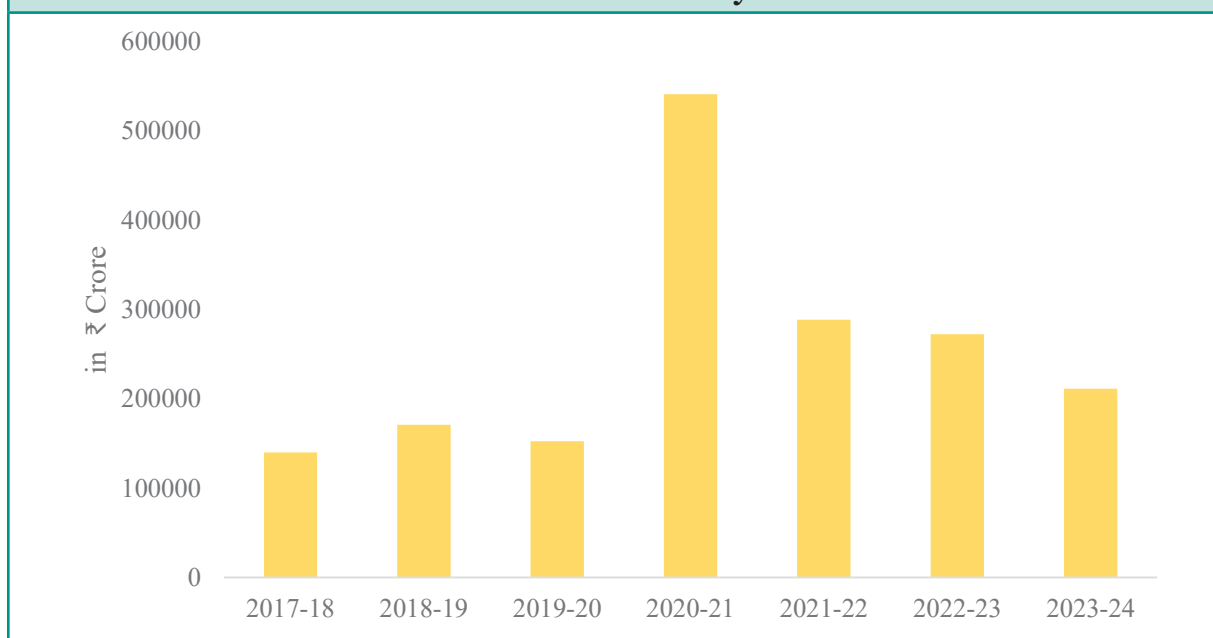
9.45 As of 24 May 2024, procurement of wheat during the Rabi Marketing Season(RMS) 2024-25 is going smoothly in the major procuring States nationwide, with 263.33 LMT of wheat already procured for the central pool, surpassing last year's total procurement of 262.02 LMT. A total of 22.42 lakh farmers have been benefitted during RMS 2024-25. Similarly, 489.20 LMT of rice was procured directly from 98.26 lakh farmers during the Kharif Marketing Season (KMS) 2023-24. With the above procurement quantity, the combined stock of wheat and rice in central pool has surpassed 600 LMT, which puts the country in a comfortable position to meet its requirements for food grains.

9.46 The distribution of food grains is undertaken primarily under the National Food Security Act, 2013 (NFSA) and other welfare schemes of the Government of India, including PMGKAY. The government has addressed the issue of food security at the household level for a long time through the public distribution system and the targeted public distribution system, as well as the enactment of the NFSA 2013. Further, the Government decided to continue to provide free food grains to about 81.35 crore beneficiaries (i.e., Antyodaya Anna Yojana (AAY) households and Priority Households (PHH) beneficiaries) under the PMGKAY for a further period of five years with effect from 01 January 2024, with an estimated total financial outlay of ₹11.80 lakh Crore to be borne by Central Government. The scheme provides a unified institutional mechanism with uniform prices and quantities across the country and removes difficulties for beneficiaries, especially migrants, under the One Nation One Ration Card (ONORC). Through this system, migrant beneficiaries can claim from any Fair Price Shop (FPS) of their choice, anywhere in the country, based on existing/same ration card in a seamless manner by using either their ration card or Aadhaar number after biometric/ Aadhaar authentication on ePoS device.

9.47 The procurement of foodgrains at MSP and distribution of foodgrains at less than economic cost have financial implications for the government. The economic cost⁴⁷ of both wheat and rice witnessed a significant increase during the last few years due to an increase in MSPs and a proportionate increase in the incidentals. The economic cost of rice and wheat for the year 2023-24(RE) is at ₹ 3931.34 per quintal and ₹ 2709.59 per quintal, respectively⁴⁸.

47 The economic cost of foodgrains consists of three components, namely, pooled cost of grains, procurement incidentals and the cost of distribution.

48 Based on FCI food bulletin data April, 2024

Chart: IX.10: Food subsidy released

Source: Department of Food and Public Distribution

Note:

- In addition to net subsidy released to FCI, Repayment of NSSF loan of ₹25,000 Crores in FY 2016-17, ₹ 40,000 Crore in FY 2017-18, ₹70,000 Crore in FY 2018-19 & ₹44,164.02 Crore in FY 2019-20 by FCI. ₹3,39,236 Cr for FY 2020-21 released from food subsidy has been adjusted for repayment of NSSF loan. Excludes ₹11,436 crore repaid to FCI from DCP States Head.
- The RE, 2019-20 was ₹33508.35 crore. The subsidy released includes ₹11,436 crore (as part of the NSSF loan), released from FCI to DCP States and returned to FCI in 2020-21.
- During FY 2023-24, ₹336.64 Crores were re-appropriated in favour of NESAs Division for Central Assistance.

CONCLUSION

9.48 The performance of the agriculture sector remains critical for the economy's growth and has been growing at an average growth rate of 4.18 per cent over the last five years. The growing significance of allied sectors such as animal husbandry, dairying, and fisheries in enhancing farmers' income suggests that greater emphasis should be placed on tapping into the potential of these activities to boost farmers' incomes. Smallholder farmers' incomes cannot be increased by producing rice, wheat, or even millets, pulses and oilseeds. They need to move to high-value agriculture – fruits and vegetables, fisheries, poultry, dairy and buffalo meat. Once the incomes of smallholders increase, they will demand manufactured goods, spurring a manufacturing revolution. That is what happened in China between 1978 and 1984 when the real incomes of farmers doubled in just 6 years. India is well-placed to emulate this.

9.49 Promoting crop diversification towards oilseeds, pulses, and horticulture requires addressing critical issues such as investment in agri-infrastructure, credit accessibility and appropriate market institutions. MSP has incentivised crop diversification and there is evidence that MSP has a positive and statistically significant effect on retail prices of all crops, with a stronger effect for those crops where procurement is substantial, such as paddy and wheat.⁴⁹

49 <https://rbidocs.rbi.org.in/rdocs/AnnualReport/PDFs/oANREPORT201718077745EC9A874DB-38C991F580ED14242.PDF>

Efforts must be made to encourage production patterns and practices in various geographies that are consistent with their agro-climatic characteristics and natural resources. Research and development and promotion of digital technologies in agriculture, as well as improving the quality of seeds, including promoting organic and natural farming, can play a significant role in the realisation of sustainable agriculture practices that efficiently improve farm income and influence farmer behaviour.

9.50 Enhancing private sector investment in agriculture is vital to provide impetus to the agriculture sector. Investment in technology, production methods, marketing infrastructure, and reduction in post-harvest losses need to be scaled up. A greater focus on post-harvest infrastructure and the development of the food processing sector can reduce wastage/loss and increase the length of storage, ensuring better prices for the farmers. Productivity of the crop sector can also be enhanced through greater investment, including from the private sector.

9.51 E-NAM, promoting FPOs, and allowing cooperatives to participate in agri-marketing can improve the market infrastructure and allow better price discovery. Improving the market infrastructure by incentivising states can be explored. This can be done by creating an index to rank states, allowing the participation of cooperatives, and enabling remunerative returns to investors according to the functioning of their APMCs and other market institutions. Such a competitive framework can drive states to strive for improved agricultural marketing. It is also worth considering providing financial incentives for states to undertake necessary interventions to modernise agriculture marketing as recommended by the 15th Finance Commission.

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INDUSTRY: SMALL AND MEDIUM MATTERS

Industrial growth accelerated in FY24, with manufacturing and construction leading the way. Industrial GVA at constant prices in FY24 was 25 per cent higher than the pre-Covid FY20 levels, affirming broad-based recovery and consolidation. This was supported by greater credit offtake, a thrust on capital formation to shore up infrastructure-oriented sectors, and a supportive policy framework.

In the last decade, there were considerable changes in the sectoral composition of India's manufacturing landscape. Some consumer-oriented industries like automobiles, wood products, furniture and pharmaceuticals have made large gains in output share and production-oriented sectors like machinery, chemicals, non-metallic minerals, and rubber and plastic products have also had share gains, balancing the growth dynamics. At a same time, sectors like petroleum products, textiles, beverage and tobacco have witnessed gradual decline in their output share.

Going forward, invigorating ongoing efforts to impart greater efficiencies, skills, and dynamics to labour-intensive segments like textiles, food processing, and MSMEs would lend greater balance to industrial expansion. Incentivising R&D investment, greater formalisation of smaller manufacturers, alleviating their supply chain bottlenecks, facilitating market access and improving access to finance will also foster industrialisation. Further reduction in the compliance burden for MSMEs will considerably improve their growth prospects.

Domestic demand conditions on account of consumption and investment are strong and conducive to smooth industrial output expansion in the near term. A forward-looking survey of the Reserve Bank of India on business expectations and industrial outlook presents a positive outlook. However, headwinds persist in terms of uncertain global demand conditions and prices of key inputs for which India is import-dependent.

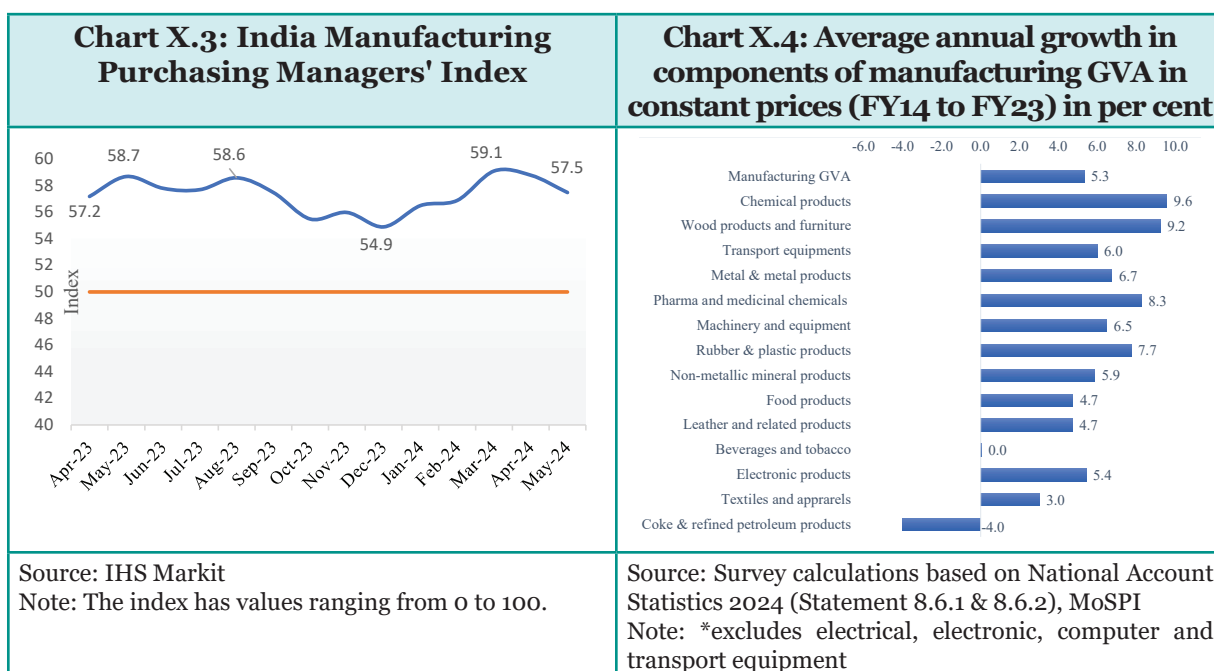
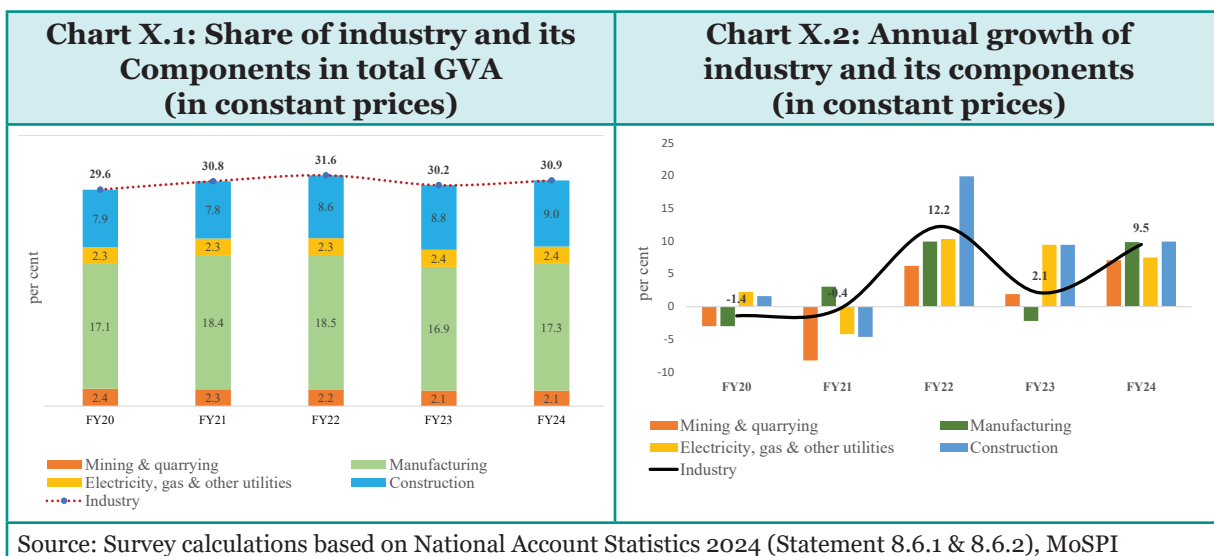
INTRODUCTION

10.1 Economic growth of 8.2 per cent in FY24 was supported by an industrial growth of 9.5 per cent.¹ Among the four sub-sectors of industry, manufacturing and construction achieved close to double-digit growth, while mining & quarrying and electricity & water supply also recorded strong positive growth in FY24. This reflects the broad-based acceleration of

¹ As per the provisional estimates of GDP released by the Central Statistics Office on 30 May 2024. This is greater than the 9 per cent industrial growth estimated in the second advance estimates of GDP released in February 2024, indicating faster than anticipated expansion of industrial output during the latter part of FY24.

industrial output. The HSBC India Purchasing Managers' Index (PMI) for manufacturing also consistently remained well above the threshold value of 50 in all months of FY24, indicating sustained expansion and stability in India's manufacturing sector.

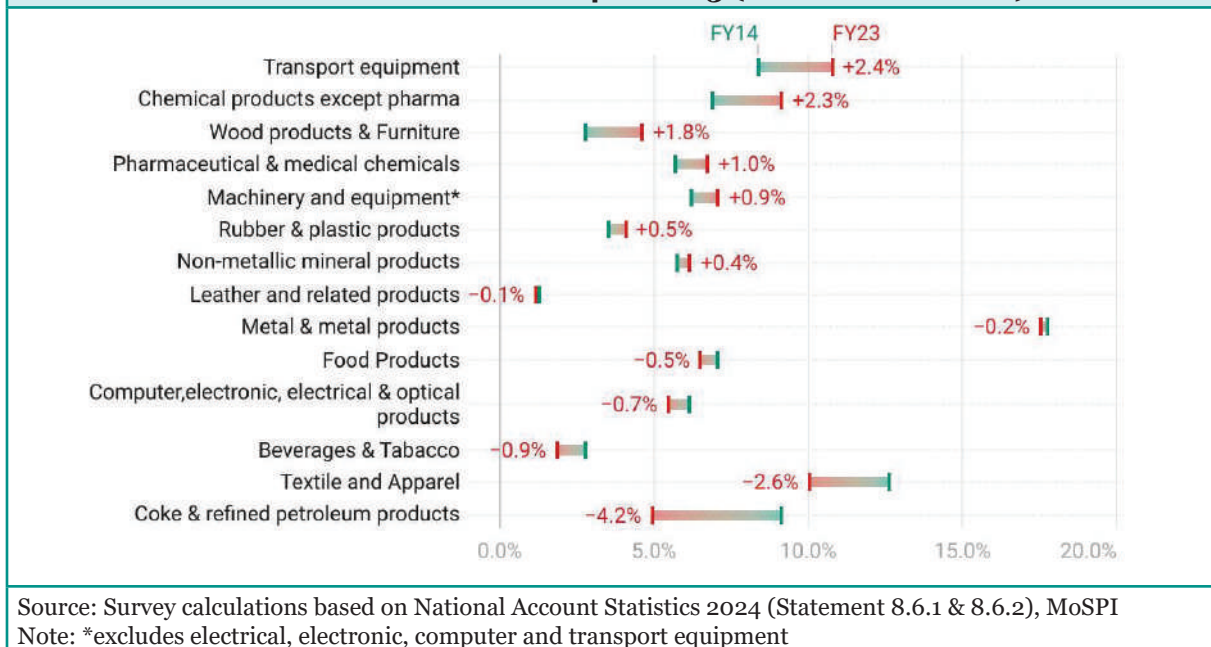
10.2 The share of manufacturing in total gross value added at current prices was 14.3 per cent in FY23. However, the output share is 35.2 per cent during the same period, indicating that the sector has significant backward and forward linkages that are not fully captured within its value-added share. About 47.5 per cent of the total value of output in the country is used as inputs in productive activities (inter-industry consumption)². Manufacturing activities account for about 50 per cent of the inter-industry consumption and, at the same time, supply almost 50 per cent of inputs used in all productive activities (agriculture, industry and services).



2 As per the Supply and Use Tables published by the Central Statistics Office for FY20.

10.3 Despite the pandemic and consequent impairment of manufacturing value chains, the manufacturing sector achieved an average annual growth rate of 5.2 per cent in the last decade. The manufacturing sub-sectors witnessed considerable realignment in output shares in the last decade. Catalysts of manufacturing growth in the last decade included chemicals, wood products and furniture, transport equipment, pharmaceuticals and machinery and equipment. Out of them, the expansion of steel, machinery and equipment, wood products, and transport equipment signifies a thrust on capital formation in the economy, especially in the public sector.

Chart X.5: Change in share of manufactured products GVA in total GVA between FY14 to FY23 (in constant Prices)



10.4 India's industrialisation was held in check by the absence of physical infrastructure and logistics as well as intrusive and cumbersome licensing requirements on capacity creation and expansion. Further, the manufacture of specific items was reserved for the small-scale sector. Much of these restrictions have been now lifted, and physical infrastructure is being created at a rapid pace. Connectivity has improved. The Goods and Services Tax has created a single market for several commodities, enabling manufacturing at scale. However, India faces stiff challenges in growing its manufacturing base. Public policy must do whatever it can to boost competitiveness. Action lies predominantly in deregulation. The private sector must think long-term and invest in quality through R&D spending. These may not be sufficient, but they are necessary conditions for the growth of the sector. Manufacturing still has the ability to generate low and semi-skilled jobs and bring development closer to the people. India needs to prioritise the sector.

10.5 The remaining sections of the Chapter are organised in the following way. The next section examines progress, challenges and policy initiatives in different industrial segments, such as key industrial intermediates and consumer-oriented industries³. This is followed by a brief discussion on cross-cutting themes like production-linked incentives (PLIs), micro, small

³ Fertiliser is covered in chapter 9 on Agriculture and Food Management

and medium enterprises (MSMEs), central public sector undertakings (CPSEs) and industrial R&D and innovation. The final section concludes the discussions and provides a wayforward.

PERFORMANCE OF KEY SECTORS AND RELATED ISSUES

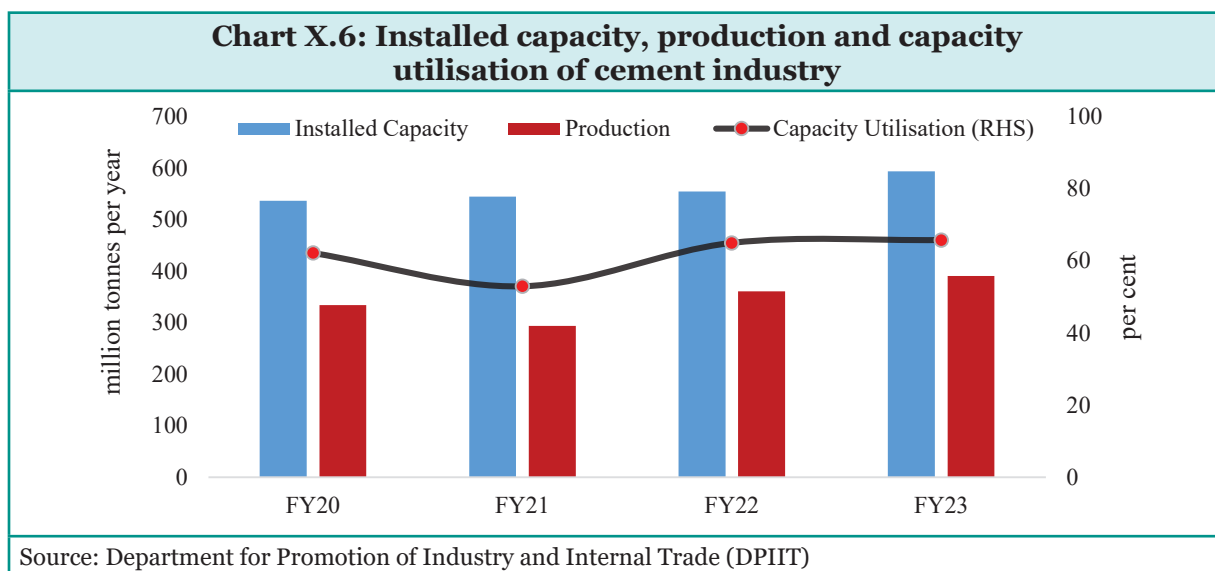
Key Industrial Intermediates

Cement: Building the future

10.6 The cement industry contributes approximately 11 per cent of the input cost to the construction sector in India.⁴ Since de-licensing in 1991, the cement industry has progressed significantly both in capacity and process technology, so much so that India is the second largest cement producer in the world after China.⁵

10.7 The Indian cement industry comprises 159 integrated large cement plants, 120 grinding units and 62 mini cement plants. The current annual installed capacity of the cement industry in India is about 622 million tonnes, with cement production of around 427 million tonnes in FY24. Most of the cement plants in India are located in proximity to the raw material source. 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.

10.8 The industry has adequate capacity to meet the domestic cement demand; the quantity of cement imported in the year FY23 is about 0.2 per cent of total domestic cement production. The export of clinker and other cement increased until FY19 and then started declining except for other hydraulic cement on account of lower global demand and increasing competition from other countries. In FY23, India exported only a negligible quantity of clinker.



⁴ National Accounts Statistics, 2023-24, Statement 8.8: Output and value added from construction, MoSPI

⁵ DPIIT

10.9 The industry has maintained a capacity utilisation rate of approximately 60-65 per cent in recent years. Reports also expect that the global demand for cement is likely to be flat during 2024-2030, with bright spots in demand emanating only from India, Africa, the Middle East and North America to an extent. Yet gross margins in the cement industry are likely to be robust globally, helped by higher prices and lower fuel costs.⁶

10.10 Domestic cement consumption in India is around 260 kg per capita against a global average of 540 kg per capita, signifying potential for growth. In the last ten years, the import of clinker has increased. However, the quantity of imports is still low.

10.11 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 and smart cities will boost cement demand significantly. The push for rural development and increased investment in industrial and commercial construction support growth prospects.

10.12 Globally, the cement sector generates about 7 per cent of the total anthropogenic emissions. The Indian cement industry has been working on the issue. Greenhouse gas emissions are estimated to have been reduced to 0.56 t CO₂ per tonne of cement in 2023. CO₂ emissions are targeted to be further reduced to 0.35 t CO₂ per tonne of cement by 2050, as estimated in the cement industry technology roadmap.⁷

Steel sector on the growth path

10.13 Iron and steel contribute approximately 47 per cent of all inputs in the building & construction sector.⁸ It also serves as a critical input for the production of machinery and consumer goods. The steel sector achieved its highest levels of production and consumption during FY24.

10.14 India became a net exporter of finished steel over the past decade. In FY24, India started off as a net exporter in Q1. However, in Q2 and Q3, it became a net importer. This was largely driven by price differentials between international and domestic prices of finished steel. Low prices in the international market led to reduced profit margins for exports and made imports more affordable, affecting the trade balance in steel. However, the import dependence on coking coal, an essential raw material for steel production went up from 56.1 MT in FY23 to 58.1 MT in FY24.

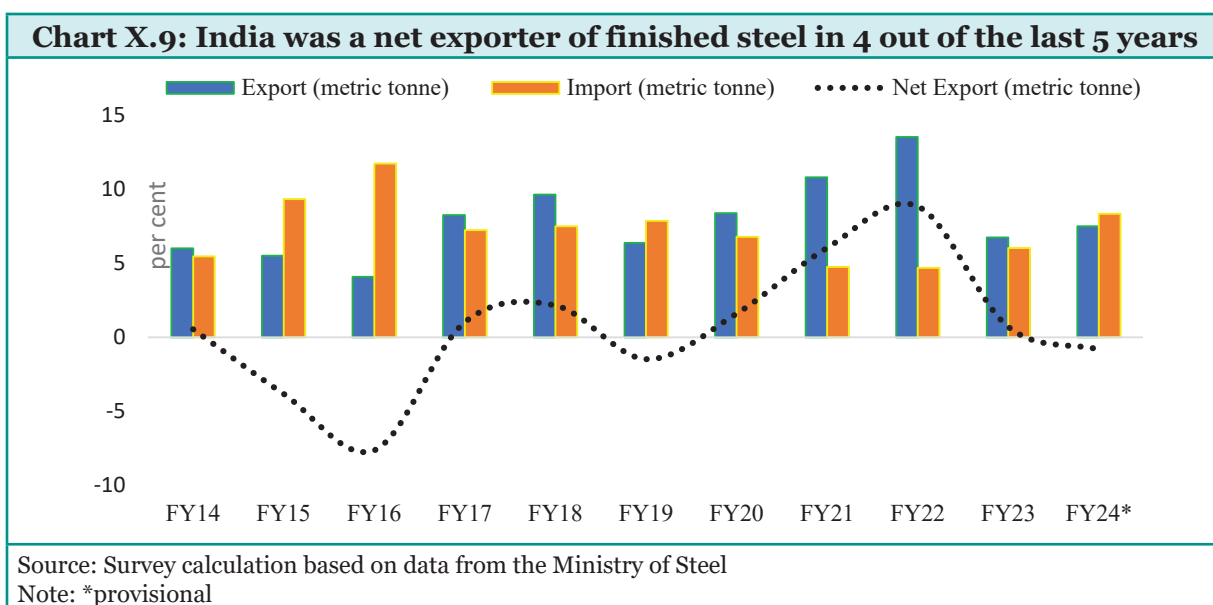
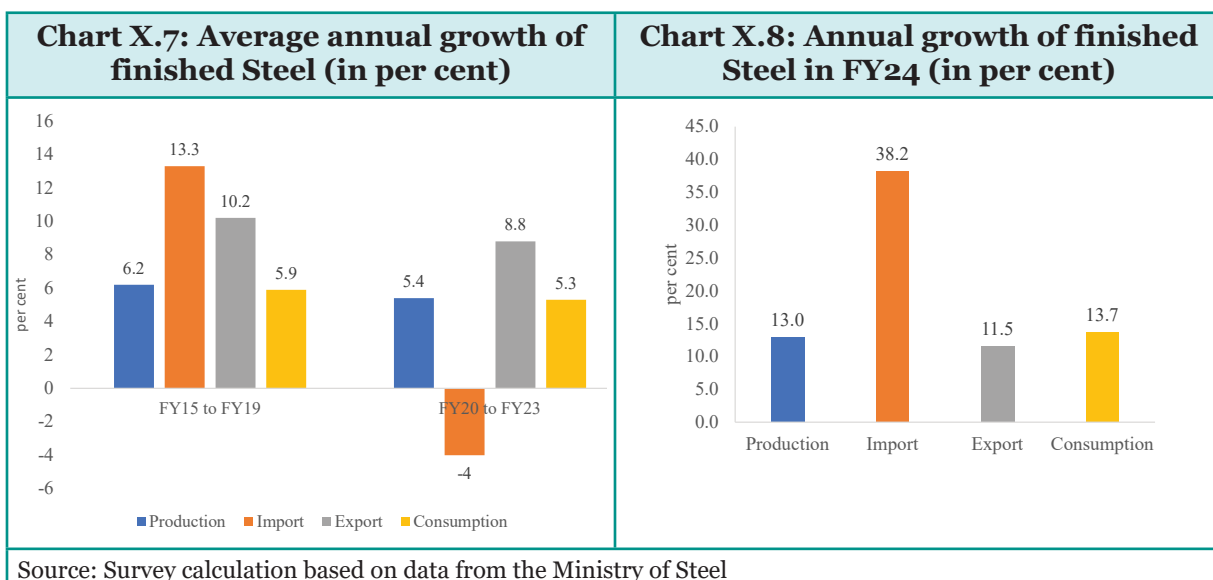
10.15 As the world moves towards a low-carbon economy, green steel is poised to play a pivotal role in reshaping the future of the steel industry. India's steel sector accounts for 12 per cent⁹ of India's greenhouse gas emissions with an emission intensity of 2.5 tonnes of CO₂ per tonne of crude steel compared to the global average of 1.9 tonnes of CO₂ per tonne of crude steel.

6 Global Cement Industry Outlook: Trends and Forecasts. Link: <https://www.worldcementassociation.org/blog/news/global-cement-industry-outlook-trends-and-forecasts>.

7 World Business Council for Sustainable Development, 2018

8 National Accounts Statistics, 2023-24, Statement 8.8: Output and value added from construction, MoSPI

9 Ministry of Steel



Box X.1: Steel sector initiatives

To achieve the goal of a self-reliant India and boost the steel sector, the Government established the Nagarnar Steel plant in Bastar district in October 2023, marking a significant milestone in India's steel production capabilities. The greenfield project is expected to produce high-quality steel, contributing to the socio-economic development of the region and positioning India as a key player in the global steel market. The plant is designed to produce a range of flat steel products. In FY24, the plant produced 4.93 Lakh tonnes of hot-rolled coils. Among the steel CPSEs, Steel Authority of India Limited achieved its best-ever production of hot metal, crude steel, and saleable steel in FY24.

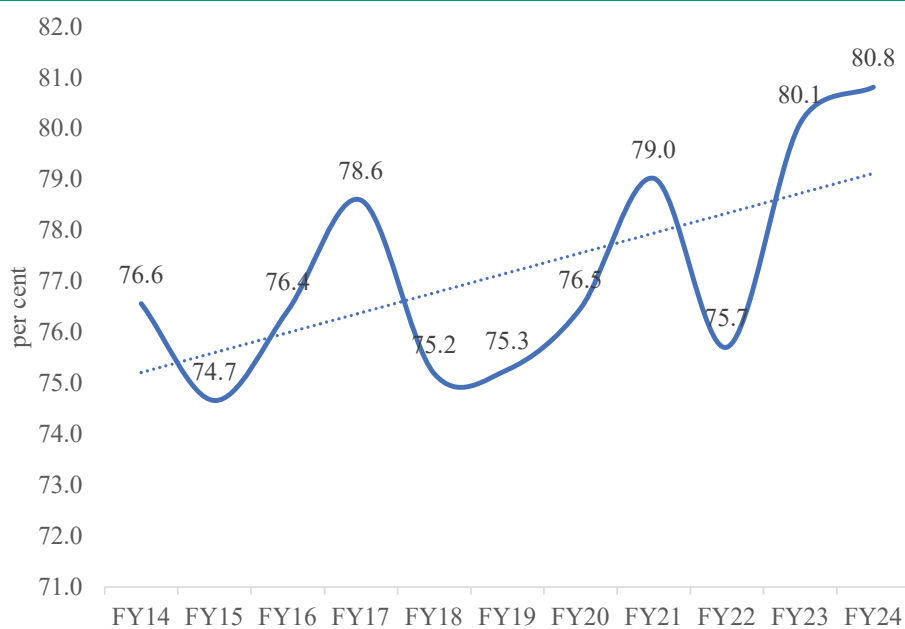
The PLI Scheme for speciality steel, approved in 2021, has attracted investment of ₹15,519 Crore till May 24. On 17.03.2023, Ministry of Steel signed Memorandum of Understanding (MOU) with the 27 selected companies having 57 applications. This scheme will attract total investment commitment of ₹29,531 Crore with capacity addition of 24,780 thousand tonnes.

Source: Ministry of Steel

Coal: Reducing external dependence

10.16 Coal accounts for more than 55 per cent of India's primary commercial energy. Coal-fired power generation accounts for about 70 per cent of the total power generation. Coal production accelerated in the last five years, leading to reduced import dependence. In FY24, India produced 997.2 million tonnes of coal, imported 261 MT and consumed 1233.86 MT¹⁰. The ratio of domestic production of coal to consumption improved gradually over the last decade as the growth in production outstripped the growth in consumption.

Chart X.10: Coal production as per cent of domestic consumption



Source: Survey calculation based on data from the Ministry of Coal

Table X.1: Growth in production, consumption and import of coal (CAGR in per cent)

Year	Production	Consumption	Import
FY14 to FY19	5.2	5.6	7.1
FY19 to FY24	6.5	5.0	2.1
FY24(YoY)	11.7	10.7	9.8

Source: Ministry of Coal

¹⁰ Ministry of Coal

Box X.2: Recent initiatives, challenges and opportunities in the coal sector

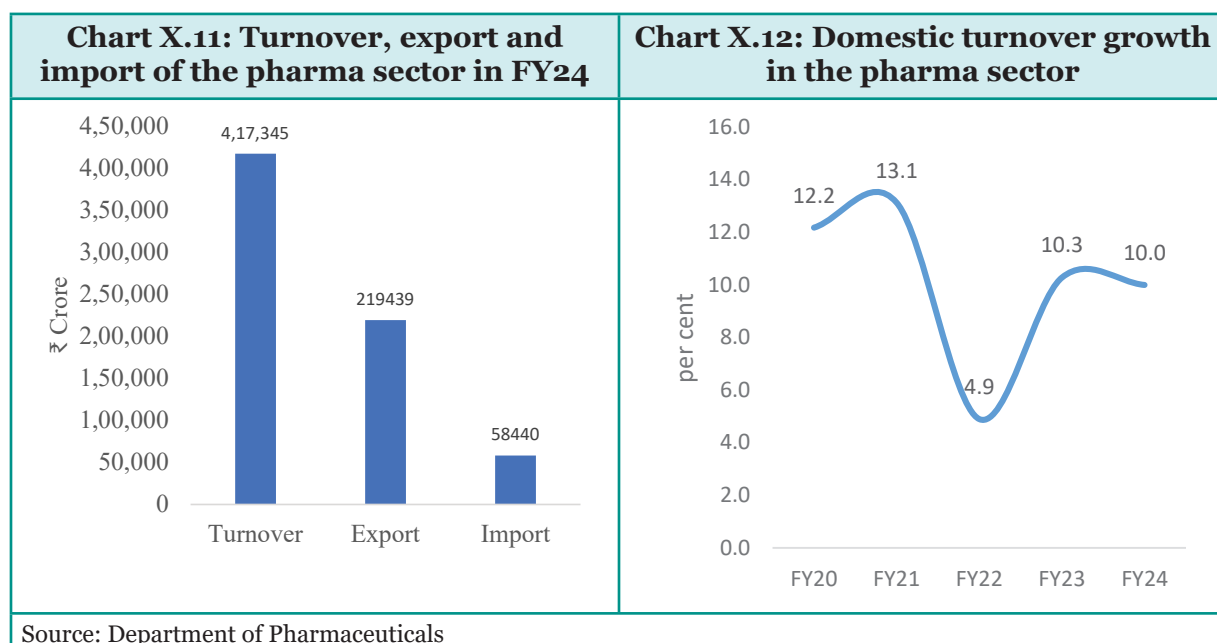
Recent Initiatives	Challenges, opportunities and options
<ul style="list-style-type: none"> • The government has set a target to gasify 100 MT of coal by 2030 to reduce imports. • A scheme with an outlay of ₹8500 Crore during 2023-24 to provide viability gap funding to coal/lignite gasification projects has been launched. • Launched Integrated Coal Logistics Policy and Plan in February 2024 to develop technologically enabled, integrated and cost-effective logistics for coal evacuation. • Notified the amended Coal Blocks Allocation Rules, 2017, in May 2023. • Coal India Limited (CIL) is venturing to set up 3,000 MW of renewable power capacity for power mining operations by 2025-26. During 2023-24, a total of 8.60 million units were generated from solar installations till December 2023. • CIL is gradually moving to a high-capacity coal evacuation system, making it more efficient and efficient by installing coal handling plants/silos under its 'First Mile Connectivity' projects. • CIL is pursuing the acquisition of critical mineral assets like lithium and cobalt in India and abroad. 	<ul style="list-style-type: none"> • Technological difficulties due to the limited availability of modern mining equipment from Indigenous manufacturers • Procedural complexities in acquiring forestry and environmental clearances, land acquisition, and possession need to be taken care of for the timely development of mining projects. • Need for sustainable solutions amid global environmental action. • To mitigate challenges, the industry is focusing on reducing emissions, improving energy efficiency, and adopting cleaner coal technologies. • In spite of an adequate domestic supply of thermal coal, only the substitutable part of the import can be replaced. Increasing demand for coking coal will push coking coal imports up. Coking coal beneficiation needs to be scaled up for blending with imported coal under the 'coking coal mission'. • Coal can be used as a green energy source, such as coal mine methane (CMM), coal bed methane (CBM), coal to liquid, and coal to methanol. The CMM and CBM need to be tapped progressively.
Source: Ministry of Coal	

Major Consumer-oriented Industries**Pharmaceuticals: Growing and Global Presence**

10.17. India's pharmaceutical market currently valued at USD 50 Billion is the world's third-largest by volume. With a diversified product base covering generic drugs, active pharmaceutical ingredients, bulk drugs, over-the-counter drugs, vaccines, biologics and biosimilars, the Indian

pharmaceutical industry has a strong presence at the global level. “Pharmacy of the world” as it is often called offers around 60,000 generic brands across 60 therapeutic categories, accounting for 20 per cent of global generic drug exports by volume. Not surprisingly, eight of the top 20 global generic companies are based in India.

10.18. India’s pharmaceutical sector boasts high rates of quality compliance, with 703¹¹ US FDA-approved facilities (as of April 2023), 386¹² European GMP-compliant plants (as of November 2022) and 2418¹³ WHO-GMP-approved plants. To further bolster the regulatory framework, in December 2023, revised pharma manufacturing rules were notified under Schedule-M relating to Good Manufacturing Practices, a mandatory requirement that safeguards quality and brings the existing regime in line with global standards.¹⁴



10.19. India’s pharmaceutical industry has traditionally been dependent on API imports from one country. The PLI schemes for bulk drugs and pharmaceuticals have helped stabilize the import of bulk drugs and improved our supply chain resilience. Under the scheme, fermentation-based manufacturing capabilities got strengthened through production of antibiotics such as Penicillin G and Clavulanic Acid. The CAGR of import of bulk drugs between FY22 and FY24 was 2.3 per cent, as compared to the CAGR of 5.9 per cent in their export. India has become a net exporter of bulk drugs. During FY24, the value of export and import of bulk drugs was ₹39,632 Crore and ₹37,722 Crore respectively.

11 Pharmaceutical Export Council of India, Handbook, 2023. Ministry of Commerce and Industry. Link: https://pharmexcil.com/uploads/files/Hand_Book_Design.pdf

12 Pharmaceutical Export Council of India, Handbook, 2023. Ministry of Commerce and Industry. Link: https://pharmexcil.com/uploads/files/Hand_Book_Design.pdf

13 https://cdsco.gov.in/opencms/opencms/system/modules/CDSCO.WEB/elements/industry_download.jsp?num_id=MTcyNQ==

14 Ministry Of Health And Family Welfare (Department of Health and Family Welfare) Notification New Delhi, the 28th December, 2023 <https://pharmadocx.com/wp-content/uploads/2024/01/Notified-Schedule-M-dt-28.12.2023-1.pdf>

10.20. The PLI scheme for medical devices is beginning to provide a positive impetus as reflected in the narrowing gap between export and import of medical devices. Production of several medical devices such as CT-Scan machines, Linear Accelerator (LINAC), Rotational Cobalt Machine, C-Arm, MRI, etc has started in the country.¹⁵

Box X.3: Recent Initiatives, Challenges and Outlook of the Pharma Sector

Aatmanirbharta Pursuit	Pradhan Mantri Bhartiya Janaushadhi Pariyojana	Challenges and outlook
<ul style="list-style-type: none"> Aims to boost domestic manufacturing of identified KSMs, DIs and APIs by attracting large investments and reducing import dependence on critical APIs. Under the PLI scheme for bulk drugs, 48 projects have been approved with a committed investment of ₹3938.6 Crore. The Scheme for the Promotion of Bulk Drug Parks provides support to establish three bulk drug parks for the creation of world-class Common Infrastructure Facilities. This will bring down the manufacturing cost of bulk drugs and improve India's competitiveness and drug security. 	<ul style="list-style-type: none"> The aim is to make quality generic medicines available at affordable prices to all. Pradhan Mantri Bhartiya Janaushadhi Kendras (PMBJKs) are open to provide generic medicines. Till now, more than 12500 PMBJKs have been opened, covering all districts. It has made an impact on the common masses and the poor by providing quality medicines at affordable prices. In FY23-24, Pharmaceuticals & Medical Devices Bureau of India sold Jan Aushadhi medicines worth ₹1470 Crore, leading to savings of approximately ₹7350 Crore. The Scheme is particularly delivering greater savings on medicines for chronic diseases. On average, 10–12 Lakh people visit Jan Aushadhi Kendras daily. 	<ul style="list-style-type: none"> India is largely dependent on imports for many antibiotic APIs manufactured through fermentation. India's import dependency is largely due to a lack of cost-effective options in domestic API manufacturing compared to imports. Domestic infrastructure and R&D capabilities have improved considerably in recent years, but challenges remain (Box X.10). Export growth occurred due to consistent innovation in the last 5-6 decades. The export growth can be sustained by increasing the capabilities in biopharmaceuticals manufacturing. Pharma industry is expected to reach US\$ 130 billion by 2030. The next leg of growth in pharma necessitates skill advancement, the use of innovation and technology, and the establishment of a strong supply chain.

Source: Department of Pharmaceuticals

15 PIB released on 17 Jan 2024 Link: <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1996964>

Box X.4: Need to Enhance and Reimagine Pharma R&D

The pharmaceutical industry worldwide can be divided into an innovator or a generic producer. As the name suggests, ‘innovator’ firms carry out extensive research to bring new medicines or treatments for diseases to the world. Considering the extent of time and resources as also the risk involved in the process, the prices of such medicines are usually very high. Such firms thrive on monopolies created through intellectual property rights owned by them for these new medicines. In recent years, big innovator pharma companies have made a strategic move to invest in smaller, more agile research-oriented firms. Between 2021 and 2023, the investment amounted to USD 54 billion in small bio-tech firms.¹⁶

India’s strength in the pharmaceutical sector lies in being a cost effective and efficient producer of existing off patented drugs- also called the generic industry. Even so research and development is key to producing the same medicines once they get off patent at a fraction of the cost of the original drug. They thrive on competition. The world needs both the innovators and those that can provide drugs at a reasonable price, with the latter playing a vital role in enhancing social benefits. Hence, the strength of the industry lies in having a diverse combination of innovators and generic producers.

As we move towards realising the vision of Viksit Bharat, it is vital to promote innovation. The R&D expenditure in the drugs and pharmaceutical sector in India averaged around 5 per cent of the sales turnover in FY20 and FY21¹⁷. The development of new drugs aimed at addressing unaddressed health concerns will improve the breadth and quality of healthcare access for the population, while producing better returns on investments.

The report “Indian pharmaceutical sectorial system of innovation”¹⁸ underscores the need for:

- i) fostering joint research amongst industry actors with the aim of making the sector more strategically collaborative rather than competitive.
- ii) bolstering industry-academic interactions for applied research, in particular better participation of public knowledge-based institutions.
- iii) reducing the rigidity of communication between knowledge-based institutions in order to foster better knowledge exchange and collaboration in the areas of research, particularly with the inclusion of Tier 2 and Tier 3 institutions.
- iv) supporting secondments and placements between knowledge-based institutions and industry in order to better orient human capital development.
- v) strengthening communication channels amongst the knowledge-based institutions and intermediaries, particularly industry associations.
- vi) increasing the channels of funding from venture capital and angel investors to support the process of ideation to market.

¹⁶ The Economist, Apr 30 2024, Can biotech startups upstage Eli Lilly and Novo Nordisk?

Link to access:(<https://www.economist.com/business/2024/04/30/can-biotech-startups-upstage-eli-lilly-and-novo-nordisk>)

¹⁷ R&D expenditure from Department of Science & Technology; and sales turnover from Department of Pharmaceuticals.

¹⁸ https://dst.gov.in/sites/default/files/Indian%20Pharmaceutical%20Sectorial%20System%20of%20Innovation%20%28IPSSI%29%20Report_o.pdf

vii) better knowledge sharing amongst government bodies to promote an 'all of government approach' to innovation thus translating into more coordinated joint research in strategic areas.

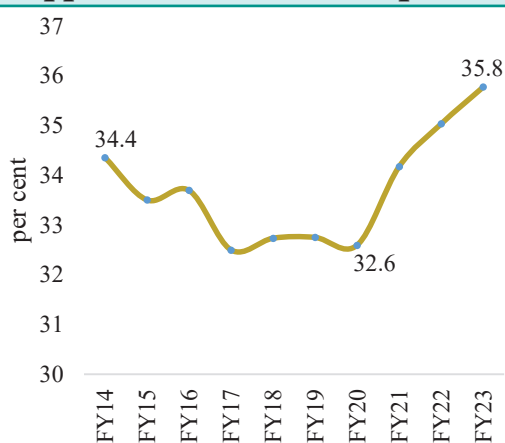
The government has taken several measures to create and nurture an ecosystem that promotes innovation. This is reflected in the setting up of centres for excellence to promote collaborative research in the pharmaceutical sector, and in artificial intelligence including for the health sector. The recently introduced Promotion of Research and Innovation in Pharma MedTech Sector is expected to herald a transformation in the pharmaceutical sector towards innovation.

Textile industry: Navigating challenges

10.21. As per the National Accounts published by the Central Statistics Office, textiles, including the wearing apparel sector, generated a gross value added of ₹3.77 lakh Crore in FY23, which was about 10.6 per cent of the manufacturing GVA at current prices during the year. The sector also accounted for 29.3 per cent of the total non-corporate manufacturing GVA and 7.9 per cent of the corporate manufacturing GVA in FY23.

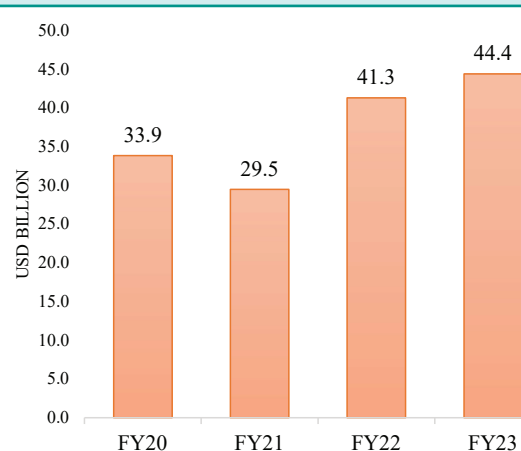
10.22. India has a robust end-to-end value chain in the textile industry, spanning raw materials like natural and MMF fibre to the final product and covering apparel, home textiles, and technical textiles. India is the world's second-largest clothing manufacturer and one of the top five exporting nations. In FY24, the export of textiles and apparel, including handicrafts, increased by 1 per cent, reaching ₹2.97 lakh Crore. The sector is diversified, with readymade garments accounting for the largest share (41 per cent) in the total exports in FY24, with exports of ₹1.2 lakh Crore, followed by cotton textiles (34 per cent) and man-made textiles (14 per cent).

Chart X.13: Share of non-corporate GVA in the total textile (including apparel) GVA in current prices



Source: National Account Statistics 2024, MoSPI

Chart X.14: Total exports of textile products



Source: Ministry of Textiles

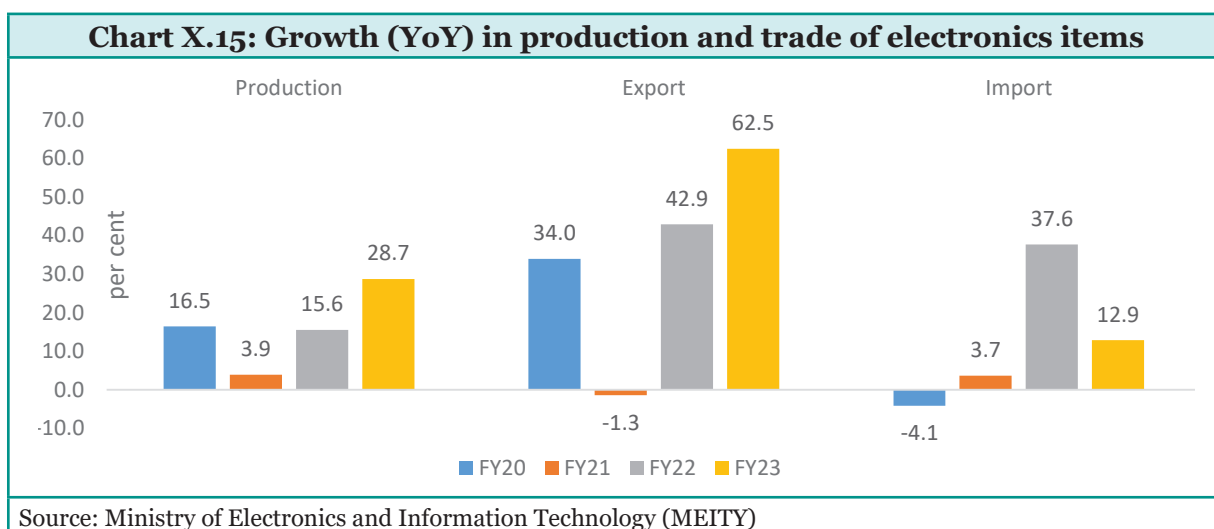
Box X.5: Challenges and supportive initiatives in the textile industry

Industry context and challenges	Supportive initiatives
<ul style="list-style-type: none"> The majority of India's textile and apparel production capacity is on account of MSMEs, which account for over 80 per cent of the sector, and the average scale of operations is relatively small. Thus, efficiency and economies of scale from large-scale modern manufacturing are limited. The fragmented nature of India's apparel sector, with raw materials sourced predominantly from Maharashtra, Gujarat, and Tamil Nadu, while spinning capacities are concentrated in southern states, contributes to higher transportation costs and delays. Other factors, such as India's heavy dependence on imported machinery, except in the spinning segment, inadequate availability of skilled manpower, technological obsolescence, etc, also act as significant constraints. NITI Aayog's recommendations for the sector include supporting domestic machine manufacturers through initiatives such as ATUFS, fostering R&D, and promoting innovation. Priorities also include creating world-class textile infrastructure with plug-and-play facilities. The focus will also be on technological upgradation, sustainability and circularity, quality and standards and promotion of handloom and handicraft products. 	<ul style="list-style-type: none"> Seven PM MITRA Parks, with a budget of ₹4,445 Crore, will be established from FY22 to FY28 in Tamil Nadu, Telangana, Gujarat, Karnataka, Madhya Pradesh, Uttar Pradesh, and Maharashtra. The parks will feature 1,000-acre industrial infrastructure and "plug and play" facilities. MoUs were signed with all seven states, with JVs and SPVs established in five states. The Government approved a PLI Scheme with ₹10,683 Crores over five years for man-made fibre apparel and fabrics and technical textiles. It is expected to attract over ₹19,000 Crore in investment and create 2.5 Lakh jobs. Launched with an outlay of ₹1,480 Crore for FY21 to FY24, the National Technical Textiles Mission focuses on increasing the use of technical textiles in various sectors. It has four components: research innovation & development, promotion and market development, education, training and skilling, and export promotion. It has been extended to March 2026, with a sunset clause until March 2028. 137 research projects for ₹474 Crore have been approved so far. The National Handloom Development Programme (NHDP) approved for FY22 to FY26 with an outlay of ₹998 Crore. In FY24, initiatives were undertaken to establish 96 small handloom clusters. Nine mega handloom clusters have also been set up.

Source: Ministry of Textiles

Electronics industry: Powering the future

10.23. India's electronics manufacturing sector has experienced significant growth since 2014, accounting for an estimated 3.7 per cent of the global market share in FY22. At the same time, the industry contributed 4 per cent to India's total GDP in FY22. Domestic production of electronic items increased significantly to ₹8.22 lakh Crore, while exports rose to ₹1.9 lakh Crore in FY23. India has become an attractive destination for investments in this sector, and substantial manufacturing capacities have been established in the country over the past five years. Many major brands, both foreign and domestic, have either established their own manufacturing facilities or have outsourced manufacturing to Electronics Manufacturing Services companies operating in India.



10.24. Research by the Centre for Development Studies¹⁹ shows that India has seen a significant increase in domestic value addition (DVA), employment, wages and salaries in mobile manufacturing segment since FY17. The share of DVA in mobile phone output rose from an average of 8.7 per cent in FY17 to FY19 (Phase 1) to 22 per cent in FY20 to FY22 (Phase 2), indicating considerable increase in local participation. While the DVA as a ratio of exports may be low, participating in global value chains (GVC) increases in overall value added because of economies of scale in manufacturing for the vast global market. The direct workforce in the production of mobile phones has more than tripled between FY17 to FY22, particularly benefiting female blue-collar workers. Wages and salaries increased by 317 per cent between phase 1 and phase 2. The study suggests that reducing service link costs is crucial for seamless participation in GVC, necessitating efforts to lower transaction costs. This recommends a comprehensive policy approach, including low import tariffs for intermediate inputs, to replicate success in other sectors.

19 Veeramani, C. (2024 forthcoming) "Gains from Mobile Phone Manufacturing in India through Backward Participation in Global Value Chains", Centre for Development Studies (CDS), Thiruvananthapuram, India

Box X.6: Initiatives to Boost Electronics Industry

The Indian government places a high priority on electronics hardware manufacturing, which is a key aspect of both the "Make in India" and "Digital India" initiatives. In order to attract and encourage significant investments in the electronics value chain and boost exports, the government has introduced several schemes: (i) Production Linked Incentive Scheme (PLI) for Large Scale Electronics Manufacturing, (ii) PLI IT Hardware, (iii) Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS), and (iv) Modified Electronics Manufacturing Clusters (EMC 2.0). These schemes have been instrumental in driving growth in the country's electronics sector. As a result, the CAGR in the production of electronics goods from FY18 to FY23 was 16.19 per cent, while the exports increased by 35.7 percent in the same period.

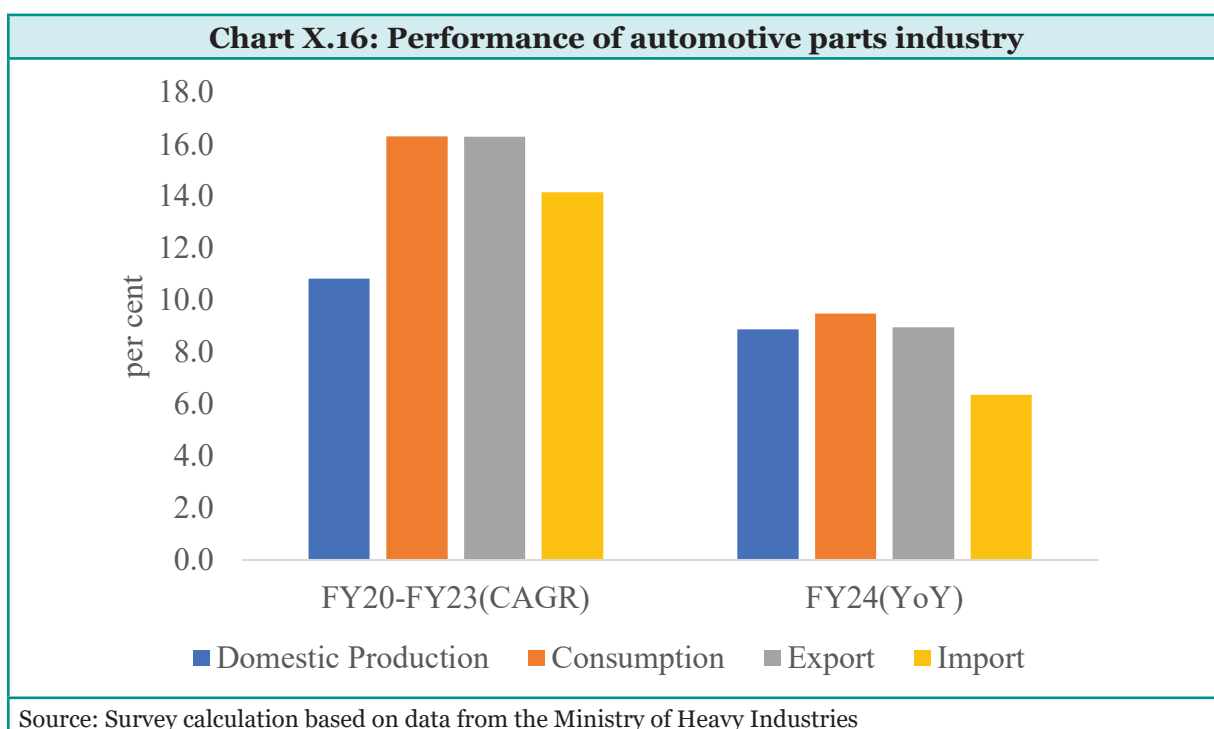
To bolster the electronics manufacturing ecosystem in the country, the Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS) was introduced in 2020. The scheme offers a substantial financial incentive of 25 per cent on capital expenditure for a specific list of electronic goods that form the downstream value chain of electronic products. As of March 2024, a proposed investment of ₹12,638 Crore and committed incentives of ₹1758 Crore have been approved under the Scheme.

PLI 2.0 for IT Hardware	Electronics Manufacturing Clusters (EMC/EMC 2.0) Scheme
<ul style="list-style-type: none"> ➤ Notified in May 2023, the Scheme aims to broaden and deepen the manufacturing ecosystem by encouraging localisation of components and sub-assemblies tied to incremental sales and investment thresholds. ➤ The Scheme offers an average incentive of around 5 per cent on net incremental sales of eligible goods manufactured in India for six years. ➤ Progress of the Scheme: Total production: ₹3367.63 Crore Additional investment: ₹269.44 Crore Additional direct jobs: 3493 	<ul style="list-style-type: none"> ➤ The EMC Scheme, launched in 2012, supports EMC projects and Common Facility Centres to attract electronics manufacturing in India. ➤ The EMC 2.0 Scheme, notified in April 2020, extends financial assistance for the above projects, with applications open until March 2024 and disbursement until March 2028. ➤ Progress of Scheme: ₹184.91 Crore has been released under the scheme and is expected to attract ₹40,429 Crore in investment and generate employment for 5.02 Lakh.

Source: Ministry of Electronics and Information Technology (MEITY)

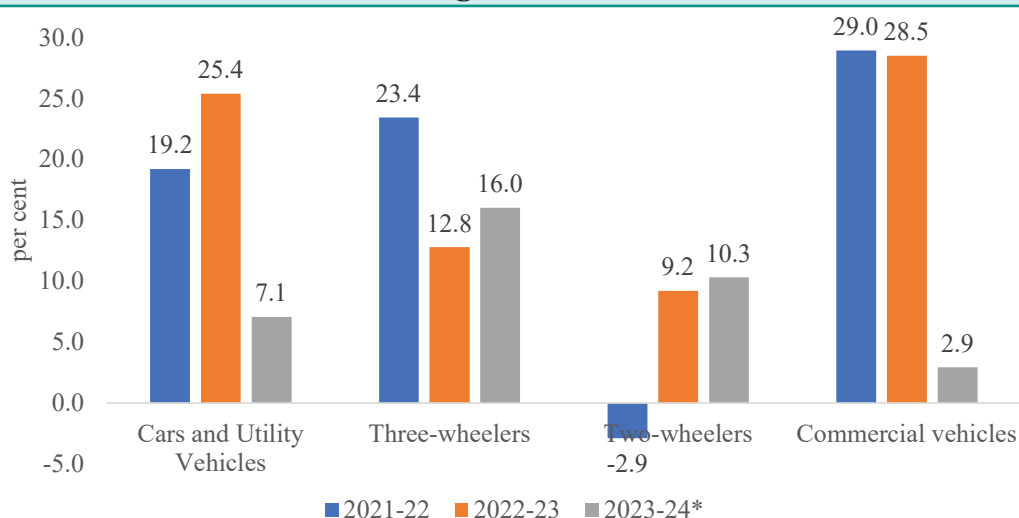
Automotive industry

10.25. The Indian automobile industry includes major global auto manufacturers across different categories, as well as a vibrant auto component industry that produces various auto parts, body and chassis. The growth in the value of domestic production and consumption of automotive parts moderated during FY20 to FY23, compared to the previous five years. The production of auto components depends on the dynamics of the domestic and export markets. The auto components sector closely follows the trends in automobile production. As seen below, the pandemic affected the automobile sector considerably, which weakened the demand for automotive parts and, hence, their pace of expansion.



10.26. In the first half of the last decade, passenger vehicles, such as cars and utility vehicles, experienced significant growth. However, the pandemic had a substantial impact on all segments of the automotive industry. While passenger vehicles quickly recovered, the recovery period for two-wheelers, three-wheelers, and commercial vehicles is longer. Chart X.17 indicates that cars and utility vehicles (UVs), three wheelers, two wheelers and commercial vehicles are currently expanding as seen in the growth rates of recent years. In FY24, the country produced approximately 49 lakh passenger vehicles, 9.9 lakh three-wheelers, 214.7 lakh two-wheelers, and 10.7 lakh commercial vehicles.

Chart X.17: Annual growth (YoY) in the production of different categories of automobiles



Source: Survey calculation based on data from the Ministry of Heavy Industries

Box X.7: Policy Support for Automobiles and E-mobility

Under the PLI Scheme	For E-mobility	
	Battery Storage	Phase II of the FAME Scheme
<ul style="list-style-type: none"> • PLI Scheme for automobile and auto components has a budgetary outlay of ₹ 25,938 Crore from FY23 to FY27. • Sub-divided into champion OEM incentive scheme and component champion incentive scheme. • 85 applicants have been approved. • Attracted a proposed investment of ₹67,690 Crore, against which ₹14,043 Crore has been invested till end-March 2024. 	<ul style="list-style-type: none"> • National Programme on Advanced Chemistry Cell (ACC) Battery Storage was approved in May 2021 with a budgetary outlay of ₹ 18,100 Crore. • Envisages to enhance manufacturing capabilities of ACCs by setting up of Giga scale ACC and battery manufacturing facilities. • Aims to set up a cumulative ACC manufacturing capacity of 50 GWh for ACCs and a cumulative capacity of 5 GWh for Niche ACC Technologies. • The first round of the ACC PLI bidding concluded in March 2022, whereby a capacity of 30 GWh was allocated. 	<ul style="list-style-type: none"> • Approved with an outlay of Rs 11500 Crore for 5 years during FY20 to FY24. • Aims to generate demand for electric vehicles by supporting 7000 e-buses, 5 Lakh e-3 wheelers, 5 to FY5000 e4 wheeler passenger cars and 10 Lakh e-2 wheelers. The progress in e-vehicles is presented in table X.2. • The Scheme to Promote Manufacturing of Electric Passenger Cars in India (SPMEPCI) was approved in March 2024.

<ul style="list-style-type: none"> Applicants have proposed employment generation of 1.48 lakh, against which 28,884 of employment has been generated till 31/03/2024. 	<ul style="list-style-type: none"> Government released a Request for Proposal on 24th January 2024 for a total manufacturing capacity of 10 GWh. Bids were received for a cumulative capacity of 70 GWh. 	<ul style="list-style-type: none"> Electric Mobility Promotion Scheme 2024 (EMPS 2024) with an outlay of ₹500 Crore for a period of 4 months till July 2024. It aims to faster adoption of e2 wheelers and e3 wheelers, including registered e-rickshaws, e-carts, and L5.
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Table X.2: Number of vehicles incentivised under Phase II of the FAME Scheme (in '000)

Segment	2019-20	2020-21	2021-22	2022-23	2023-24	Total
e-2W	11.4	29.3	116.6	208.8	804.2	1170.2
e-3W	3.4	9.1	21.8	19.8	76.2	130.3
e-4W	0.7	0.7	0.7	2.1	12.4	16.6
e-bus	0.0	0.4	0.7	1.6	1.9	4.6
Total	15.6	39.6	139.8	232.2	894.6	1321.8

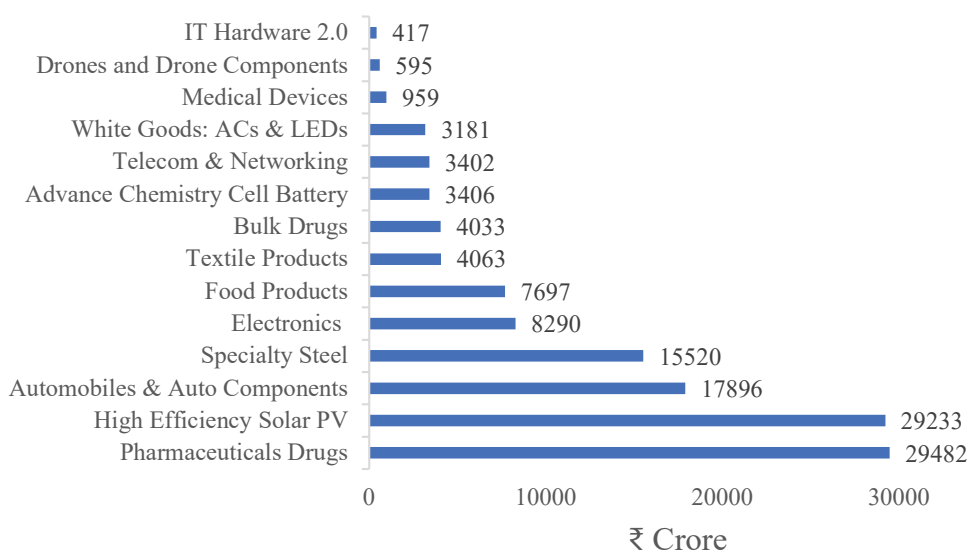
Source: Survey calculation based on data from the Ministry of Heavy Industries

CROSS-CUTTING THEMES

Production Linked Incentive (PLI) Scheme

10.27. Keeping in view India's vision of becoming 'Aatmanirbhar', Production Linked Incentive (PLI) Schemes for 14 key sectors were announced with an outlay of ₹1.97 Lakh Crore to enhance India's manufacturing capabilities and exports. Over ₹1.28 Lakh Crore of investment was reported until May 2024, which has led to production/sales of ₹10.8 Lakh Crore and employment generation (direct & indirect) of over 8.5 Lakh. Export boosted by ₹4 Lakh Crore, with significant contributions from sectors such as large-scale electronics manufacturing, pharmaceuticals, food processing, and telecom & networking products.

10.28. PLI Scheme for White Goods (ACs and LED Lights) with a total outlay of ₹6,238 Crore was approved by the Government. As of May, 2024 the cumulative investment achieved by white goods(AC, LEDs) under the PLI scheme was ₹3181 crore which generated cumulative sales of ₹13320 crore. The PLI scheme for the remaining sector is covered under the respective sector sections.

Chart X.18: Actual sector-wise investment under the PLI scheme

Source: DPIIT

Micro, Small & Medium Enterprises

10.29. As per the latest information available from the Ministry of Statistics & Programme Implementation, the share of MSMEs in all-India manufacturing output during the year FY22 was 35.4 per cent. Data Dissemination Portal of Directorate General of Commercial Intelligence and Statistics (DGCIS) states that the share of export of MSME-specified products in all-India exports in 2023-24 was 45.7 per cent.

10.30. According to the Annual Survey of Unincorporated Sector Enterprises for 2021-22 and 2022-23,²⁰ the number of unincorporated enterprises in India increased with 5.9 per cent during the period of October 2022-September 2023 in comparison to April, 2021-March 2022. During the same period, Gross Value Added (GVA) per worker increased from ₹1,38,207 to ₹1,41,769 and Gross Value of Output (GVO) per establishment increased from ₹3,98,304 to ₹4,63,389. This shows an increased productivity with more efficient use of resources including labour, which is critical for sustained economic growth and competitiveness.

10.31. The Udyam Registration portal, launched in July 2020, has been instrumental in formalising MSMEs by providing a simple, online, and free registration process based on self-declaration. As of 05 July 2024, 4.69 Crore MSMEs are registered on the Udyam Registration portal, including Informal micro enterprises registered on the Udyam Assist Platform. Udyam registration helps MSMEs avail themselves of the benefits of the Ministry of MSME schemes. Udyam-registered MSMEs are also eligible for priority sector lending from banks. Udyam Portal has API linkage with 37 other portals, and through this, data sharing is facilitated. This has benefited the MSME sector considerably.

10.32. The Union Budget 2023-24 allocated ₹9,000 Crore to the Credit Guarantee Fund Trust

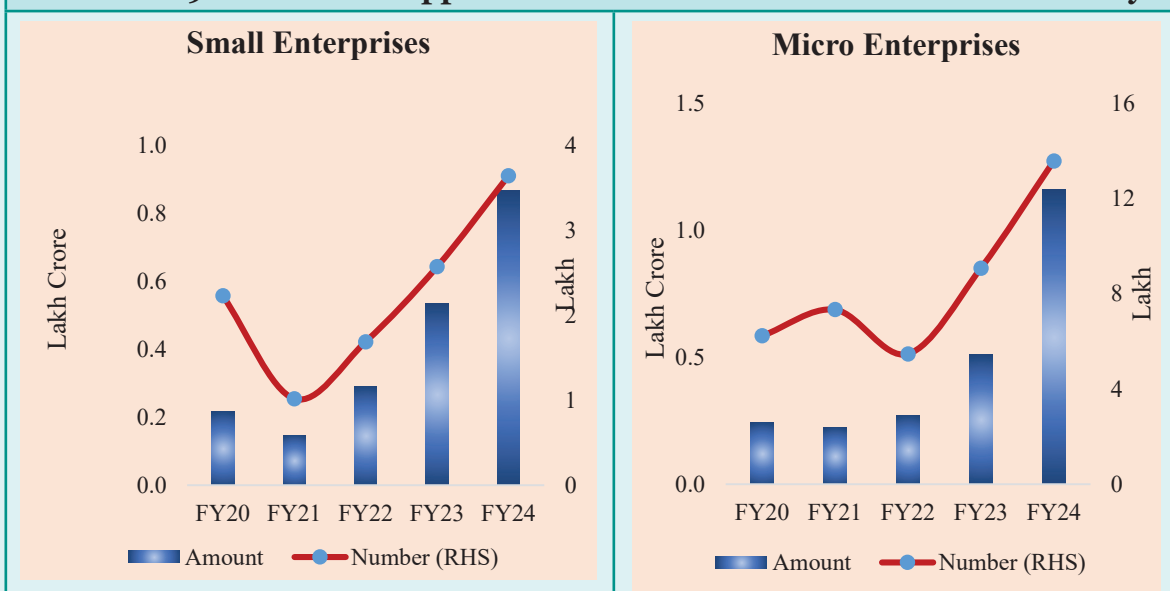
²⁰ Fact sheet of Annual Survey of Unincorporated Sector Enterprises (2021-22, 2022-23) link: https://www.mospi.gov.in/sites/default/files/publication_reports/Factsheet_with_infograph_A4.pdf

for Micro and Small Enterprises (CGTMSE), aiming to enable an additional ₹2 Lakh Crore in credit with reduced costs. Significant growth was witnessed from FY20 to FY24 in the amount and number of guarantees for micro and small enterprises (Chart X.19).

Box X.8: MSME credit schemes

Prime Minister’s Employment Generation Programme	The Credit Guarantee Scheme (CGS)
<ul style="list-style-type: none"> During FY23, facilitated assistance to 85,167 micro-units with a margin money subsidy of ₹2,722.17 Crore, generating employment for around 6.81 Lakh people. In FY24, this support was extended to 89,118 micro-units with a margin money subsidy of ₹3,093.87 Crore, creating employment opportunities for around 7.13 Lakh. 	<ul style="list-style-type: none"> Administered by the CGTMSE Aim to alleviate the credit constraints faced by MSMEs by offering collateral-free loans of up to ₹5 Crore, with a guaranteed coverage of up to 85 per cent. The scheme, since its inception, has approved 91.76 Lakh guarantees amounting to ₹6.78 Lakh Crore. In FY24 alone, 17.24 Lakh guarantees worth ₹2.03 Lakh Crore were approved.

Chart X.19: Guarantees approved under CGTMSE increased considerably



Source: Ministry of MSME

10.33. Challenges and Opportunities: MSMEs face challenges, including issues with formalisation and inclusion, limited access to finance, markets, technology, and digitalisation, infrastructural bottlenecks, and skilling. To address these challenges, the Government has implemented initiatives and platforms aimed at supporting formalisation, ease of registration and grievance redressal, like the Samadhaan Portal, Sambandh Portal, and Champions Portal, which aid in delayed payment issues, procurement monitoring, and speedy resolution

of grievances. The Global Value Chain Development Report (2019) highlights that although SMEs are underrepresented in global value chains, the digital economy offers them significant new opportunities. This is evident in India's MSME sector, where nearly 70 per cent of total e-commerce sales in 2020-21 were from MSMEs, reflecting a year-on-year growth rate of 60-70 per cent²¹. Further, research shows that reimagining the level of regulations on the usage of factory space, like those relating to setbacks, will likely augment the manufacturing capacity, especially of the micro and small firms (Box X.9).

Box X.9: Reimagining building regulations to augment manufacturing capacity

Existing industrial building regulations limit factory land usage, reducing land utility and resulting in unquantified costs. The report titled *State of Regulation: Building Standards Reforms for Jobs and Growth*²² illustrates how land remains unutilised while complying with the four building regulations relating to ground coverage, setbacks, parking and floor area ratio.

1. **Land lost due to Ground Coverage:** The report shows that under the ground coverage regulations on factory plots, intended to control density and promote groundwater recharge, a factory building can cover no more than 40–60 per cent of the plot, depending on the State in which the factory conducts its operations. In comparison, in Hong Kong, a factory will not lose any proportion of the plot; in the Philippines, only 30 per cent of the plot.
2. **Land lost due to Setbacks:** State-level regulations limit the horizontal building expansion to minimise fire risk and ensure ventilation and light. The aforementioned report shows that regulations, however, do not account for modernisation in technology and manufacturing processes. For example, the use of fire-resistant materials and automatic fire-fighting equipment can effectively reduce hazards without locking up productive land. Moreover, natural light and ventilation may be counterproductive in certain industries like chemicals, pharmaceuticals, and electronics. Setbacks are particularly challenging for micro and small factories in certain States. The factories end up losing even 60–90 per cent of their land in certain States just to comply with these regulations. A mega factory in an Indian State loses ~2X more land to setbacks than one in the Philippines and ~5X more than the one in Singapore.
3. **Land lost due to Parking Regulations:** State governments enforce regulations mandating off-street parking to ease street congestion. However, research suggests that these mandates may actually contribute to more congestion. Parking requirements do not align with actual demand, leading factories to lose a significant amount of land. The report finds that the factories across India lose ~12–70 per cent of their land to

²¹ MSMEs Go Digital: Leveraging Technology to Sustain during the Covid-19 Crisis, ICRIER, 2022, Page 10 (MSMEs_Go_Digital.pdf (icrier.org))

²² Bhuvana, A., Kaur, S., and Roy, S., 2023. "State of Regulation: Building standards reforms for jobs and growth". Prosperiti, December

meet parking minimums. A factory in India may have to provide at least double the number of car parking spaces compared to Hong Kong, the Philippines, or Singapore.

4. **Land lost due to Floor Ratio:** States regulate the floor area ratio (FAR) to restrict vertical expansion on designated land parcels, aiming to manage density, alleviate traffic congestion, and facilitate the provision of essential utilities such as water and electricity. However, such regulations may inadvertently contribute to urban sprawl, thereby exacerbating road congestion and escalating utility provisioning expenses. On average, factories across states are only allowed to create floor space up to 1.3 times the plot size. With a 1000 sqm plot, an office building in Mumbai can be built up to 5000 sqm, whereas in Japan, it can go up to 13,000 sqm and 15,000 sqm in Singapore and Hong Kong.

There is a need to examine and rationalise building regulations to augment manufacturing capacity. Better utilisation of land will bring the fixed cost of production per unit, thus incentivising the entrepreneur to hire more workers as well. Apart from studying international best practices, inter-state comparisons can help states identify best practices and adopt appropriate policies.

Box X.10: ODOP: Crafting regional pride and economic empowerment

In 2018, the Government launched the One District One Product (ODOP) initiative to identify, brand, and promote the unique strengths of each district through a single, iconic product produced in that district to bridge the regional economic divide and nurture self-reliance across India's diverse districts. Districts that have more than one product identified have been categorised as secondary or tertiary products. These products cover various sectors, including agriculture, manufacturing, handloom and textiles, handicrafts, food processing, marine, and services. The initiative has identified 1102 products from 761 districts across the country till now.

To give an impetus to the ODOP initiative, the Union Budget of FY24 announced that States would be encouraged to set up a “Unity Mall” in their state capital or most prominent tourism centre or the financial capital for the promotion and sale of their own ODOPs, GI products and other handicraft products, and for providing space for such products of all other states. These “PM-Ekta Malls” aim to link the artisans of ODOP and consumers. These malls are creating a vibrant marketplace for the nation’s unique products, aiming at both domestic and foreign markets.

The Government has been undertaking many initiatives to promote ODOP and showcase success stories. ‘ODOP Sampark’ workshops were conducted in 15 States to facilitate collaboration between the Centre and local sellers and revive indigenous industries. ODOP showcased India to the world at the various G20 events organised across the country during India’s G20 Presidency, where the artisans, sellers and weavers got much visibility on the global stage during the events.²³

23 <https://pib.gov.in/PressReleasePage.aspx?PRID=2000801>

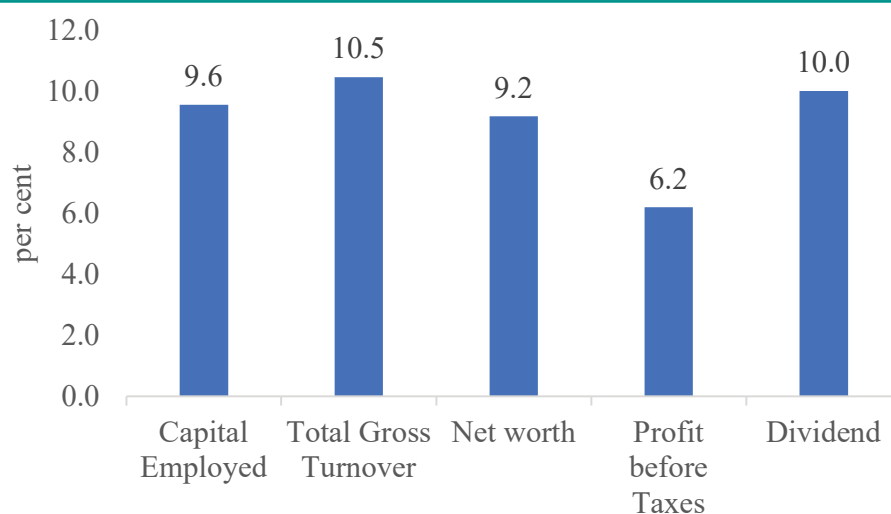
Some of the success stories of ODOP

- Pack sheds and irrigation arteries, funded by various Government initiatives, have resulted in a 20 per cent surge in the production of Shopian apples in Kashmir.
- NGOs, local administration, and over 700 farmers in the Uttarkashi district of Uttarakhand have been empowered with organic farming skills through 15 tailored training sessions. Equipped with vital tools for 1000+ beneficiaries, red rice production in this district increased considerably.
- Nearly 1,50,000 tribal families in Araku Valley, Andhra Pradesh, have boosted coffee output by 20 per cent, fuelled by Girijan Co-Operative Corporation loans.
- Over 5,000 trained workers in the Kandhamal district of Odisha have joined 1,300 farmers in garnering domestic and international turmeric markets. Government procurement of the spice has also increased by about 70 per cent. Speedy testing labs, financial aid in the form of subsidies, loans, and support for formalisation in the Bhatinda district of Punjab have led to a 30 per cent rise in honey production.²⁴

Central Public Sector Enterprises (CPSEs)

10.34. As of March 31, 2023, 254 CPSEs were operational. Around 66 per cent of the CPSEs operated in the service sector; the rest in manufacturing, processing & generation and mining & exploration. CPSEs achieved stronger financial parameters FY23 and FY24. The total Market Capitalisation (M-cap) of 63 CPSEs traded on stock exchanges of India was ₹16.69 Lakh Crore as of March 31, 2023, as against ₹15.46 Lakh Crore as of March 31, 2022, reflecting an increase of 7.95 per cent²⁵. The overall net profit of operating CPSEs in FY23 was ₹2.12 Lakh Crore. The major financial parameters of CPSEs are presented in the Charts below.

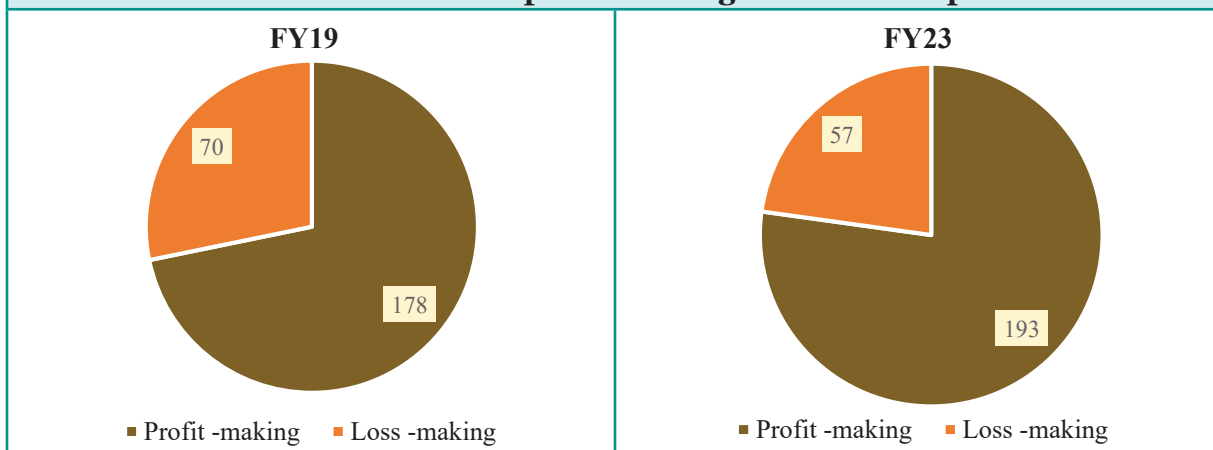
Chart X.20: Improvement in Performance of CPSEs between FY19 and FY23 (CAGR)



Source: PE Survey Report, Department of Public Enterprises

²⁴ PIB press release of Ministry of Commerce and Industry dated 2 February 2024, link available at: <https://pib.gov.in/FeaturesDeatils.aspx?NoteId=151807&ModuleId%20=%202>

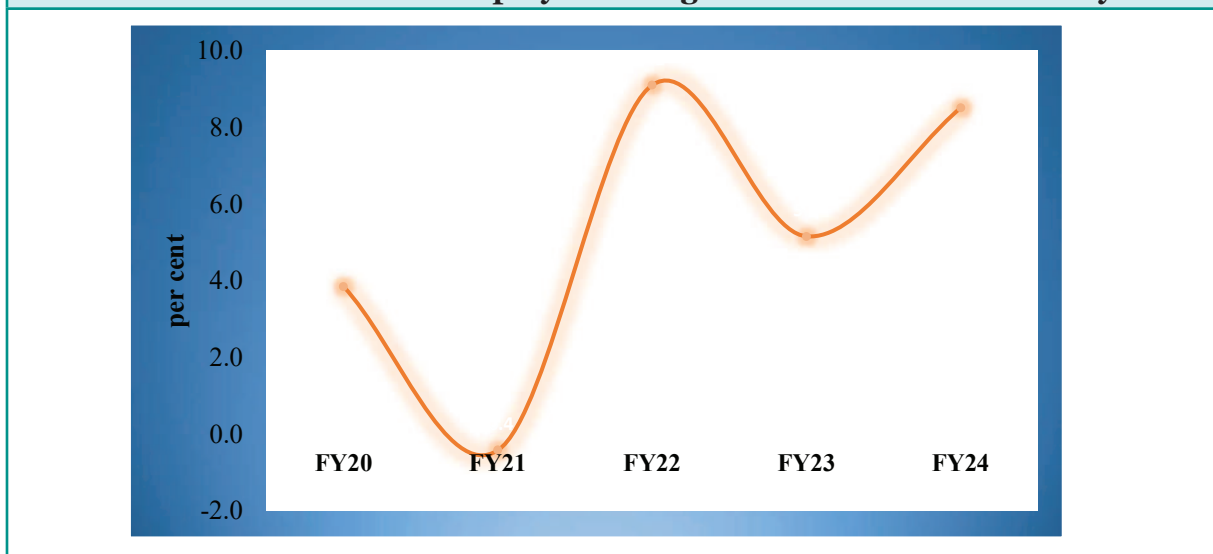
²⁵ https://dpe.gov.in/sites/default/files/PES%202022-23_E.pdf

Chart X.21: Number of profit-making CPSEs has improved

Source: PE Survey Report, Department of Public Enterprises

Industrial Credit

10.35. Industrial credit growth depends on a host of factors, including the cyclicity of economic activity, relativity in the availability and cost of bank funds and other market options, the position of own resources of industrial enterprises and the banking system's own risk appetite. Recovering from the pandemic-driven moderation in FY21, industrial credit picked up strongly in the next year. In FY23, credit growth was mainly driven by large industries; however, this growth was hampered by a decrease in credit to certain sectors.

Chart X.22: Growth in deployment of gross bank credit to industry

Source: Database on Indian Economy, Industry-wise deployment of gross bank credit, RBI

Note 1: With effect from March 2019, sectoral credit data are based on a revised format, due to which values and growth rates of some of the existing components published earlier have undergone changes.

Note 2: Credit data are adjusted for past reporting errors by select SCBs for March 2022.

Note 3: Data for 2023-24 include the impact of the merger of a non-bank with a bank

Table X.3: Industry-wise Growth (YoY) in credit deployment (in per cent)

Sector	(Minimum)	(Maximum)
	CAGR from March 2020 to March 2024	Growth (YoY) in Mar-24
Mining and quarrying (incl. Coal)	4.5	-10.1
Food processing	9.7	14.9
Beverage and tobacco	14.6	30.9
Textiles	7.3	11.2
Leather and leather products	4.7	5.4
Wood and wood products	15.0	12.4
Paper and paper products	9.2	4.9
Petroleum, coal products and nuclear fuels	13.4	-11.4
Chemicals and chemical products	5.8	11.3
Rubber, plastic and their products	14.5	7.6
Glass and glassware	15.4	26.3
Cement and cement products	-0.5	2.9
Basic metal and metal product	3.5	12.2
All engineering	4.8	10.5
Vehicles, parts and transport equipment	5.9	11.4
Gems and jewellery	6.2	8.0
Construction	1.1	6.9
Infrastructure	4.7	6.6
Other industries	3.7	18.4
Total Industries	5.5	8.5

Source: Database on Indian Economy, Industry-wise deployment of gross bank credit, RBI

Industrial R&D and Innovation

10.36. As the public sector presence in core manufacturing is limited to only about 7 per cent, its share in industrial R&D is also limited. An initial review of the Global Innovation Index (GII) 2023 indicator shows that the U.S. is leading in corporate R&D, followed by China and Germany. Middle-income countries like India, Turkey, Brazil and Indonesia also experienced an increase in their R&D²⁶. As industrial R&D in India is highly concentrated in a few sectors, the top five sectors account for more than 70 per cent.

26 Global Innovation Index (2023) World Intellectual Property Organisation (WIPO)

Table X.4: Industrial R&D Facts in India: FY19 to FY21 average		Chart X.23: Share of sub-sectors in industrial R&D spending in India: FY19 to FY21 (in per cent)	
Industrial R&D spending in India (₹ Crore)	44720	Drugs & Pharma	32.3
Industrial R&D as per cent of manufacturing GVA	1.61	Textiles	13.5
Industrial R&D by private sector as per cent of private sector manufacturing GVA	1.53	Information Technology	9.5
Industrial R&D by public sector as per cent of public sector manufacturing GVA	2.67	Transportation	8.7
Number of industrial R&D units: private sector	1866	Defence Industries	7.1
Number of industrial R&D units: public sector	94	Bio-technology	3.5
		Fuels	3.4
		Chemicals	3.4
		Electricals & Electronics	3.4
		Agricultural Machinery	3.0
		Industrial Equipment	2.3
		Others	9.8

Source: Research and Development Statistics, Department of Science & Technology

10.37. Building a holistic innovation ecosystem is crucial for inclusive, sustainable, and innovation-driven economies. The innovation system emphasises the systemic interactions between stakeholders and institutions impacting innovation processes.²⁷ This incorporates insights from informal and grassroots innovation, highlighting their potential to meet niche demands. The most significant initiatives adopted to foster innovation and startup culture in India include:

Box X.11: Efforts to promote startups and innovation culture in India																				
Patents and research	Start-ups	Innovation																		
<ul style="list-style-type: none"> Patent Rules, 2024 was notified, simplifying patent acquisition and management. The number of granted patents increased seventeen-fold from 5978 in 2014-15 to 103057 in 2023-24. Registered designs rose from 7147 in 2014-15 to 30672 in 2023-24. 	<ul style="list-style-type: none"> From around 300 start-ups in 2016, the number of DPIIT-recognised start-ups increased to more than 1.25 Lakh by end-March 2024. More than 45 per cent of the recognised start-ups are emerging out of Tier 2/3 cities. More than 47 per cent of the recognised start-ups have at least one woman director. Start-ups filed more than 12,000 patent applications from 2016 to March 2024. 	<table border="1"> <caption>DPIIT-Recognised Start-ups in India (2015-2023)</caption> <thead> <tr> <th>Year</th> <th>Number of Start-ups</th> </tr> </thead> <tbody> <tr> <td>2015</td> <td>81</td> </tr> <tr> <td>2016</td> <td>66</td> </tr> <tr> <td>2017</td> <td>60</td> </tr> <tr> <td>2018</td> <td>57</td> </tr> <tr> <td>2019</td> <td>52</td> </tr> <tr> <td>2020</td> <td>48</td> </tr> <tr> <td>2021</td> <td>46</td> </tr> <tr> <td>2022 & 2023</td> <td>40</td> </tr> </tbody> </table>	Year	Number of Start-ups	2015	81	2016	66	2017	60	2018	57	2019	52	2020	48	2021	46	2022 & 2023	40
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2022 & 2023	40																			

27 Lundvall, B. A., Joseph, K. J., Chaminade, C., Vang, J. (2009). "Handbook of innovation system and developing countries" Cheltenham: Edward Elgard

<ul style="list-style-type: none"> • Anusandhan National Research Foundation (ANRF) bill 2023 was passed. Estimated cost of ₹ 50,000 Crore during 2023-28. • ANRF will act as an apex body to provide high-level strategic direction for scientific research. It will forge collaborations among the industry, academia, governments, and research bodies and facilitate interface. 	<ul style="list-style-type: none"> • There are over 13,000 DPIIT-recognized start-ups in artificial intelligence, the Internet of things, robotics, and nanotechnology by the end of FY24. • Under Fund of Funds for Start-ups, more than ₹10,500 Crore has been committed to more than 135 Alternative Investment Funds, which invested more than ₹18,000 Crore in start-ups by the end of FY24. • The Bharat Startup Knowledge Access Registry aims to bring together diverse stakeholders in the startup ecosystem. 	<ul style="list-style-type: none"> • Under the Global Innovation Index (GII), India's rank improved consistently. • India ranks first in the lower middle-income countries and among central and southern Asian economies. • India holds the top rank globally in the domestic market scale indicator.
Source: DPIIT		

CONCLUSION AND OUTLOOK

10.38. The foregoing analysis gives an indication of the emerging trends in the Indian industrial landscape. First, over the last decade, there has been a significant realignment of output shares among industrial segments. Sectors like chemicals, wood products and furniture, pharmaceuticals, transport equipment, steel and machinery and equipment have gained in strength. Some of these are important industrial intermediates and consumer goods, while the others cater to requirements of capital formation. On the other hand, sectors like textiles, food products, beverages and tobacco and petroleum products and leather lost their relative positions.

10.39. Secondly, the export-import balance of different industrial segments has vastly varied over the last few years. Consistently, major net exporters include industries such as steel, pharmaceuticals, and automobiles. On the other hand, import dependency in key sectors like coal, capital goods and chemicals continue.

10.40. Thirdly, the medium-term outlook on the demand for capital goods and key construction inputs like steel and cement is likely to be positive, as there are clear signs that capital formation in the private sector is gathering momentum. Global uncertainties raise question mark on export demand and the domestic cost of production due to dependence on critical imported inputs like coal, petroleum, steel and machinery.

10.41. Government has taken many recent initiatives to improve ease of doing business, reduce compliance burden and to alleviate logistic and infrastructural bottlenecks. The PLI schemes for key sectors have attracted significant investments, boosted production, sales and exports and generated jobs, particularly in the case of white goods. Where governments across the country can help is in reviewing, amending, relaxing and annulling regulations that are messy, stifling, counterproductive and raise the cost of operations for businesses without commensurate public benefits. Decisions that are best left to the entrepreneurs are mandated by law, leading to fear of prosecution. The path to further industrialisation in India is paved with deregulation.

10.42. Two common requirements across industries relate to incentivising R&D and innovation and improving the skill levels of the workforce. With respect to both, industry must take the lead. Commitment to R&D must be in the DNA of the industry, independent of any fiscal incentive, since it is about global competitiveness and profitability. With active collaboration between industry and academia and emphasis on vocational education in curriculums, India can meet the skill shortage more effectively than hitherto.

10.43. Sectors with widely scattered production units like textiles, and the MSME sector in general, seek solutions to constraints of supply chain management, market access and formalisation. There have been many focused policy initiatives addressing these issues, as mentioned in the section on MSME; further action along the following lines may be considered at the levels of the appropriate governments in a cooperative federalism mode:

- (a) Ensuring support systems to develop MSME projects and their bankability and adequate financing arrangements for such projects
- (b) targeted facilitation and incentivisation of employment-intensive MSME segments
- (c) progressively easing the compliance requirements with a single-window mechanism for clearances, digitisation of processes and equipping MSMEs to handle these processes with ease
- (d) providing grassroots-level facilitation to ensure market access to MSME products
- (e) government-industry-academia collaboration to upskill the workforce.

10.44. Upgrading the statistics on industry on the following lines will aid policymaking:

- (a) Updated index of industrial production, incorporating the vast changes that have occurred in India's manufacturing landscape. State level variants of such indices will help understanding the emerging geographical patterns
- (b) Regular indicators of the dynamics of production and employment in MSMEs
- (c) Information on industry-wise gross disbursement of bank credit (as opposed to the data on outstanding credit currently available), industry-wise monthly gross financial flows through domestic and external equity and debt routes as well as other financing sources.

SERVICES: FUELLING GROWTH OPPORTUNITIES

Through the vicissitudes of the last three decades, the services sector stood as the bulwark of India's economic growth. Its post-pandemic dynamics, particularly the trends and patterns that emerged and solidified during FY24, indicate an ongoing transformation in domestic service delivery systems and their demands. Aided by the focus on policy and procedural reforms, physical infrastructure and logistics, all significant business, personal, financial and infrastructure-based services have emerged strongly from the pandemic. However, the transformation lies in the fast-paced shift towards digital services like online payments, e-commerce, and entertainment platforms, as well as the increase in the demand for high-tech services as inputs in other productive activities. India's young and tech-savvy population offers an opportunity to enhance the country's vocational and educational ecosystem further. This will equip the labour force with the required digital and high-tech skills in a time-bound manner, helping India reap the full dividends of these opportunities.

INTRODUCTION

11.1 India's services sector encompasses a wide array of economic activities, which can be broadly classified into two categories: contact-intensive and non-contact-intensive services. The former includes trade, hospitality, transport, real estate, social, community and personal services. The latter comprises financial, information technology, professional, communication, broadcasting, and storage services. The sector also incorporates public administration and defence services.

11.2 The services sector continues to be a significant contributor to India's growth, accounting for about 55 per cent of the total size of the economy in FY24. Several demand and supply side factors determine the performance of the services sector. The significant domestic demand for services such as education, healthcare, finance, tourism, hospitality, and entertainment is underpinned by a large and young population. Rapid urbanisation supports transportation, housing, sanitation, and utility services. The expansion of e-commerce platforms has generated heightened requirements for logistics, digital payments, and related services. Information technology and business services will likely retain their prominent international presence in the medium term. However, studies suggest that the application of Artificial Intelligence (AI) is likely to restrain the growth opportunities for business services progressively and, therefore, poses a challenge to long-term sustainability and job creation. Thus, focusing on human capital

to take advantage of the agglomeration effects of large, well-functioning cities is critical for the growth of services, especially those with global market potential.¹

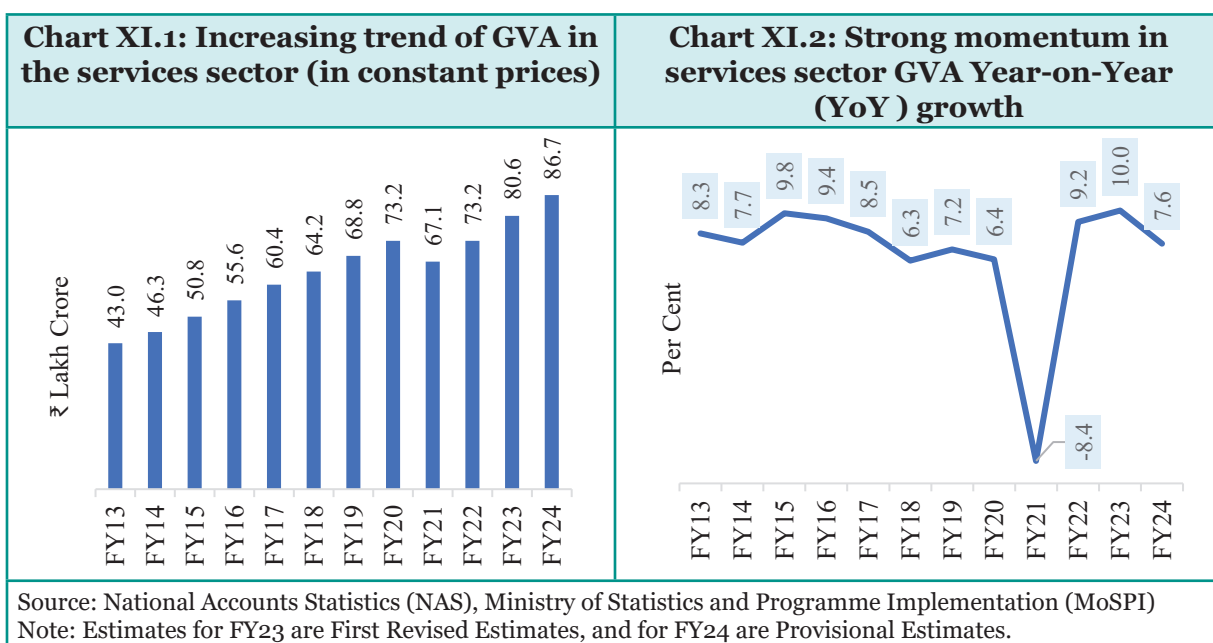
11.3 The Government has played a crucial role in fostering the growth and competitiveness of India's services sector by creating an enabling environment, promoting investment, enhancing skills, and facilitating market access. For instance, the Digital India campaign has fostered growth in digital services, export promotion schemes have encouraged services exports, infrastructure development has boosted logistics, tourism, and hospitality industry, and skill development initiatives have provided increased opportunities for the workforce. Furthermore, targeted efforts in healthcare and tourism have enhanced accessibility and development, ensuring a promising future for India's services sector.

11.4 The remaining sections of the chapter are organised with the emerging services landscape in the country as outlined above in view. The following section provides an overview of the performance of the services sectors in terms of domestic output and international trade activity, followed by a section on financial flows into the services sector. This is followed by a deep dive into the performance of various services sub-sectors and related policy initiatives. It may be noted that the developments in important social services like education and health are dealt with in Chapter 7 of this Survey. The last two sections highlight the challenges and opportunities in the services sector and concludes with a future outlook.

OVERVIEW OF THE SERVICES SECTOR PERFORMANCE

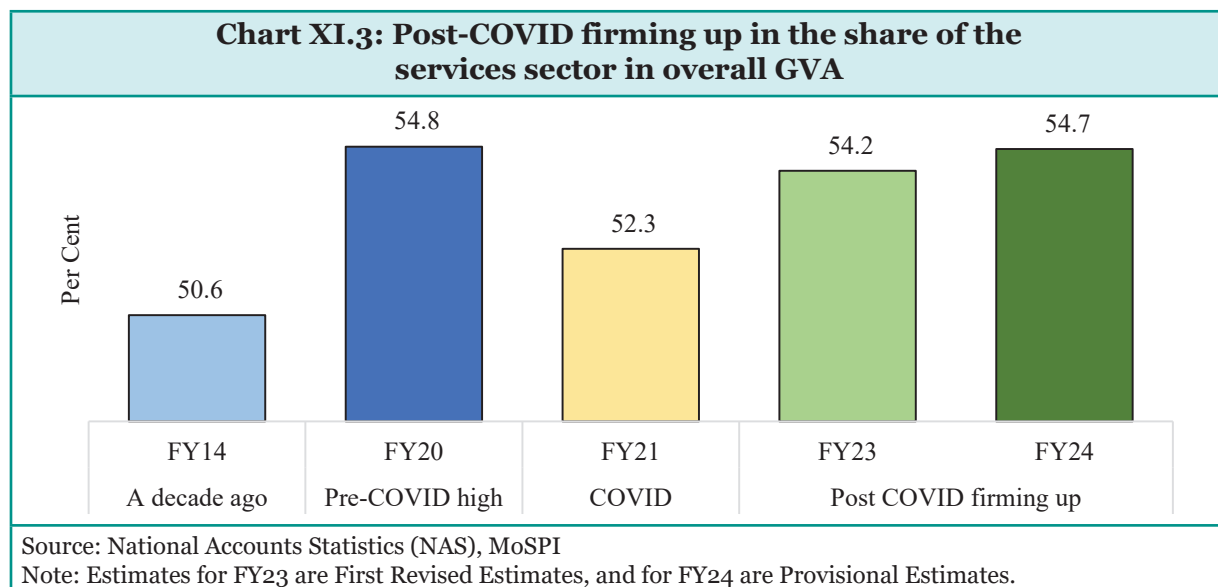
Gross Value Added (GVA) in the services sector

11.5 The services sector witnessed a real growth rate of more than 6 per cent in all the years in the last decade except in the pandemic-affected FY21. Globally, India's services exports constituted 4.4 per cent of the world's commercial services exports in 2022.

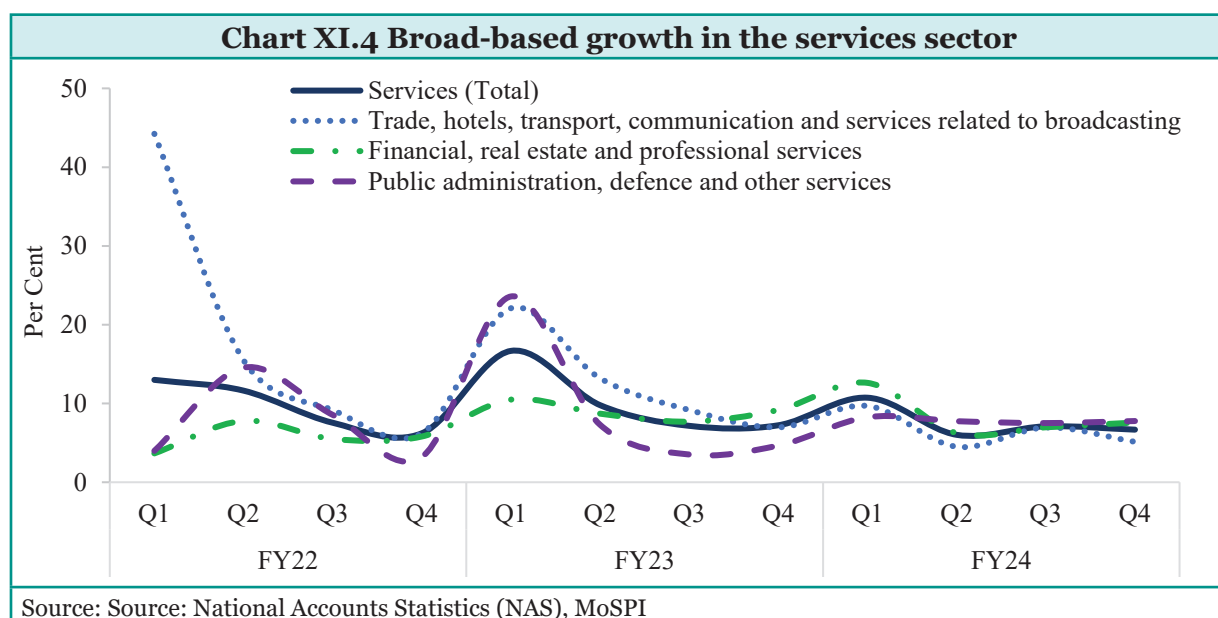


¹ The Economist (24 June 2024). Will services make the world rich? <https://www.economist.com/finance-and-economics/2024/06/24/will-services-make-the-world-rich>

11.6 The contribution of the services sector to the overall GVA has increased significantly in the last decade. The sector's share dropped in FY21 due to the pandemic-induced contraction. However, as shown in Chart XI.3, the sector's share has almost recovered to the pre-COVID levels.



11.7 For a decade before COVID, the services sector's real growth rate consistently exceeded the overall economic growth. However, in FY21, the services sector saw a sharper contraction of 8.4 per cent compared to a 4.1 per cent decline in overall GVA. Non-contact intensive services, primarily financial, information technology and professional services, experienced positive and steady growth due to fewer disruptions and increased demand for digital services. The contraction was concentrated in contact-intensive services due to lockdowns, restricted travel, and reduced demand for hospitality, entertainment, and personal services due to preventive measures. As the restrictions were lifted, these sectors rebounded, aided by the supportive policy environment. Hence, post-COVID, the services sector's growth outpaced overall GVA growth in FY23 and FY24, reclaiming its role in driving the economy's upward trajectory.

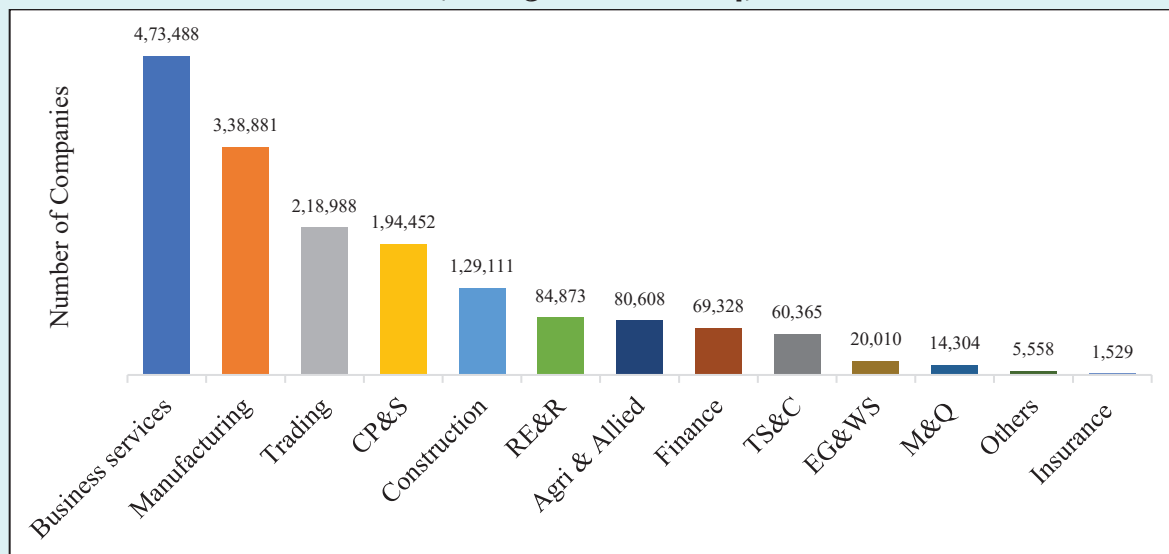


11.8 As per the Provisional Estimates, the services sector is estimated to have grown 7.6 per cent in FY24. Various high-frequency indicators support the services sector's growth story. Both GST collections and the issuance of e-way bills, reflecting wholesale and retail trade, demonstrated a double-digit growth. The gross GST collection reached ₹20.18 lakh crore² in FY24, marking 11.7 per cent increase from the previous year, underscoring robust domestic trading activity. Average daily electronic toll collection, total air passengers handled, and rail freight traffic registered a YoY growth of 18.9 per cent, 15 per cent and 5.3 per cent, respectively, in FY24, supporting the steady growth of transportation services. However, there is some catching up left to be achieved in the pre pandemic trend in the levels of trade, hotel and transport sector, as pointed out in Box I.1 of Chapter 1 of this Survey. Bank credit and deposits expanded YoY by 20.2 per cent and 12.9 per cent, respectively, as of March 2024, suggesting continued buoyancy in financial services. The residential property market also demonstrated a promising trend in 2023, with demand and new supply experiencing double-digit growth.³

Box XI.1: The services sector continues to command the highest share in the number of registered companies

A total number of 16,91,495 active companies exist in India as of 31 March 2024. The services sector has the highest number of active companies (65 per cent). Within the services sector, business services has the highest number of active companies (28 per cent), followed by trading (13 per cent) and community, personal and social services (11 per cent). In FY24 alone, 1,85,312 new companies were registered, out of which 71 per cent were services sector companies.⁴

Chart XI.5: Economic activity-wise distribution of active companies (as of 31 March 2024)



Source: Monthly Information Bulletin (March 2024), Ministry of Corporate Affairs

Note: CP&S - Community, Personal and Social Services, Agri & Allied - Agriculture and Allied Activities, RE&R - Real Estate and Renting, TS&C - Transport, Storage and Communications, EG&WS - Electricity, Gas and Water Supply Companies, M&Q - Mining and Quarrying. Services sector companies include Trading, Business services, CP&S, TS&C, RE&R, Finance, and Insurance.

² PIB release dated 01 April 2024, Ministry of Finance. <https://pib.gov.in/PressReleasePage.aspx?PRID=2016802>

³ PropTiger (04 January 2024). New home sales record 33% YoY growth in 2023: PropTiger.com report. <https://www.proptiger.com/guide/post/new-home-sales-record-33-yoy-growth-in-2023-proptiger-com-report>

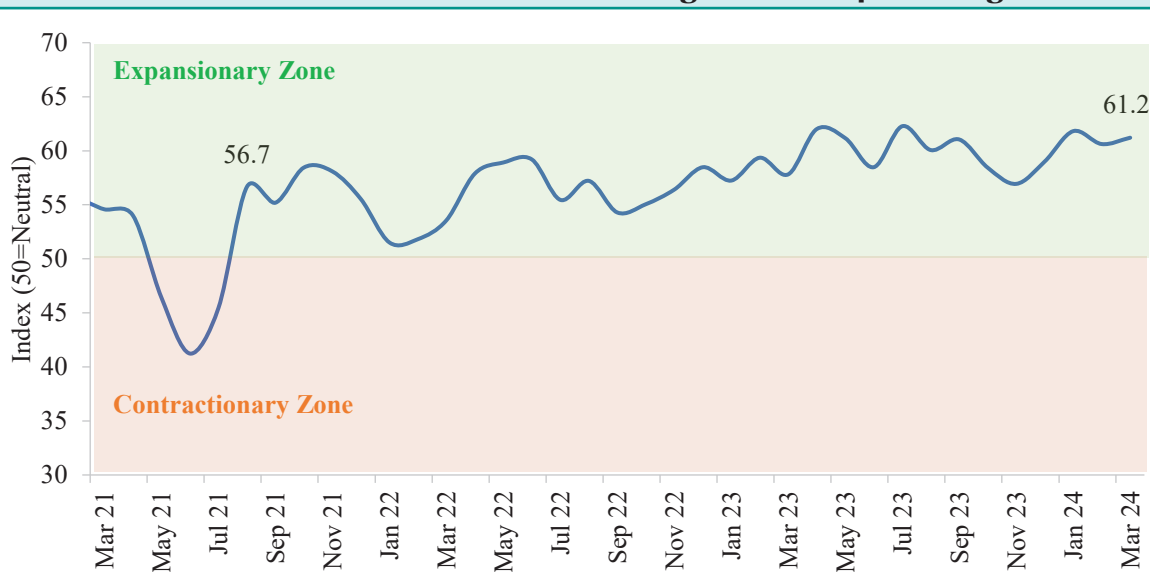
⁴ Ministry of Corporate Affairs. Monthly Information Bulletin (March 2024). <https://www.mca.gov.in/bin/dms/getdocument?mds=jRBDSS%252FnmHQx90z9wOfBCA%253D%253D&type=open>

A major factor driving interest in the services sector is the rising share of digitally delivered services, which have seen exponential growth in global exports. The rapid formalisation of the services sector, increased demand for digital, financial, and entertainment services, integration into the global supply chain, and the availability of skilled professionals for start-ups are driving the sector's growth in the economy.

Purchasing Managers' Index (PMI)- Services

11.9 Business activity in the services sector in India transcended the obstacles of the pandemic and other disruptions worldwide. The sector picked up significantly from April 2023 and remained resilient throughout the financial year. HSBC's India Services Purchasing Managers' Index (PMI)⁵ is a widely used high-frequency indicator that supports the overall services sector growth narrative. In March 2024, services PMI soared to 61.2, marking one of the sector's most significant sales and business activity expansions in nearly 14 years. This was primarily attributed to the latest upturn in business activity due to healthy demand conditions, efficiency gains and positive sales developments. PMI services averaged 60.3 in FY24 for the entire year compared to 57.3 in FY23.⁶ As can be seen from Chart XI.6, the services PMI has remained above 50 since August 2021, implying continuous expansion for the last 35 months. The sector has continued to expand amidst dynamic market conditions.

Chart XI.6: PMI Services touched new heights in FY24 amidst global flux



Source: Compiled from various monthly HSBC India Services PMI reports

Note: The index varies between 0 and 100, with a reading above 50 indicating an overall increase compared to the previous month and below 50, an overall decrease.

⁵ The services PMI include consumer (excluding retail), transport, information, communication, finance, insurance, real estate, and business services.

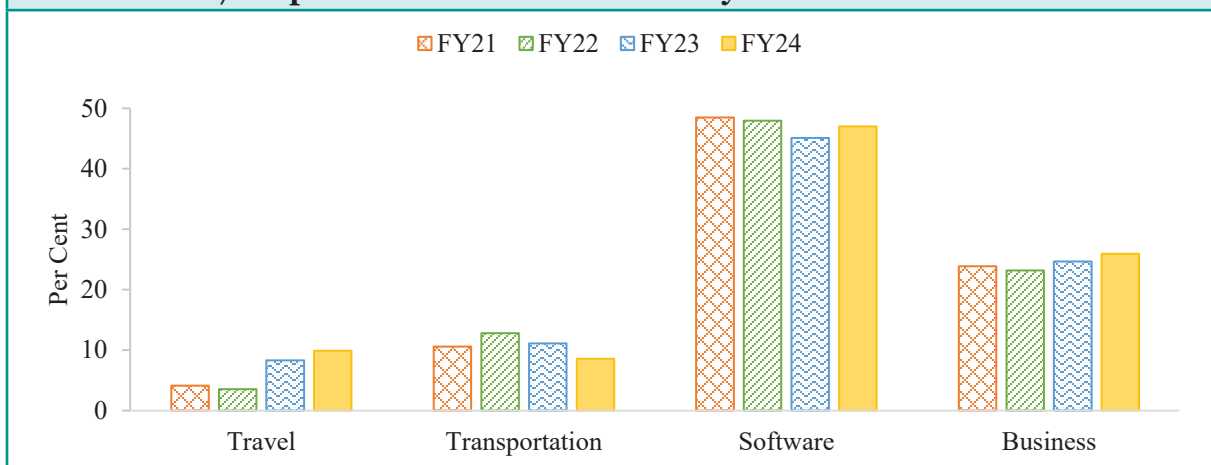
⁶ S&P Global (04 April 2024). HSBC India Services PMI. <https://www.pmi.spglobal.com/Public/Home/PressRelease/5964f1602e374900a1b109fcef7e2f3>

Trade in the services sector

11.10 Over the past three decades, India's export of services has seen remarkable growth, surpassing that of merchandise goods exports and constituting a significant portion of global exports. Post-pandemic, services exports have maintained a steady momentum and accounted for 44 per cent of India's total exports in FY24.

11.11 The weakening of global trade weighed down India's services exports during FY24, with a deceleration in growth to 4.8 per cent from 27.8 per cent a year ago. However, India ranked fifth⁷ in services exports, with other countries being the European Union (excluding intra-EU trade), the United States, the United Kingdom, and China. Computer services and business services exports accounted for about 73 per cent of India's services exports and witnessed a 9.6 per cent growth YoY in FY24. The export of travel services experienced a significant growth of 24.6 per cent YoY, benefitting from the continued recovery in tourism post-pandemic restrictions. On the contrary, transportation receipts declined by 19.1 per cent, primarily induced by a decrease in global freight rates, also reflected by a decline in the average Baltic Dry Index.⁸, which decreased by 3.9 per cent on a YoY basis during FY24.

Chart XI.7: Export contributions of four key sub-sectors within services



Source: RBI Handbook of Statistics on the Indian Economy (Table No.196 - India's Overall Balance of Payments- Quarterly- US Dollars)

Note: Other services not presented in the chart include- Insurance, Government not included elsewhere (G.n.i.e), Miscellaneous, financial and communication services.

11.12 Recently, the growth in the 'other business services' segment has been primarily driven by sectors such as business and management consultancy, public relations, engineering services, advertising, trade fair services and other technical services, including scientific and space services. India's growing reputation as the preferred destination for Global Capability

⁷ World Trade Organization. (2023). World Trade Statistical Review 2023 (Page 63). https://www.wto.org/english/res_e/booksp_e/wtsr_2023_e.pdf

⁸ Baltic Dry Index (BDI) is an index that tracks the price of transporting dry bulk cargo like cement, coal, iron ore, and grain on bulk freighters. As many of these commodities are raw materials that go into the production of finished goods, the BDI is often considered an indicator of economic growth and production. The index is maintained by the London-based Baltic Exchange.

Centres (GCCs) by multinational corporations seeking efficiency gains and reduced business costs has significantly boosted software and business services exports. Over the years, the share of travel and business services has increased while transportation has marginally fallen. Furthermore, the pandemic has catalysed a structural shift in global demand towards digitally delivered services. Consequently, India's share in digitally delivered services exports globally increased to 6.0 per cent in 2023 from 4.4 per cent in 2019.⁹

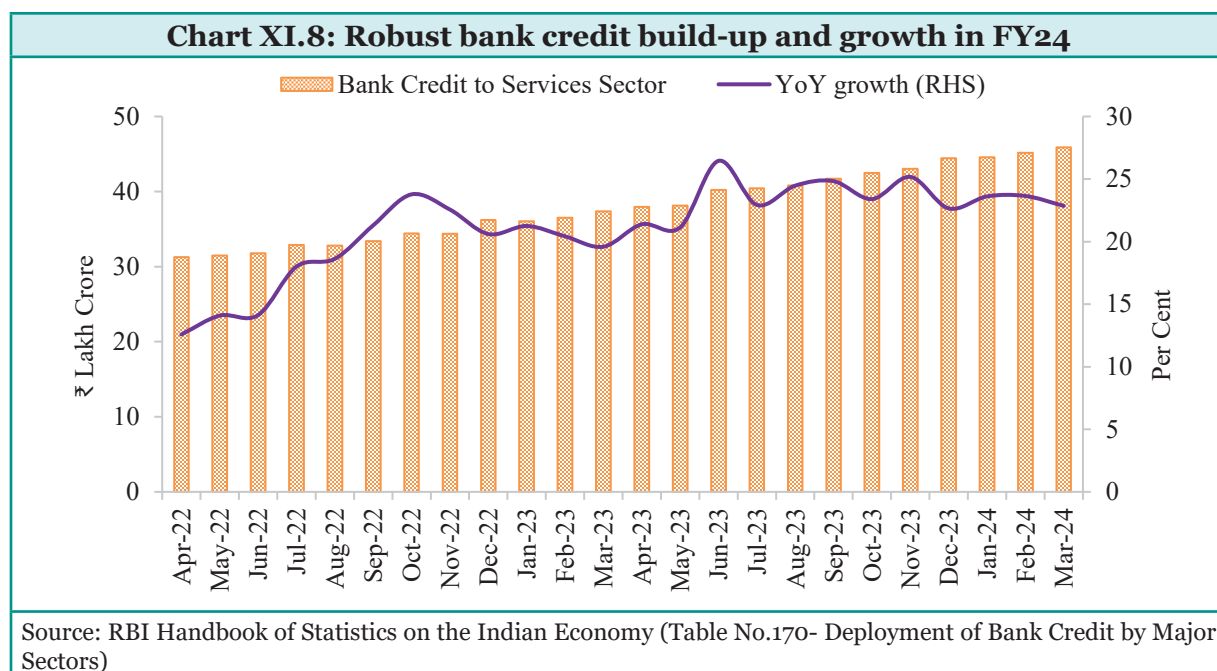
11.13 During FY24, services imports stood at USD 178.3 billion, a 2.1 per cent decrease on a YoY basis, dragged down by a reduction of global freight rates. The rise in services exports, coupled with a fall in imports, led to an increase in net services receipts on a YoY basis during FY24, which helped cushion India's current account deficit.

FINANCING SOURCES FOR SERVICES SECTOR ACTIVITY

11.14 The services sector fulfils its financing needs domestically through credit from domestic banks and capital markets and internationally through Foreign Direct Investment (FDI) and External Commercial Borrowings (ECBs). The following section explores in detail how the services sector secures its financing.

Bank credit

11.15 FY24 witnessed an upward trajectory of credit inflow in the services sector, with YoY growth rates surpassing the 20 per cent mark each month since April 2023. The financial year ended with an outstanding services sector credit of ₹45.9 lakh crore in March 2024, with a YoY growth of 22.9 per cent.¹⁰



9 World Trade Organization. (2024). Trade outlook 2024. (Appendix Table 5: Leading exporters of digitally delivered services, 2023) https://www.wto.org/english/res_e/booksp_e/trade_outlook24_e.pdf

10 RBI's Monetary Policy Report (April 2024) <https://rbi.org.in/Scripts/PublicationsView.aspx?id=22435>

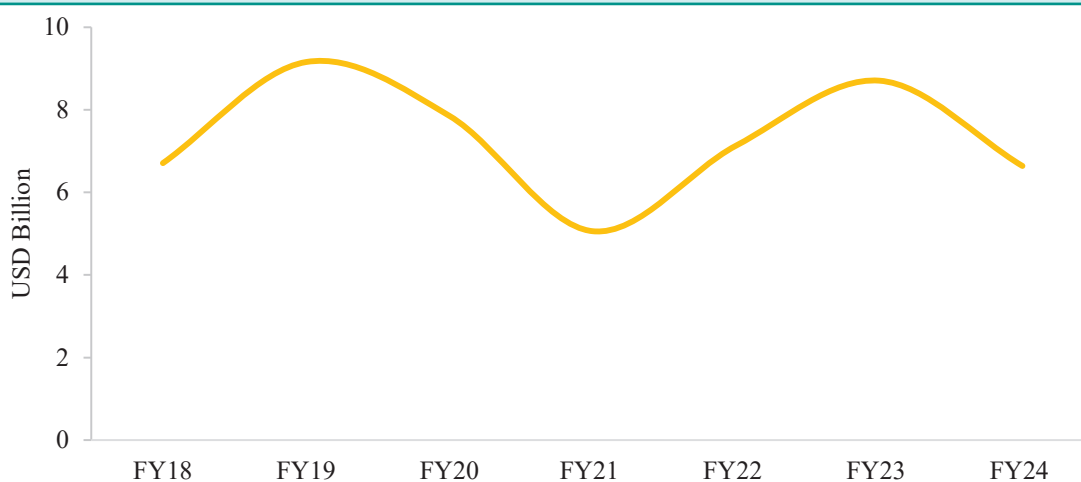
11.16 Credit to the services sector flowed across sub-sectors like transport operators, tourism, hotels and restaurants, aviation, professional services, trade, and commercial real estate. The aviation sector experienced the most significant credit inflow YoY growth of 56 per cent, attributed to increased aircraft leasing, hiring and a positive medium to long-term growth outlook.

External Financing

11.17 The United Nations Conference on Trade and Development (UNCTAD) has published the World Investment Report 2024 (WIR 2024) and has ranked India 15th in terms of FDI inflow (top 20 host economies) for the year 2023. As per the WIR 2024, India is the 2nd largest host country in terms of number of international project finance deals and 4th largest in terms of number of Greenfield project announcements.¹¹

11.18 FY24 witnessed a decline in the FDI equity inflows to the services sector (Chart XI.9), as in the case of the overall FDI equity inflows to India. Higher interest rates, geopolitical conflicts, heightened global uncertainties and rising protectionism that favour domestic sourcing have all contributed to lower FDI inflows into the sector.

Chart XI.9: Moderation in FDI equity inflows in the services sector



Source: Department for Promotion of Industry and Internal Trade (DPIIT) Publication- Quarterly FDI Statistics

Note: (i) The services sector includes Financial, Banking, Insurance, Non-Financial / Business, Outsourcing, R&D, Courier, Tech. Testing and Analysis, Others.

(ii) Values for FY23 and FY24 are provisional.

11.19 The services sector accounted for 53 per cent share in total external commercial borrowing (ECB) inflows in FY24. The sector received inflows of USD 14.9 billion in FY24, thereby registering a YoY growth of 58.3 per cent, as opposed to a growth of 23.3 per cent in FY23.¹²

MAJOR SERVICES: SECTOR-WISE PERFORMANCE

Physical connectivity-based services

11.20 Myriad services are offered to ensure the seamless movement of goods, people, and information across diverse infrastructure networks. Transportation services encompass

¹¹ United Nations Conference on Trade and Development (UNCTAD). (2023). World Investment Report 2023. <https://unctad.org/publication/world-investment-report-2023>

¹² Source: RBI. Data is mapped with the nearest possible industry classification.

a broad spectrum, ranging from passenger transport via trains, buses, taxis, and airlines to freight transport facilitated by shipping companies, freight forwarders, and courier services. Ancillary services such as vehicle maintenance and airport ground handling further complement these transportation offerings. Logistics services are crucial in optimising supply chains. The following sections shed light on services offered in roadways, railways, waterways and airways. It may be noted that the progress in the build-up of physical infrastructure in these sectors is covered in Chapter 12 and not repeated here.

Roadways

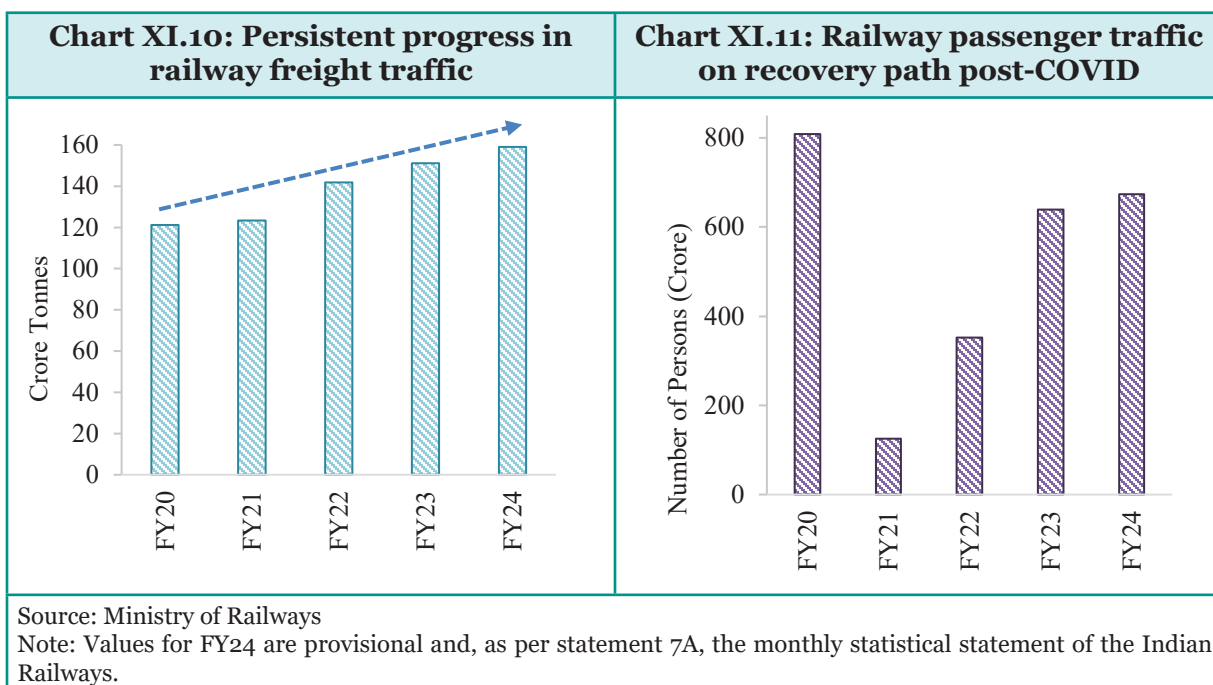
11.21 A considerable portion of India's cargo is transported via road. Accordingly, improving user convenience on National Highways (NH) is pivotal to enhancing overall NH quality. Toll digitisation has drastically reduced waiting times at toll plazas, from 734 seconds in 2014 to 47 seconds in 2024. Initiatives like free flow tolling through Automatic Number Plate Recognition and the Global Navigation Satellite System will enhance tolling efficiency in the future. Ministry of Road Transport and Highways (MoRTH) has also devised a comprehensive '4E' strategy - Engineering (roads and vehicles), Enforcement, Emergency Care, and Education - to elevate road safety standards on NHs. The Government has utilised the PM Gati Shakti National Master Plan portal for network planning and congestion projections, leveraging big data from e-waybills and FASTag to estimate future transportation demand and enhance logistics efficiency. The focus on development of access controlled high-speed corridors has impacted the quality of NH network. The development of expressways and economic corridors is reducing travel time significantly, thereby spurring economic development.¹³ The exceptional improvements in the development of highways are detailed in the section on Road Transport in Chapter 12.

11.22 Roadway services in India face challenges such as continuous ribbon development along highways, slow onboarding of digital land records and long clearance cycles, leading to delays in project execution. However, the Government is proactively addressing these issues by focusing on developing access-controlled national highways and upgrading existing ones. Implementing single-window clearances is crucial for enhancing roadway services' efficiency and effectiveness in India's transportation network. Addressing these challenges will help realise the full potential of road infrastructure.

Indian Railways

11.23 Indian Railways (IR) hosts many services to enhance user experience, efficiently manage the train system and build capacity for a Viksit Bharat. Passenger traffic originating in IR was 673 crore in FY24 (provisional actuals), increasing by about 5.2 per cent compared to the previous year. IR carried 158.8 crore tonnes of revenue-earning freight in FY24 (excluding Konkan Railway Corporation Limited), showing an increase of 5.3 per cent over the previous year. The freight loadings of the railways achieved CAGR of 7.1 per cent from FY20 to FY24, with the special emphasis on capacity addition, new rolling stock and improving operational efficiencies. Further details on IR are mentioned in the section on Rail Transport in Chapter 12.

¹³ PIB release dated 05 January 2024, MoRTH. <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1993425>



11.24 To upgrade the passenger experience, railways have introduced Wi-Fi facilities at 6108 stations, bridging the digital divide between rural and urban citizens. Indian Railway Catering and Tourism Corporation's (IRCTC) online ticketing system has emerged as one of the largest e-commerce websites in the country and Asia Pacific, and it is easily accessible through the website, mobile app, and IRCTC authorized agents. The Freight Operations Information System comprehensively manages all facets of freight operations, encompassing booking, electronic demand registration, transfer of railway receipts, and consignment tracking. The Rail Sugam App and Freight Business Development Portal have also been created to enhance customer convenience.

11.25 IR's train management system offers a comprehensive view of trains running with real-time train IDs. It contributes to train punctuality through improved planning and swift responses to emergencies. Maintenance of locomotives, coaches, and wagons has been digitised by applications such as Locomotive Asset Management, Coaching Management System, and Freight Wagon Management System software. The finance system of railways is Information Technology (IT) enabled. Bill passing is entirely electronic, with 99.9 per cent of expenditure and more than 90 per cent of revenue transactions being cashless. IR has digitised its procurement through a comprehensive IT system for material management known as the Indian Railways e-Procurement System and Integrated Material Management System. Railway's Human Resource Management System provides fully automated and centralised payroll, pensions, employee self-service, performance appraisal, pass, eService record, provident fund, etc.

11.26 To build capacity, IR has introduced eight centralised training institutes for its personnel in diverse fields. About 6.5 lakh railway officials have undergone training in FY24. Railways has also developed railway-specific learning content on the iGOT Karmayogi platform, where over 80 per cent of its officials are onboarded, and 12 per cent are currently enrolled in at least one course.

Ports, Waterways and Shipping

11.27 Increased decentralisation of decision-making, integration of professional expertise, and adoption of public-private partnership models have improved effectiveness and strengthened the management of ports. The port sector is leveraging the Sagar Setu application to streamline daily vessel and cargo operations, aspiring to become a central hub for all maritime engagements. Sagar Setu is also integrated with all the 13 major ports of India, along with 22 non-major ports and 28 private terminals.

11.28 There is a push for promoting river cruise tourism on national waterways. The development aimed at cargo ships also benefits tourist vessels, as improved waterways and facilities enhance their operations. Consequently, there has been a staggering 100 per cent surge in overnight cruise trips during FY24. Lighthouses are also emerging as significant tourist attractions. To attract visitors, development works such as museums, amphitheatres, and cafeterias at 75 lighthouses have been undertaken.

Chart XI.12: Sustained increase in shipping tonnage capacity



Source: Ministry of Ports, Shipping and Waterways

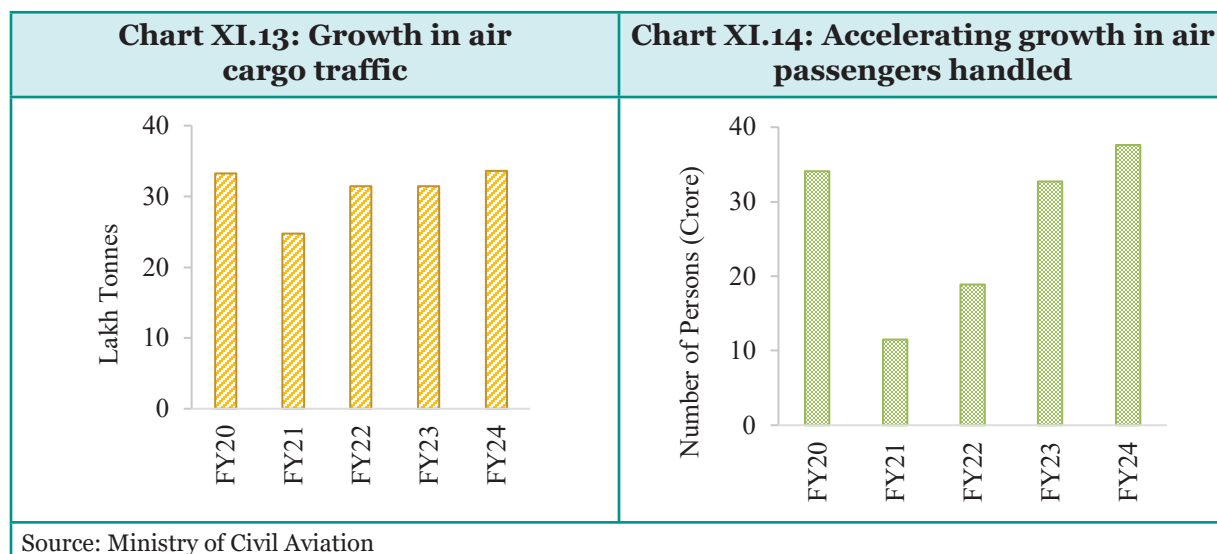
Airways

11.29 India is the third-largest domestic aviation market and one of the fastest-growing major aviation markets globally. The aviation sector in India has shown substantial growth, with a 15 per cent YoY increase in total air passengers handled at Indian airports reaching 37.6 crore in FY24.

11.30 In FY24, the domestic air passenger traffic handled increased by 13 per cent YoY to 30.6 crore, and international air passenger traffic handled increased by 22 per cent YoY to 7 crore. The growth in international traffic was higher than domestic traffic due to the lower recovery of international connectivity in FY23 from the COVID-19 impact. As against a 98 per cent recovery in FY23 for domestic passenger traffic, the international recovery was 86 per cent compared to pre-COVID levels. Air cargo handled at Indian airports increased by 7 per cent YoY to 33.7 lakh tonnes in FY24.

11.31 The civil aviation sector in India has tremendous potential owing to growing demand, increased economic activity, tourism, higher disposable incomes, favourable demographics, and

greater penetration of aviation infrastructure. Progressive government policies further support this growth momentum. The Government has approved 21 greenfield airports nationwide and operationalised new terminal buildings to increase passenger handling capacity backed by a solid capex plan. To promote regional equity, the ‘Ude Desh Ka Aam Nagrik’ (UDAN) scheme¹⁴ launched in 2016 facilitated the travel of over 141 lakh domestic passengers across various 579 Regional Connectivity Scheme routes connecting 85 unreserved and underserved airports since its inception.



11.32 Initiatives like Digi Yatra¹⁵ are enhancing efficiency through technology. Since its launch, more than 2.5 core passengers have benefited from this program. It is to be implemented at all airports in a phased manner.

11.33 The future of aviation services in India is anchored in the growth of the Maintenance, Repair, and Operations sector and the burgeoning drone industry. India aims to become a global drone hub by 2030, supported by liberalised regulations and incentives. Recent progress includes increased training organisations, remote pilot certificates, registered drones, and approved drone models. The promotion of the International Financial Services Centre (IFSC) at GIFT City has facilitated aviation leasing and financing, exemplified by Air India's recent aircraft acquisition. As of 31 March 2024, 27 entities have registered for the aircraft leasing business, and have leased more than 20 aircrafts, indicating the sector's promising outlook.

11.34 Economic growth necessitates the growth of the aviation industry and the need for expanded airport capacity, which, in turn, brings up sustainability concerns and the need for more skilled workers. As per the Directorate General of Civil Aviation, there are approximately 10,000 pilots with various airlines in India.¹⁶ Indian aviation sector stands out positively, with women constituting 15 per cent of the country's pilots, which is almost three times higher than

14 The objective of UDAN scheme is to connect small and medium cities with big cities through air service. Under the UDAN scheme, the airfare for a one-hour journey by a 'fixed wing aircraft' or half an hour's journey by a helicopter for about 500 km, has been fixed at (indexed to) ₹4000.

15 Digi Yatra uses facial recognition to verify passenger identities at various checkpoints, such as check-in, security, and boarding gates, without needing physical documents.

16 PIB release dated 23 March 2023, Directorate General of Civil Aviation (DGCA). <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1909941>

the global average, thus presenting greater opportunities for women in the sector.¹⁷ In the year 2023, a total of 1622 commercial pilot licenses were issued, of which 18 per cent were issued to women. Ministry of Civil Aviation and its associated organisations have taken steps to increase the number of pilots in the country. The Airports Authority of India issued award letters for nine new Flying Training Organisations (FTO) at five airports, namely Belagavi, Jalgaon, Kalaburagi, Khajuraho and Lilabari, in the first phase and six more FTOs at five airports, namely Bhavnagar, Hubballi, Kadapa, Kishangarh and Salem in the second phase.¹⁸ The sector holds significant potential, requiring collaborative efforts between the government, industry stakeholders, and international partners. Investments in infrastructure, skill development, and sustainability initiatives will fuel the future expansion of the aviation sector in India.

Tourism

11.35 The tourism sector in India is rapidly expanding, with India being ranked at the 39th position in the World Economic Forum's Travel and Tourism Development Index (TTDI) 2024.¹⁹ Showing positive signs of revival post-pandemic, the industry witnessed over 92 lakh foreign tourist arrivals²⁰ in 2023, implying a YoY increase of 43.5 per cent. India has significantly earned foreign exchange receipts amounting to over ₹2.3 lakh crore through tourism, indicating a 65.7 per cent YoY increase. India's share of foreign exchange earnings in world tourism receipts increased from 1.38 per cent in 2021 to 1.58 per cent in 2022.

Chart XI.15: Steady progress in India's ranking in International Tourist Arrivals (ITA)

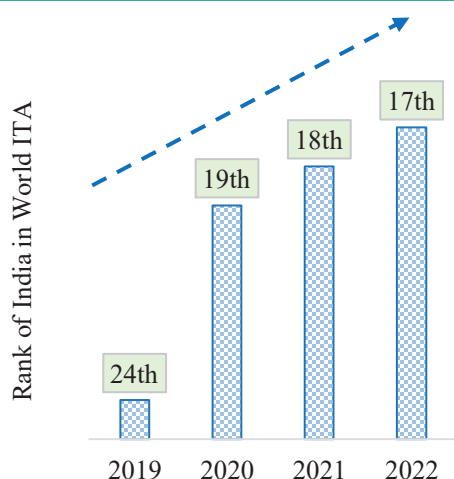
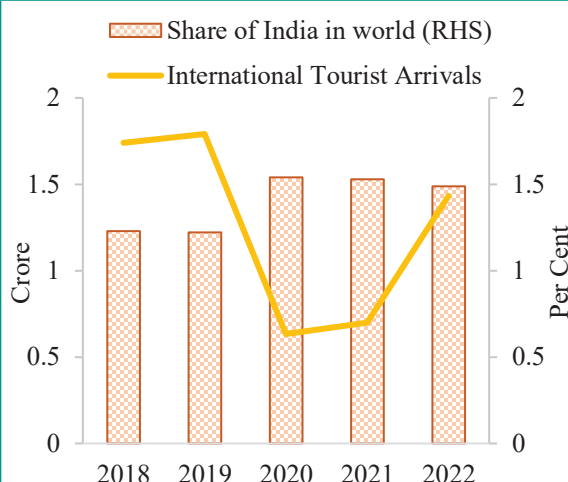


Chart XI.16: Resilient recovery of International Tourist Arrivals (ITA)



Source: Data for 2019 and 2020 is from the Bureau of Immigration Source. Data for 2021 and 2022 is from the UNWTO barometer for January 2024.

Note: (i) For chart XI.15, values for 2021 and 2022 are provisional

(ii) For chart XI.16, the value for 2022 is provisional.

17 PIB release dated 19 January 2024, Prime Minister's Office. <https://pib.gov.in/PressReleasePage.aspx?PRID=1997799>

18 PIB release dated 05 February 2024, Ministry of Civil Aviation. <https://pib.gov.in/PressReleasePage.aspx?PRID=2002542>

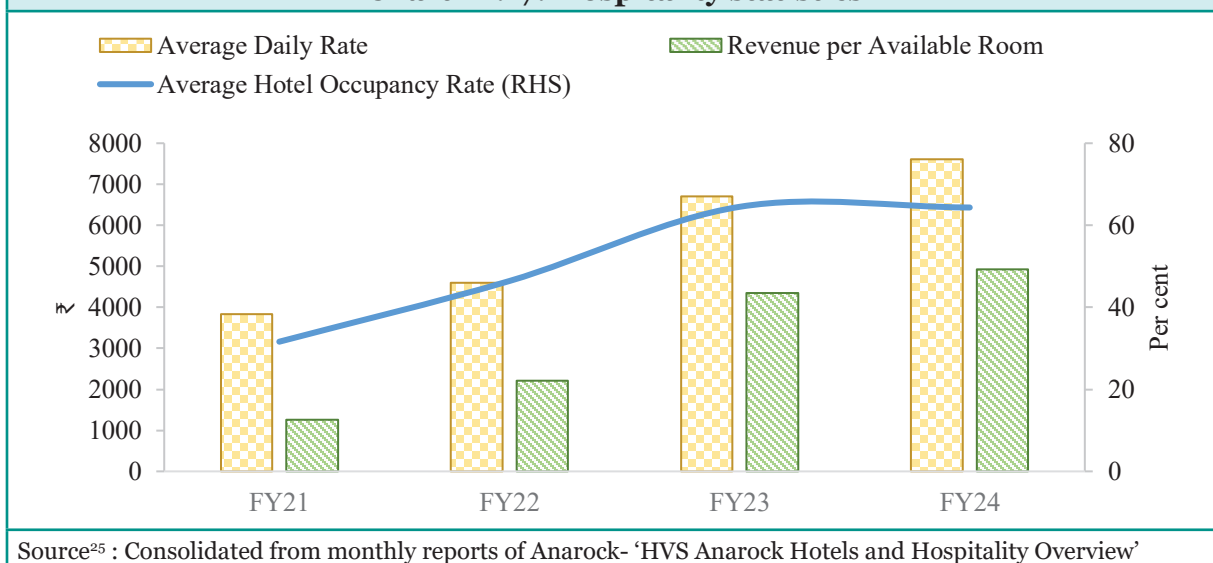
19 World Economic Forum. (2024). WEF Travel and Tourism Development Index 2024. https://www3.weforum.org/docs/WEF_Travel_and_Tourism_Development_Index_2024.pdf

20 As per the UNWTO definition, International Tourist Arrivals (ITAs) comprises two components, namely Foreign Tourist Arrivals (FTAs) and Arrivals of Non-Resident Nationals.

11.36 The hospitality industry has risen to meet the increasing number of tourists' needs and to elevate the overall guest experience. In 2023, the highest amount of new supply was created with the addition of 14,000 rooms, bringing the total inventory of chain-affiliated rooms to 183,000 in India.²¹ Hoteliers are increasingly leveraging technology to personalise guest experiences and improve operational efficiencies. Hotels are also adopting innovative operational strategies, such as leasing or managing external restaurant, spa, and lounge brands, to capitalise on established concepts that attract hotel residents, thereby boosting revenue.²² In FY24, the average daily rate increased from ₹6704 to ₹7616, marking a YoY growth of 13.6 per cent.²³

11.37 India holds enormous potential in expanding tourism, and several government initiatives support the sector's progress. Under the 'Pilgrimage Rejuvenation and Spiritual Augmentation Drive' (PRASHAD)²⁴ scheme, 29 new sites have been identified for tourism infrastructure development, and 12 have been inaugurated. Swadesh Darshan 2.0, focusing on integrated tourism destination development, targets 55 destinations across 32 states and Union Territories. India chaired the first Shanghai Cooperation Organisation (SCO) Tourism Expert Working Group, deliberating on collaborative strategies among SCO member nations. The Ministry organised the 11th International Tourism Mart and Bharat Parv 2023 to promote tourism and cultural exchange. Alongside these efforts, the Government has implemented various measures to support the tourism industry, including policy reforms and infrastructure development.

Chart XI.17: Hospitality statistics



21 Horwath HTL. (February 2024). India Hotel Market Review Report 2023. <https://horwathhtl.com/wp-content/uploads/sites/2/2024/02/India-Hotel-Market-Review-Report-2023.pdf>

22 HotelAssociationofIndia&BenoriKnowledge.Vision2047:IndianHotelIndustry.<https://hotelassociationofindia.com/Vision%202047%20-%20March%2030.pdf>

23 Consolidated from monthly reports of Anarock (HVS Anarock Hotels & Hospitality Overview) from March 2023 to April 2024.

24 This scheme focuses on developing and identifying pilgrimage sites across India for enriching the religious tourism experience. It aims to integrate pilgrimage destinations in a prioritised, planned and sustainable manner to provide a complete religious tourism experience.

25 It is consolidated using monthly reports (HVS Anarock Hotels & Hospitality Overview) from April 2020 to March 2024. Annual averages are calculated using monthly data from the respective months' report.

11.38 The tourism sector has embraced the digital revolution. One such initiative is E-Marketplace, designed to facilitate interactions between tourists and certified tourist facilitators and guides through web and mobile applications. The Union Government, in collaboration with State Governments and Union Territory administrations, is actively working on registering accommodation units nationwide in the National Integrated Database of Hospitality Industry (NIDHI) portal. This database will aid in formulating effective policies and strategies for promoting tourism. Another noteworthy initiative is SAATHI (System for Assessment, Awareness and Training for Hospitality Industry), which aims to prevent further transmission of viruses by educating the hospitality industry on government COVID regulations.

Table XI.1: India ranked 39th in Travel and Tourism Development Index, 2024

Enabling Environment					T&T Policy and Enabling Conditions			Infrastructure and Services			T&T Resources			T&T Sustainability		
Business Environment	Safety and Security	Health and Hygiene	Human Resources and Labour Market	ICT Readiness	Prioritisation of T&T	Openness to T&T	Price Competitiveness	Air Transport Infrastructure	Ground and Port Infrastructure	Tourist Services and Infrastructure	Natural Resources	Cultural Resources	Non-Leisure Resource	Environmental Sustainability	T&T Socioeconomic Impact	T&T Demand Sustainability
3.79	5.06	3.47	2.85	3.84	4.11	4.13	5.66	4.59	4.43	1.6	5.8	5.62	5.05	3.64	4.01	4.55

Source: World Economic Forum's (WEF) Travel and Tourism Development Index (TTDI) 2024 Report²⁶
 Note: T&T – Travel and Tourism

11.39 India's travel and tourism (T&T) sector has been influenced by global inflationary pressures and delays in the recovery of T&T capacity, similar to other economies. However, the decline in price competitiveness since 2021 has been minimal compared to its peers, with only a 0.7 per cent drop. India's decline is particularly slight at just 0.1 per cent from 2021 levels, which reflects the Government's consistent efforts to maintain stability despite the slowdown caused by the COVID-19 pandemic. WEF's TTDI 2024 report emphasizes the need for improvements in tourist services and infrastructure, and the development of a skilled workforce. In a challenging environment for employment generation in services due to the rise of AI and manufacturing due to rising protectionism, transportation costs and supply concerns, the tourism sector represents a relatively low-hanging fruit for job creation. India has to seize the opportunity. To formalise employment within this sector, the Ministry of Tourism has initiated the Incredible India Tourism Facilitator Certificate Programme²⁷. This program aims to create a skilled cadre of tourist facilitators nationwide through a digital platform that offers online learning opportunities and certification courses.²⁸

²⁶ World Economic Forum (May 2024)- Travel and Tourism Development Index (TTDI) 2024. https://www3.weforum.org/docs/WEF_Travel_and_Tourism_Development_Index_2024.pdf

The scores assigned to the 17 pillars mentioned in the table are calculated based on data derived from the Executive Opinion Survey (the Survey) and quantitative data from other sources. The survey data ranges in value from 1 (worst) to 7 (best) and Quantitative data indicators are normalised to a 1-to-7 scale in order to align them with the Executive Opinion Survey's results.

²⁷ Link of the website - <https://iitf.gov.in/>

²⁸ PIB release dated 21 July 2024, Ministry of Tourism. <https://pib.gov.in/PressReleasePage.aspx?PRID=1843507>

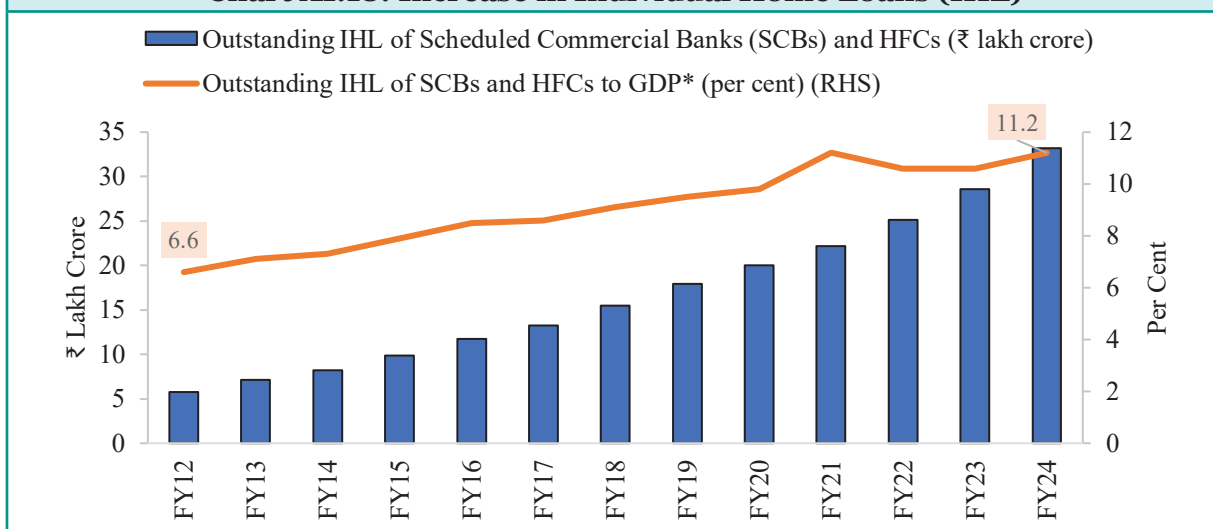
Real Estate

11.40 Real estate and ownership of dwellings have accounted for over seven per cent of the overall GVA in the past decade, highlighting their integral role in the economy. Following two challenging years of pandemic-induced lockdowns and economic instability, the real estate sector has experienced a robust recovery. The pandemic has shifted homebuyers' preferences toward larger, sustainable spaces with additional amenities, driven by remote and hybrid working trends. This shift has also spurred interest in peripheral areas close to city centres. Factors contributing to the sector's growth include rapid urbanisation, rising income levels, the emergence of nuclear families, new entrants in the market, and improved financial options for developers and homebuyers. The strong desire for home-ownership was reinforced during the pandemic, acting as a catalyst.

11.41 In 2023, residential real estate sales in India were at their highest since 2013, witnessing a 33 per cent YoY growth, with a total sale of 4.1 lakh units in the top eight cities. The new supply witnessed an all-time high, with 5.2 lakh units launched in 2023, as against 4.3 lakh units in 2022. The momentum continued in Q1 of 2024, witnessing record-breaking sales of 1.2 lakh units, clocking a robust 41 per cent YoY growth. New supply has consistently exceeded one lakh units since Q2 of 2022, underscoring persistent demand-supply dynamics in the housing market.²⁹

11.42 Further, the rising demand for housing loans reflects the underlying demand for real estate. Housing loans as a percentage of GDP increased from FY12 to FY24 (Chart XI.18). Traditionally, banks have been the most significant players in the housing finance sector. However, Housing Finance Companies (HFCs) have significantly contributed to this landscape over the years. They played a complementary role with banks in providing housing credit to the bottom of the pyramid. The share of outstanding housing loans as a percentage of total loans of HFCs stood at 70.8 per cent as of 31 March 2024.

Chart XI.18: Increase in Individual Home Loans (IHL)



Source: RBI & National Housing Bank (NHB)

*Note: GDP at current prices is considered.

²⁹ PropTiger. (04 January 2024). New home sales record 33% YoY growth in 2023: PropTiger.com report. <https://www.proptiger.com/guide/post/new-home-sales-record-33-yoy-growth-in-2023-proptiger-com-report>

11.43 The housing sector's growth has been due to several key factors. The Pradhan Mantri Awas Yojana-Urban (PMAY-U), launched in 2015, has sanctioned over 1.2 crore houses for urban beneficiaries, ensuring durable housing. Policy reforms like the Goods and Services Tax, Real Estate (Regulation and Development) Act, and the Insolvency and Bankruptcy Code have boosted transparency and investor confidence in real estate. Initiatives like the Affordable Housing Fund and Special Window for Affordable and Mid-Income Housing (SWAMIH) Investment Fund have supported affordable housing projects. PMAY(U)-Credit Linked Subsidy Scheme interest subvention has been a primary demand-side driver, with the National Housing Bank (NHB) releasing ₹49,460.1 crore in subsidies benefiting over 21.1 lakh households by March 2024. The co-lending model, combining bank liquidity with HFCs', aims to extend housing credit to a broader segment, including low-income groups. The Urban Infrastructure Development Fund, managed by NHB with an initial corpus of ₹10,000 crore, is expected to improve urban infrastructure, attracting real estate investment.

Box XI.2: Building Trust: How RERA is Reshaping Real Estate

The Real Estate (Regulation & Development) Act, 2016 (RERA), was enacted to bring about much-needed reform in India's real estate sector. The main objective of RERA is to encourage greater transparency, citizen-centricity, accountability, and financial discipline, thus empowering home buyers and boosting the economy. All States/ Union Territories (UTs) have notified rules under RERA except Nagaland, which is in the process of notifying the rules.

Key measures and outcomes from RERA's implementation

- **Developer Accountability:** Developers frequently failed to deliver promised project features, layouts, and amenities, thereby misleading homebuyers. RERA now mandates an 'Agreement to Sale' at the time of registration and requires two-thirds consent from allottees/homebuyers for any layout changes. RERA also specifies provisions for refund, compensation, and penalties applicable to all stakeholders in cases of obligation contraventions.
- **Fair Transactions:** Before RERA was enacted, there were many cases of builders not delivering flats or homes despite full payments from homebuyers. To address this, under RERA, it is mandated that 70 per cent of funds collected from homebuyers for a project must be maintained in a separate bank account dedicated to project construction and land costs.
- **Disclosures and Mandatory Registration:** RERA has also made it mandatory for developers and project promoters to make all necessary disclosures about projects, including permissions secured from authorities, date of launch, promised date of delivery, project specifications, and amenities.³⁰ Further, homebuyers' interests are protected as only the projects (above 500 square metres and above eight apartments) registered with RERA can be launched, thereby obviating the possibility of any misrepresentation or false promises by the developers.³¹ As of 01 July 2024, over 1,30,186 real estate projects and 88,461 real estate agents have been registered under RERA.

30 PIB release dated 12 October 2018, Ministry of Housing and Urban Affairs. <https://pib.gov.in/PressReleasePage.aspx?PRID=1549548>

31 PIB release dated 01 November 2021, Ministry of Housing and Urban Affairs. <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2021/nov/doc202111121.pdf>

- **Dispute Resolution:** RERA provides for the establishment of a fast-track dispute resolution mechanism for the settlement of disputes. As of 01 July 2024, 32 States and UTs have set up the Real Estate Regulatory Authority, and 1,24,947 complaints have already been disposed of.

After the enactment of RERA, India is ranked 36th in the Global Real Estate Transparency Index in 2022.

11.44 The outlook for the real estate sector is encouraging. With increasing urbanisation, the housing industry is poised for a significant transformation. As per the United Nations, by 2050, half of India's population is projected to dwell in urban regions, compared to 31 per cent in 2011.³² This underscores the need to adapt strategies and policies to meet the rising demand for housing and offer viable, cost-effective, sustainable solutions.

11.45 Digitisation of land records is poised to improve transparency in land transactions, diminish property ownership conflicts, and enhance the efficiency of land management. Implementing a single-window clearance system for construction approvals will also accelerate construction processes, minimising delays and uncertainties. The streamlining of approvals is set to consolidate and systematise India's residential real estate sector further.

11.46 The legacy stalled real estate projects is a challenge. Approximately 4.1 lakh stressed dwelling units, involving ₹4.1 lakh crore, are affected, as estimated by the Indian Banks' Association (IBA). The Ministry of Housing and Urban Affairs (MoHUA) established a committee to recommend solutions for completing stalled projects to address this issue.³³ The committee identified the primary cause of stress as lack of financial viability, resulting in cost overruns and delays. Its recommendations include mandatory project registrations with RERA, execution of registration and sub-lease deeds for occupied units, ensuring possession of substantially completed projects, proposing state government rehabilitation packages for promoter-led resolutions, establishing frameworks for RERA and administrator-led project revivals, financing stalled projects, and utilising IBC as a last resort for resolving projects.

11.47 According to a report by Crisil, the housing loan market in India grew at a CAGR of approximately 13 per cent from FY18 to FY23. It is expected to continue growing at a CAGR of 13 to 15 per cent reaching ₹42 lakh crore to ₹44 lakh crore by FY26. NHB has introduced a Residential Mortgage-Backed Securities (RMBS) platform to address funding options limitations. This platform aims to attract long-term resources from diverse investor groups, including Pension Funds and Insurance Funds, to support the expansion of housing finance and deepen the debt market for primary mortgages. The RMBS platform will help reduce asset-liability mismatches for lending institutions, ensuring adequate liquidity in the housing finance sector.

32 United Nations. (2018). World Urbanization Prospects: The 2018 Revision – Highlights (Page 23). <https://population.un.org/wup/Publications/Files/WUP2018-Highlights.pdf>

33 Ministry of Housing and Urban Affairs. (July 2023). Report of the Committee to examine the issues related to legacy stalled real estate projects. [https://mohua.gov.in/upload/uploadfiles/files/report\(1\).pdf](https://mohua.gov.in/upload/uploadfiles/files/report(1).pdf)

11.48 Going forward, the demand for housing is expected to be driven by affordability and increased access to credit. As of March 2024, the shares of Southern, Western and Northern states in the individual housing loans outstanding are 35.4 per cent, 31.2 per cent and 26.2 per cent, respectively. The Eastern States at 6.9 per cent and the eight North-eastern and Hilly states combining to 0.95 per cent share present an opportunity for undertaking initiatives for improving penetration.

11.49 Sustainability and technology have emerged as significant disrupters for the real estate sector. Sustainability will influence green construction practices and energy-efficient designs, while technology will revolutionise smart homes and data-driven insights. With more significant environmental concerns, the focus will be on energy-efficient systems, rainwater harvesting and smart building technologies.

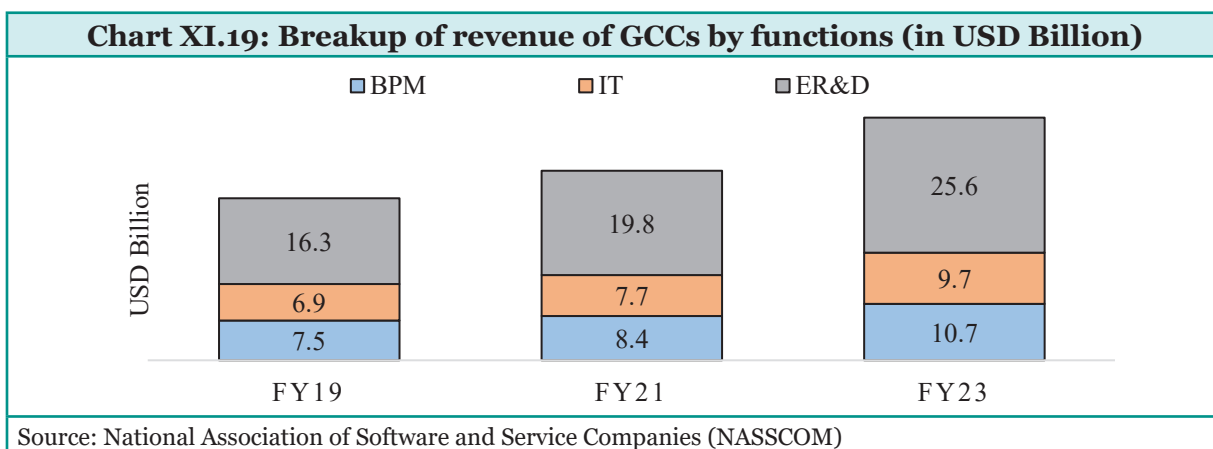
Information Technology Services, Tech start-ups and Global Capability centres

Information Technology (IT) services

11.50 Over the past decade, information and computer-related services have become increasingly significant, with their share of total GVA rising from 3.2 per cent in FY13 to 5.9 per cent in FY23. Despite the pandemic-induced economic downturn, this sector achieved a real growth rate of 10.4 per cent in FY21. The COVID-19 pandemic expedited the advancement and uptake of technology-driven solutions, fuelling the growth of this sector. The IT and IT-enabled services have been instrumental in maintaining the country's external balance through export earnings, which are set to increase further. The flourishing growth of IT services has also supported the expansion of Global Capability Centres (GCCs) and the tech start-up ecosystem in India.

Global Capability Centres

11.51 Global Capability Centres (GCCs) in India have grown significantly, from over 1,000 centres in FY15 to more than 1,580 centres, with over 2,740 units by FY23. These centres contribute to economic growth by providing high-quality employment. In FY23, the total talent employed in Indian GCCs exceeded 16.6 lakh. Of this workforce, over 42 per cent are engaged in engineering, research, and development (ER&D), 34.5 per cent in business process management (BPM), and 23.4 per cent in IT services. The software, internet and banking, financial services, and insurance (BFSI) sectors collectively account for about 58 per cent of India's IT GCC talent. Revenue from India's GCCs has increased from USD 19.4 billion in FY15 to USD 46 billion in FY23, growing at a compound annual growth rate (CAGR) of 11.4 per cent.



11.52 As per National Association of Software and Service Companies (NASSCOM), the key drivers for the growth of ER&D in India include strategic long-term partnerships, extensive digitalisation, and the adoption of cloud technologies. The IT services segment has expanded due to increased demand for application modernisation, cloud migration, platform development, and enhanced cybersecurity measures. The BPM sector in Indian GCCs has grown by transitioning from traditional services to more intelligent operations and data-driven solutions.

11.53 The technology sectors are dynamic and continually evolving, making them lucrative for employees and businesses. IT positions remain among the most in-demand roles in the global job market. Despite the high demand, these sectors are experiencing a talent gap, with a shortage of IT, data science, and cybersecurity workers. As per a survey³⁴, for Q3 2024, 76 per cent of IT employers reported difficulty in finding the skilled talent required globally. To incentivise GCCs in India, promoting specialisations in higher education is essential. Focus areas should include Blockchain, Artificial Intelligence (AI), Machine Learning, Internet of Things, Cybersecurity, Cloud Computing, Big Data Analytics, Augmented Reality, Virtual Reality, 3D Printing, and Web and Mobile Development.

11.54 Several initiatives are in place to bridge the talent gap. Conceived as a first-of-its-kind initiative, 'Future Skills PRIME', which is a joint initiative by Ministry of Electronics & Information Technology (MeitY) and NASSCOM, aims to create an up-skilling and re-skilling ecosystem in focus areas to facilitate the continuous enhancement of skills of IT professionals in line with their aspirations and aptitude.³⁵ The Government initiated a Digital Skilling program in emerging and future technologies, aiming to skill, reskill, and upskill one crore students through internships, apprenticeships, and employment opportunities.³⁶ Pradhan Mantri Kaushal Vikas

³⁴ ManpowerGroup. (2024). Global Employment Outlook: Third Quarter 2024. https://go.manpowergroup.com/hubfs/GLOBAL_EN_MEOS_Report_3Q24.pdf

The ManpowerGroup Employment Outlook Survey is a forward-looking employment survey used globally as a key economic indicator. The Survey is based on interviews with 40,374 public and private employers across 42 countries and territories to measure anticipated employment trends each quarter.

³⁵ PIB release dated 29 October 2021, MeitY. <https://pib.gov.in/PressReleasePage.aspx?PRID=1767604>

³⁶ PIB release dated 06 June 2022, Ministry of Education. <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1831624>

Yojana (PMKVY 4.0) focuses on skill development among youth, offering training in cutting-edge fields such as Industry 4.0³⁷, AI, robotics, mechatronics, Internet of Things, and drones.³⁸

Technology start-ups in India

11.55 The COVID-19 pandemic fuelled consumer and enterprise demand for technology-backed solutions. The number of technology start-ups in India rose remarkably from around 2,000 in 2014 to approximately 31,000 in 2023. As per NASSCOM, the sector witnessed the inception of roughly 1000 new tech start-ups in 2023.

11.56 The top sectors for start-ups in 2023 were EdTech (16 per cent), EnterpriseTech (12 per cent), BFSI (10 per cent), Advertising and Marketing (7 per cent), RetailTech (6 per cent), Media and Entertainment (5 per cent), ConsumerTech (5 per cent), Professional services (4 per cent) and Gaming (4 per cent).

11.57 Several factors have contributed to the rise of start-ups in various sectors. Changes in consumption patterns and increased internet penetration paved the way for retail tech start-ups. The BFSI sector saw a surge in start-ups starting in 2016, driven by significant events such as the introduction of UPI. The demand for scalable and efficient cloud solutions led to the growth of Software as a Service (SaaS) start-ups, resulting in 21 unicorns since 2014. The COVID-19 pandemic accelerated growth in sectors like HealthTech and EdTech, spurred by the increased need for tele-consulting and remote learning solutions.

11.58 As per NASSCOM, India's tech start-up ecosystem ranks third globally and has performed considerably better than the USA and the UK.³⁹ The strength of the Indian tech start-up ecosystem lies in its large pool of start-ups, unicorns, and ability to scale. With 16 per cent of the world's AI talent, India positions itself as an innovation hub, showcasing rapid adoption of AI skills.

11.59 The Start-up India Initiative and Start-up hubs across ministries and departments of the Government of India have aided the growth of tech start-ups. Some other significant initiatives are the National Deep Tech Start-up Policy, the Drone Shakti Program and custom duty exemptions for EV-related capital goods and machinery. Targeted efforts undertaken to tap this start-up potential further are elaborated below.

- **Accelerating and strengthening the deep-tech ecosystem:** As of 31 March 2024, there are more than 1.25 lakh DPIIT-recognized start-ups spanning across all sectors of the economy, out of which there are over 13,000 start-ups that cover sectors like AI, Internet of Things, Robotics, and Nanotechnology. The draft National Deep Tech Start-up Policy (NDTSP)⁴⁰ is a comprehensive framework to tackle deep tech start-ups' challenges.

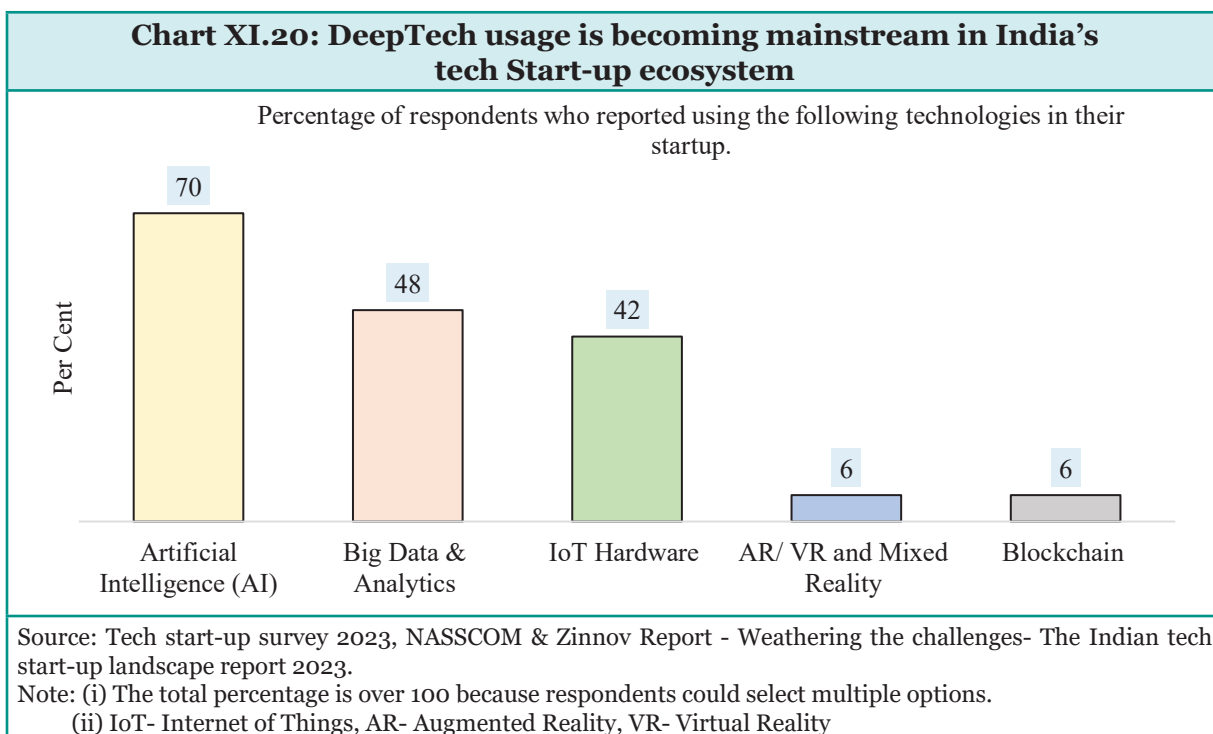
37 Industry 4.0 is a term given to the current trend of automation, interconnectivity and data exchange in manufacturing technologies to increase productivity.

38 PIB release dated 26 December 2023, Ministry of Skill Development and Entrepreneurship. <https://pib.gov.in/PressReleasePage.aspx?PRID=1990495>

39 NASSCOM & Zinnov (2023). Weathering the challenges -The Indian tech start-up landscape report 2023. <https://www.nasscom.in/knowledge-center/publications/weathering-challenges-indian-tech-start-landscape-report-2023>

40 Draft National Deep Tech Start-up Policy 2023 (Page 3). <https://psa.gov.in/CMS/web/sites/default/files/process/NDTSP.pdf>

The policy addresses vital barriers such as limited funding, resource and infrastructure constraints, and understanding the risks associated with cutting-edge technologies. It intervenes by designing funding mechanisms that embrace the concept of ‘failing by design’, conducting funding awareness programs for start-up founders to diversify their funding sources, establishing a centralised core mission office to streamline approval processes and facilitate intellectual property protection, fostering awareness in Tier 2 and 3 cities, and designing a monitoring mechanism based on mapping key performance indicators.



- Strengthening domestic capital flow:** The Government has established a Fund of Funds for Start-ups with a corpus of ₹10,000 crores to meet the funding needs of start-ups. It has not only made capital available for start-ups at an early stage, seed stage and growth stage but also played a catalytic role in facilitating the raising of domestic capital, reducing dependence on foreign capital and encouraging homegrown and new venture capital funds. Recognising the importance of early-stage support for enterprise growth, the Start-up India Seed Fund Scheme, launched in 2021, aims to provide financial assistance to start-ups for proof of concept, prototype development, product trials, market-entry, and commercialisation.⁴¹
- Leveraging initiatives such as Start-Up India:** The Start-up India initiative helps connect the Indian start-up ecosystem to global start-up ecosystems. Start-up India has engaged in several bilateral and multilateral forums to build cross-border knowledge exchange systems and facilitate cross-border incubation and acceleration programs.⁴²

41 PIB release dated 29 March 2023, Ministry of Commerce & Industry. <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1911913>

42 Department for Promotion of Industry and Internal Trade (DPIIT). States’ start-up ranking 2022 (Page 25). https://www.startupindia.gov.in/srf-2022/SRF_2022_Result_page/National_Report_14_01_2024.pdf

Telecommunications

11.60 Telecommunication is the gateway to the fast-paced growth of digital services in India. The overall teledensity (number of telephones per 100 population) in India increased from 75.2 per cent in March 2014 to 85.7 per cent in March 2024.⁴³ The number of wireless telephone connections stood at 116.5 crore at the end of March 2024. The Government has placed considerable emphasis on the growth of internet and broadband as part of the Digital India campaign. As a result, internet subscribers jumped from 25.1 crore in March 2014 to 95.4 crore in March 2024, of whom 91.4 crore are accessing the internet via wireless phones. The internet density also increased to 68.2 per cent in March 2024. The cost of data has declined substantially, vastly improving the average wireless data usage per subscriber.

11.61 5G services were first launched in India in October 2022. Currently, India is amongst the fastest-growing 5G networks in the world. After the launch of 5G services, India's international rank in mobile broadband speed has improved from 118 to 15 (March 2024). The '5G Test Bed', dedicated to the nation in 2022, provides an end-to-end testing facility, enabling R&D teams in Indian academia and industry to validate their products, prototypes, and algorithms and demonstrate various services. The Bharat 5G Portal propels India's 5G capabilities and fosters innovation, collaboration, and knowledge-sharing within the telecom sector.

11.62 Based on the recommendations of the Technology Innovation Group on 6G, the Bharat 6G Vision document was launched in March 2023 to develop and deploy 6G network technologies in India. It also led to the constitution of Bharat 6G Mission and an Apex Council to lay down the Phase-wise objectives of the 6G Mission. The Bharat 6G Alliance was also launched in July 2023 as a collaborative platform of public and private companies, academia, research institutions and standards development organisations to enable India to become a leading global supplier of IP, products and solutions of affordable 5G, 6G and other future telecom solutions.

11.63 The Amended BharatNet Program is now being rolled out to provide broadband connectivity to all Gram Panchayats in the country. As of 31 March, 2024, 6,83,175 kilometers of Optical Fibre Cable (OFC) has been laid, connecting a total of 2,06,709 Gram Panchayats (GPs) by OFC in the BharatNet phase I & II.

11.64 The Government has also implemented multiple structural and procedural reforms to promote healthy competition, reduce the regulatory burden on telecom service providers, and protect consumers' interests. These include rationalising the definition of adjusted gross revenue, spectrum-related reforms like allowing sharing and trading of spectrum and rationalising spectrum usage charges, permission for 100 per cent foreign direct investment in the telecom sector under automatic route subject to safeguards, etc. The Telecommunications Act 2023 amends and consolidates the laws relating to telecommunication services and telecommunication networks, assignment of spectrum, etc.

11.65 Telecommunication technology development requires significantly large and patient capital for R&D and commercialisation. To address this, the Government has decided that

⁴³ Press Release No.36 dated 04 July 2024. Telecom Regulatory Authority of India https://www.trai.gov.in/sites/default/files/PR_No.36of2024.pdf

an allocation of 5 per cent of annual collections from the Universal Services Obligation Fund⁴⁴ (USOF) would be made available for funding R&D in the telecom sector. The Telecom Technology Development Fund formulated in 2022 has seen significant participation from start-ups, MSMEs, academia and industry.

11.66 New courses have been suggested to align engineering programs in electronics and communications with evolving needs in the industry. Skill courses related to 5G and 5G-enabled technology have been approved by the National Council for Vocational Education and Training (NCVET). All India Council for Technical Education (AICTE) has also included 5G as a thrust area in the AICTE Training and Learning Academy scheme for the faculty development program.

11.67 Sanchar Saathi portal⁴⁵, launched in May 2023, is a citizen-centric initiative to empower mobile subscribers, strengthen their security and increase awareness. Sanchar Saathi portal has several components, including the Chakshu facility, launched in March 2024, to report suspected fraud communications. Based on complaints received, appropriate actions are being taken.

E-Commerce

11.68 The Indian e-commerce industry is expected to cross USD 350 billion by 2030. The Indian retail market is largely unorganised. However, over the next 3 to 5 years, the share of modern retail (including e-commerce) will increase to 30-35 per cent of the total retail.⁴⁶

11.69 India's e-commerce market has gained significant momentum during the past few years owing to technological advancements, evolving new-age business models coupled with government initiatives like the Digital India program, UPI, One District - One Product (ODOP) initiative, Open Network for Digital Commerce (ONDC), new foreign trade policy, relaxation in FDI limits and Consumer Protection (E-Commerce) (Amendment) Rules 2021. At the heart of the rapid expansion of e-commerce is the diversity of benefits the e-marketplace offers sellers and consumers compared to traditional brick-and-mortar markets.

11.70 The rise of e-commerce is constrained by inadequate skills required for online selling, such as cataloguing. Data privacy issues and increasing online fraud have turned out to be the most significant hurdle in the growth of e-commerce in India. It becomes imperative to educate users on the safe use of e-commerce platforms. For starters, the Government has implemented several initiatives to ensure the safe use of e-commerce platforms. Key regulations include the Consumer Protection (E-Commerce) Rules, 2020, to safeguard consumers from unfair trade practices in e-commerce and the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021, ensuring digital platform accountability. The Digital Personal Data Protection Act, 2023 provides a comprehensive data protection framework, further safeguarding consumer information.

44 The Universal Service Obligation Fund (USOF) aims to provide quality and affordable mobile and digital services across the rural and remote areas of the country, allowing non-discriminatory access to mobile and network services along with equitable access to knowledge and information dissemination, leading to rapid socio-economic development with improved standard of living.

45 Link of the website - <https://sancharsaathi.gov.in/>

46 Invest India. E-commerce: Fastest growing e-commerce market in the World. <https://www.investindia.gov.in/sector/retail-e-commerce>

11.71 To raise awareness, the Government runs the Jago Grahak Jago campaign, providing consumers with information on their rights and safe e-commerce practices. The National Consumer Helpline (NCH) offers guidance and resolves consumer grievances.⁴⁷ Various consumer awareness programs, including digital literacy workshops and cyber safety sessions, are organised in collaboration with NGOs and educational institutions. Additionally, interactive sessions and webinars with experts and officials keep consumers informed about the latest trends and safety measures in the e-commerce sector.

11.72 The buyer ecosystem in India is evolving at a very sharp rate, and business models will need to innovate to serve the needs of a diverse shopper base regarding service expectations, price sensitivity and language requirements. Local language platforms are needed as the shopper base expands to tier-2 and tier-3 cities. Growing start-ups and innovative social media platforms provide an opportunity to test unique business models that might be targeted to specific demographic cohorts.⁴⁸ E-commerce's future is built on the enhanced user experience through AI, seamless digital payment methods, innovations like UPI, and business engineering data analytics for business operations and enhancements. Further, platforms such as ONDC and Government e-Marketplace (GeM) increase the outreach of e-commerce capabilities.

Box XI.3: ONDC- Democratising Digital Commerce

Open Network for Digital Commerce (ONDC) is a pioneering initiative of the Department for Promotion of Industry and Internal Trade, aimed to democratise digital commerce and enable small businesses to capitalise on the benefits of digital commerce by creating a level playing field. The ONDC network is premised on the fundamentals of unbundling and making various components of digital commerce interoperable. ONDC started in January 2022 and rapidly expanded its twin domains of mobility and food and beverage to various domains like grocery, fashion, beauty and personal care, home and kitchen, on-network logistics, agriculture, gift cards, Farmer Producers Organisations (FPOs) and artisanal works.

Growth Map of ONDC

68 million Transactions since inception	1200+ Cities	65 Seller Applications	12 Logistic Service Providers
85% Small sellers	535,000+ Sellers	9 million Transactions per month	22 Buyer Applications

Update of Key Domains

- **Food and Beverage:** The network offers cost-effective benefits to restaurant partners, easing the burden of high fees charged by dominant aggregators. During Q4 FY24, there was an 18 per cent rise in orders owing to a strong network of over 95,000 restaurants

47 PIB release dated 06 December 2023, Ministry of Consumer Affairs, Food & Public Distribution. <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1983226>

48 Bain & Company. (13 December 2023). How India Shops Online 2023. <https://www.bain.com/insights/how-india-shops-online-2023/#>

and top brands serving 347 cities. Big names like Tata Neu, Dominos, and Ola have added food services to their apps, while others like MagicPin and PayTM focus on competitive pricing and special deals. The network is expanding its reach by training 350 street food vendors in Delhi-NCR and Lucknow.

- **Grocery:** In Q4 FY24, a growth of 52 per cent in grocery orders was achieved, facilitated by a network of 12,585 sellers catering to over 665 cities. Leading players such as Paytm and Otipy are investing in advanced digital storefronts and QR code technology. Collaborations with brands like Catch are enhancing product offerings, which currently include 6.3 million stock-keeping units (SKUs). Initiatives such as Kiko Live are actively digitising local Kirana stores, supported by major corporations like Hindustan Unilever Limited and ITC, who are advancing strategies to digitise 1.3 million Kirana stores on the ONDC platform.
- **Fashion, Beauty and Personal Care:** Q4 of FY24 witnessed a growth of 11 per cent on the back of more than 6400 sellers, offering an extensive choice of over 15 Lakh SKUs in about 900 cities. During the quarter, prominent brands such as Jockey, Kalyan Silk, Bella Vita and Emami Beauty joined the network.
- **Agriculture:** The ONDC Network holds promise in substantially improving the livelihoods of farmers and artisans. Around 5,700 FPOs have joined the network so far, with them collectively doing more than 23,000 transactions during Q4 of FY24. National Agriculture Market (eNAM) and Small Farmers' Agri-Business Consortium's (SFAC) digital applications have also been integrated into the network.

Digitally Empowered Inclusive Stories

- Sri Vidhya Handlooms in Kanchipuram, Tamil Nadu, transitioned to digital commerce via ONDC. This family-owned business expanded its reach to 54 cities and increased its product listings from 20 to 400 digital catalogues. Monthly revenues rose to nearly ₹2 lakh, compared to previous earnings of ₹10,000 to ₹20,000 on mainstream platforms. Lower commission rates on ONDC enhanced profitability.
- ONDC has empowered over a million women across 76 SHGs, including the Mann Deshi Foundation and Kudumbashree, facilitating over 1,200 orders. Innovative marketing and sustainable practices supported rural employment. The average order volume and revenue margins increased by 46 per cent.
- KalpNil Naturals in Maharashtra, produces cold-pressed oils and transitioned to ONDC in April 2023. With 13 SKUs listed, the brand expanded to 44 cities and generated ₹2.5 lakh in revenue by September 2023. The founder emphasised ONDC's role in boosting profit margins by eliminating intermediaries, significantly enhancing business growth.
- Namma Yatri, a ride-hailing platform integrated with ONDC, eliminates commissions and operates on a subscription fee. Launched in collaboration with the Auto Rickshaw Drivers' Union in Bengaluru, it increased driver earnings and reduced cancellation rates.

CHALLENGES AND OPPORTUNITIES

11.73 This section summarises the challenges and growth opportunities that cut across different segments of services, presented in different sections above.

- The rapid digitisation in the services sector necessitates a skilled workforce to keep pace with technological advancements. However, there is a gap in the availability of workers with relevant digital and high-tech skills. The Government has been focusing on skill development initiatives through programs like Skill India and the National Education Policy to equip the workforce with the necessary skills. Upskilling in the technology sector via an ecosystem fostered by government initiatives in collaboration with industry can help India emerge as a high-value partner specialising in areas such as cybersecurity, enterprise management, financial risk management and insurance.
- In recognition of the importance of logistics and transport services for economic activity, several initiatives have been undertaken to ease infrastructure bottlenecks, logistics costs, and regulatory compliances. Additionally, leveraging India's extensive coastline and river network for enhanced services such as port operations and inland waterways promises significant potential to streamline transportation routes, reduce costs, and improve efficiency. The Netherlands boasts Europe's densest network of inland waterways, covering approximately 6,000 kilometres of rivers and canals. These waterways serve various purposes, including drainage and navigation. Key commercial routes (Class IV and higher), totalling 2,200 kilometres, handle about 40 per cent of international freight movements and 20 per cent of domestic freight within the country.⁴⁹ Kerala's use of its backwaters for tourism, commerce, and transportation, particularly the Kochi Water Metro, which is expected to benefit 33,000 islanders, highlights the potential of inland waterways.⁵⁰ Adopting similar strategies nationwide can enhance India's inland water transport system, support sustainable growth, and ease congestion.
- Accessing finance can pose difficulties, particularly for small and medium enterprises operating in the services sector.⁵¹ Several initiatives, such as Mudra Yojana, Start-up India and Stand-up India, have been implemented to ease credit accessibility. Building on these efforts, focusing on streamlining loan processes, expanding the outreach of credit guarantee schemes, adopting alternative credit appraisal methods, and innovating supply chain financing can further augment credit flow to the sector. Governments at appropriate levels may also set up agencies to assist in project documentation and to improve the bankability of projects.
- The regulatory landscape in the services sector, which used to be complex, is undergoing positive transformations. Initiatives like GST simplification, Start-up India, and sector-specific policies such as the Real Estate (Regulation and Development) Act are fostering a more conducive business environment. Further enhancing the simplification of procedures

49 World Canals. Netherlands. Retrieved on 30 June 2024, from <http://worldcanals.org/english/netherlands.html#:~:text=About%206000km%20of%20rivers%20and,Rhine%20Canal%2C%20completed%20in%201953>

50 Kochi Water Metro. Retrieved on 30 June 2024, from <https://watermetro.co.in/about>

51 International Finance Corporation. Financing India's MSMEs - Estimation of Debt Requirement of MSMEs in India (Page 65). <https://www.ifc.org/content/dam/ifc/doc/mgrt/financing-india-s-msmes-estimation-of-debt-requirement-of-msmes-in-india.pdf>

through single-window systems, streamlining legal provisions, and digitising government processes at all administrative levels can significantly boost economic efficiency.

- Data privacy and cybersecurity have become critical concerns with the increasing digitisation of services. Given this, the Government is spearheading data protection laws and cybersecurity policies to safeguard consumer data and strengthen cybersecurity measures in the services sector. To further embrace technology with confidence, ensuring the adoption of strong security measures, compliance with privacy regulations, and fostering innovation in security technologies are essential.

CONCLUSION AND WAY FORWARD

11.74 Historically, India's services sector has thrived on low-cost offerings. The digitisation of services, coupled with appropriate policy nudges, kept progressively transforming the nature of service delivery almost irreversibly during the early part of the last decade. This trend accelerated post the pandemic. Another distinct pattern that emerged during the last three years is that the contact-intensive business and personal services—prominently trade, transport, real estate and their ancillary services — that underwent a steep decline during the pandemic are recovering, embedding greater technology and digital content in them. At the same time, India's services exports are diversifying beyond software to include Human Resources (HR), legal, and design services in line with emerging global demands. Thus, two significant transformations are reshaping India's services landscape: the rapid technology-driven transformation of domestic service delivery and the diversification of India's services exports.

11.75 The country is emerging as a hub for Global Capability Centres. Domestically, start-ups drive innovation, improving access to credit, raw materials, and markets. Aided by the deep technology ecosystem and the consistent policy push, many technology start-ups are digitising manufacturing and other services. The embedded service content of the non-service economic activities has increased significantly, as evidenced by the National Accounts Statistics. The post-production value addition in activities is also increasingly dependent on services like e-commerce, innovative packaging and advertisement and modern logistics services.

11.76 As India looks forward to creating millions of jobs by 2030, dovetailing this transformation in the demand-supply dynamics of services is pivotal to meeting the hiring requirements in the medium term. The emerging job demands in the services sector entail greater and more focussed skills. The World Economic Forum's report⁵² highlights an increasing focus on cognitive abilities (like complex problem-solving and creative thinking), digital literacy, and proficiency in AI and big data. This shift underscores the strategic imperative for businesses and the workforce to adapt to technological advancements and meet global market demands. Focus areas should include blockchain, AI, machine learning, Internet of Things, cybersecurity, cloud computing, big data analytics, augmented reality, virtual reality, 3D printing, and web and mobile development. Thus, the immediate task of the skilling programme in India is to

52 World Economic Forum. (2023). WEF Future of Jobs 2023 (Page 7). https://www3.weforum.org/docs/WEF_Future_of_Jobs_2023.pdf

plan and equip itself to meet these requirements adequately. A report by Capital Economics argues that AI could lead to a slowing down of India's services export growth, cutting it by 0.3-0.4 percentage points a year over the next decade.⁵³ This only underscores the importance of the relatively less skill-dependent tourism sector for employment generation. Therefore, public policy should pay particular attention to boosting the tourism sector. Governments at all levels and the private sector must work together to realise the sector's potential.⁵⁴

11.77 In the short run, tentative global economic outlook and commodity price uncertainties present a serious challenge to input costs and demand for services⁵⁵. Thus, sustaining positive demand trends and effectively managing rising costs and competitive pressures will be critical for the services sector's continued growth and resilience in the upcoming year. The post-pandemic dynamism shown by the economy and the services sector, in particular, should help transcend these uncertainties and challenges.

53 The Economist (24 June 2024). Will services make the world rich? <https://www.economist.com/finance-and-economics/2024/06/24/will-services-make-the-world-rich>

54 Hotel Association of India & Benori Knowledge. Vision 2047: Indian Hotel Industry (Page 29). <https://hotelassociationofindia.com/Vision%202047%20-%20March%2030.pdf>

55 As per the latest Supply and Use Tables for 2019-20 published by the Central Statistics Office, bulk of the inputs used in the production of services in India originate from commodity-producing (agricultural and industrial) sectors. So, pressure on commodity prices can significantly affect the input cost of services and, hence, their demand.

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INFRASTRUCTURE: LIFTING POTENTIAL GROWTH

The foremost among the responses initiated by the Union Government to overcome the pandemic-driven slowdown in the economy was increase in capital expenditure, aimed particularly at the creation of high quality physical and social infrastructure facilities. Keeping the momentum going over the last five years, capital expenditure of the Government has seen an almost three-fold increase in FY24, relative to FY20 levels. The major beneficiaries of this step-up are key foundational assets like roads and railways.

The burgeoning public investment has been complemented by a host of institutional and procedural reforms that facilitated project execution and timely issue resolutions. These include initiatives to enhance private sector participation through PPPs, facilitative measures like National Infrastructure Pipeline and Project Monitoring Group, de-bottlenecking procedures PM-GatiShakti, and novel instruments such as REITS and InvITs to ease the constraints on long-term finances required for infrastructure investments.

The Chapter shows that, with increased public investment over the last five years, India has witnessed significant expansion in physical and digital connectivity and social infrastructure including sanitation and water supply helping to improve quality of life of the people. At the same time, given the fiscal compulsions and consolidation plans of the Union and the State Governments, it is important that viable projects on the public-private participation mode emerge and get executed. Regular collection of sector-wise, source-wise information on infrastructure investment, bottom-up studies and aggregation of requirements of infrastructure and periodic assessment of utilisation of assets created will help making mid-course corrections on the country's developmental path.

INTRODUCTION

12.1. Creation of resilient, world-class infrastructure—physical, social, financial and digital—is a key plank of India's policy strategy to become ViksitBharat @ 2047. However, recent studies by the Asian Development Bank¹ and the World Bank² and recent estimates made by agencies like CRISIL³ have identified gaps in infrastructure investment in different sectors. Against this background, this chapter examines the recent developments in India's infrastructure space with a special focus on the progress achieved in FY24.

1 Meeting India's Infrastructure Needs, ADB, 2017

2 Financing India's Urban Infrastructure Needs World Bank, 2022

3 The Infrastructure Yearbook 2023 published by CRISIL

12.2. The Chapter is divided into six sections. Section II investigates the question of infrastructure financing within the limitations of data and stresses the need for greater balance between private capital and public investment, which will be constrained by the requirements of fiscal consolidation by the Government. Section III discusses sectoral developments, challenges and outlook. Discussion on financial infrastructure and on social infrastructures like health and education is not covered in this chapter as these subjects are discussed in chapters 2, 7 and 8 respectively. The fourth section shows the glimpse of the challenges and the opportunities across the infrastructure sector. Section V examines the efforts by the Government to reduce the bottlenecks in India's infrastructure sector. Section VI summarises the discussions and presents some important aspects of the way forward.

INFRASTRUCTURE FINANCING: THE PUBLIC EXPENDITURE PUSH

12.3. This section brings out two important facts about infrastructure financing in India. Firstly, despite many financial innovations in infrastructure financing in the recent years, capital expenditure by the Union and State Governments still have the central role in funding of large-scale infrastructure projects. Secondly, with the emergence of a number of new funding instruments and strategies, the infrastructure financing space has become complex, and, given the differential definitions and patterns followed in maintenance of statistics by different agencies, it is difficult to aggregate the total flow of funds for the creation of infrastructure in any given year.

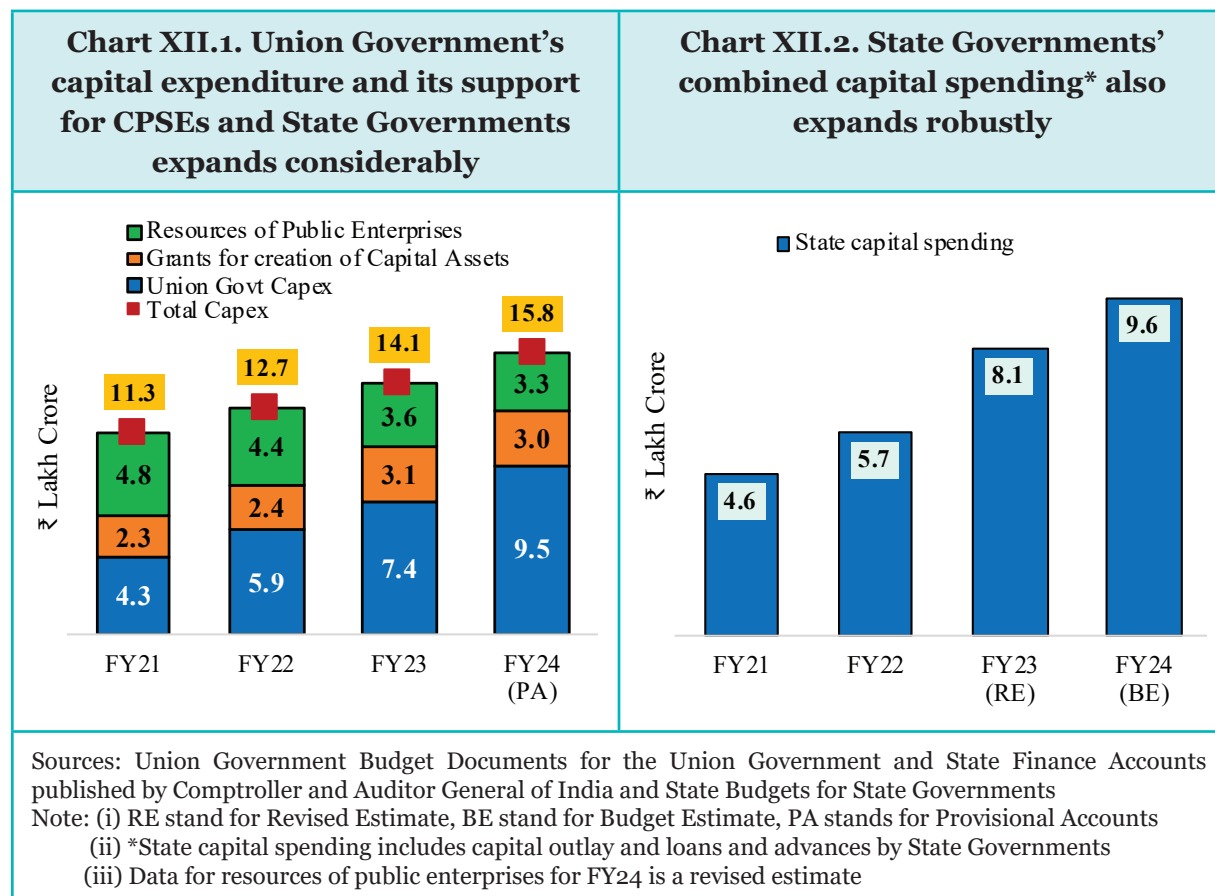
12.4. Even though budgetary capital expenditure cannot be equated to infrastructure spending⁴, the infrastructure thrust of the Government has led to an unprecedented increase in capital expenditure. Chart XII.1 shows that the capital expenditure of the Union Government increased by 2.2 times from FY21 to FY24 (PA) while that of the State governments increased by 2.1 times during the same period.

12.5. The capital expenditure of the Union Government broadly includes two components—the spending by its line departments and the gross budgetary support (GBS) given to the Central Public Sector Enterprises (CPSEs). The share of gross budgetary support to two key connectivity segments, i.e., Railways and National Highway Authority of India, in the total capital expenditure of the Union Government increased from 36.4 per cent in FY21 to 42.9 per cent in FY24 (RE). These two components of capital expenditure increased by 2.6 times from FY21 to FY24 (RE) in their absolute values.

12.6. The aggregate investible resources of the CPSEs consists of the GBS and the resources raised by CPSEs themselves. In order to optimise the combined borrowing cost of the Union Government and the CPSEs, the higher-cost borrowings of the two major infra-CPSEs—NHAI and Indian Railway Finance Corporation (IRFC) - were progressively reduced from FY21 to FY24. This is, to a large extent, reflected in the reduction in the own resources of the CPSEs in

⁴ Capital expenditure of the Government includes its spending to create any capital asset, which may not be created under a sector classified as infrastructure under the harmonious definition of infrastructure.

Chart XII.1. However, this reduction was more than offset by the expansionary GBS, thereby allowing investment in roads and railways to increase sizeably between FY21 and FY24.

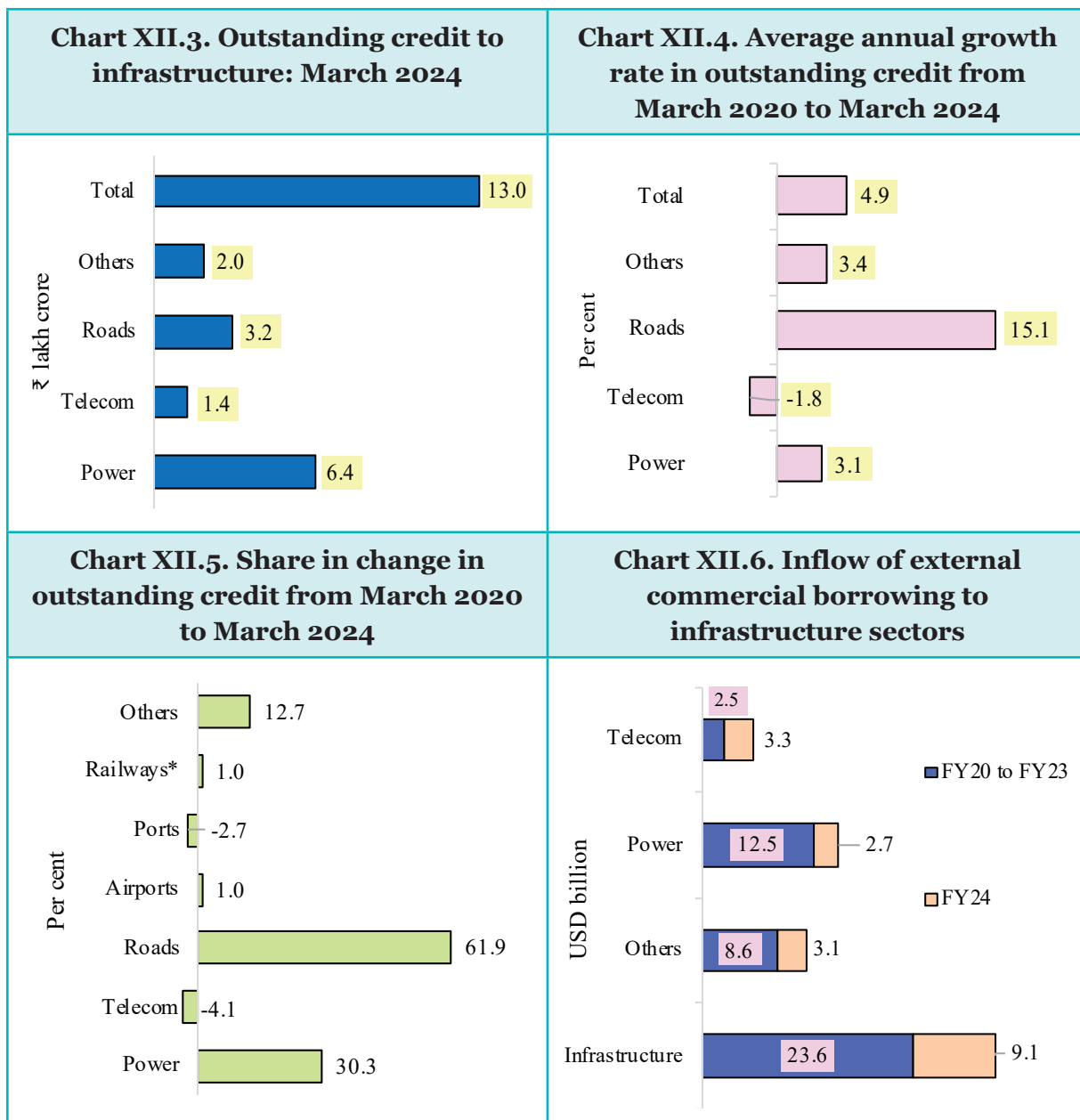


12.7. The support of the Union Government for capital expenditure of the State Governments and institutions increased by 31.6 per cent during FY21 and FY24. Further analysis of the capital expenditure of the State Governments is not possible as the data on the GBS by the State Government to the State Public Sector Enterprises (SPSEs) and the resources mobilised by SPSEs themselves are not available in a consolidated form.

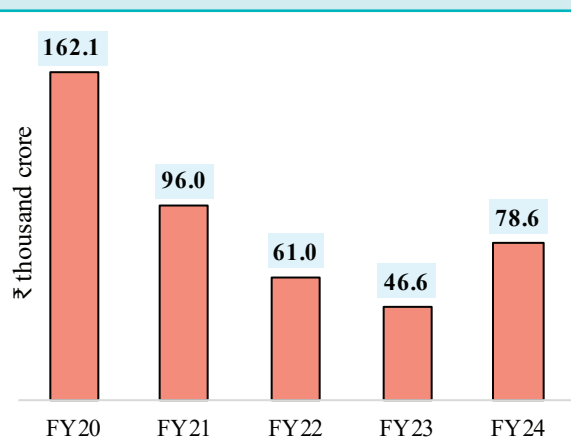
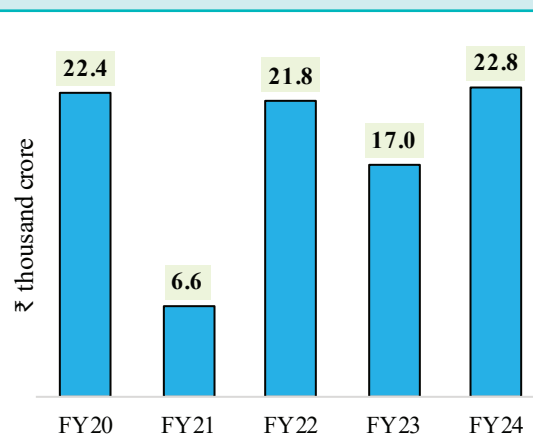
12.8. Charts XII.3 through XII.9 on important non-government sources of funding reiterates the fact that the recent infrastructure thrust in India, especially the surge in connectivity projects, has banked predominantly on public expenditure. The net flow of funds to infrastructure sectors through bank credit between March 2023 to March 2024 was only around ₹79,000 crore, much less than the GBS by the Union Government for either railways or roads. Charts XII.3 to XII.5 also show that the net flow of bank credit between March 2020 and March 2024 was concentrated in only a few sectors roads, airports and power. However, the credit growth to infrastructure sectors in FY24 recovered to 6.5 per cent, as against the growth of 2.3 per cent, in FY23.

12.9. The gross inflow of external commercial borrowings to infrastructure sectors also picked up to USD 9.05 billion in FY24, as against an average of USD 5.91 billion during FY20 to FY23.

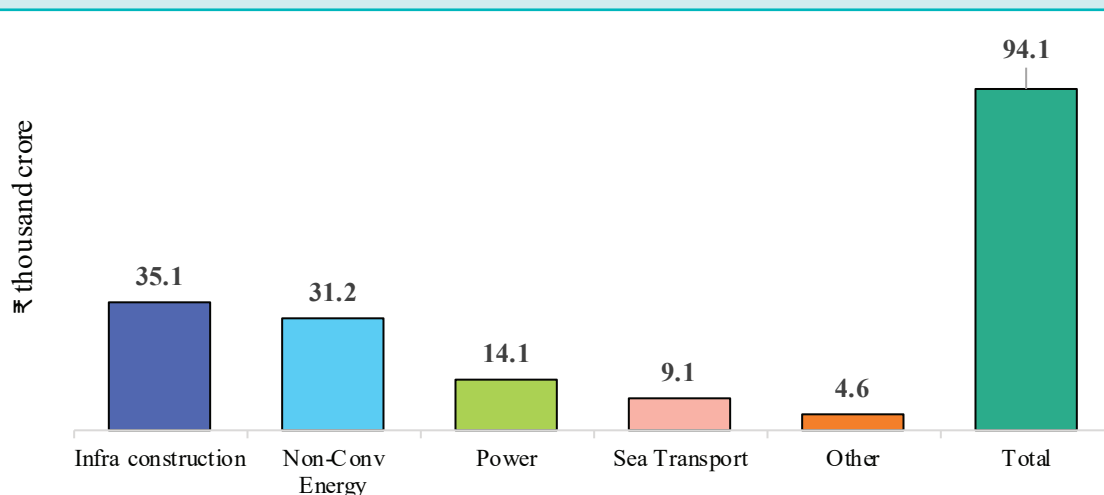
The resource mobilisation by infrastructure sectors⁵ through debt and equity issuances in the capital market was just over ₹1,00,000 crore during FY24. Real estate investment trusts (REITs) have raised ₹18,840 crore from year 2019 to 2024 while Infrastructure investment trusts (InvITs) raised a total of ₹1,11,294 crore in the last five years (2019-2024).



⁵ Note: Infrastructure sector has been considered based on the following sub-sectors - For Equity: Airport & Airport services, Civil Construction, Education, E-Learning, Healthcare Research, Analytics & Technology, Hotels & Resorts, Port & Port services, Power – Transmission, Power Distribution, Power Generation, Railway Wagons, Real Estate Investment Trusts (REITs), Real Estate related services, Residential, Commercial Projects, Road Assets–Toll, Annuity, Hybrid-Annuity, Road Transport, Ship Building & Allied Services, Shipping, Telecom – Infrastructure, Waste Management and Water Supply & Management. For Debt: Construction, Infrastructure (Power, Telecommunications, Roads, Airports, Ports, Railways and Other Infrastructure), Civil Construction, Energy, Healthcare, Hotels & Resorts, Real Estate related services, Road Assets - Toll, Annuity, Hybrid-Annuity, Telecom – Infrastructure and Residential, Commercial Projects

Chart XII.7. Funding of infrastructure sectors through domestic capital market debt sources**Chart XII.8. Funding of infrastructure sectors through equity issuance**

Sources: Data on credit and external commercial borrowings were sourced from the Reserve Bank of India. The data on domestic debt and equity issuances were sourced from Securities and Exchange Board of India
 Note: (*): In Chart XII.5, the reference to Railways does not include Indian Railways.

Chart XII.9. FDI equity inflows to infrastructure sectors during FY24**Table XII.1: Infrastructure-related FDI: key ratios**

FDI Equity Inflows to Infrastructure Sectors as Per Cent of GDP: FY20 to FY24	0.28
FDI Equity Inflows to Infrastructure Sectors as Per Cent of GDP: FY24	0.32
FDI Equity Inflows to Infrastructure Sectors as Per Cent of Total FDI Equity Inflows: FY20 to FY24	17.3
FDI Equity Inflows to Infrastructure Sectors as Per Cent of Total FDI Equity Inflows: FY24	25.6

Sources: Calculations Based on Data Received from Department of Industrial Policy and Promotion
 Note: The sectors considered include infrastructure construction, non-conventional energy, telecom, power, sea and air transport, railway components

Box XII.1: Major Mechanisms for fostering Public Private Partnership (PPP)**Public Private Partnership Appraisal Committee (PPPAC)**

- Apex body for appraisal of central sector PPP projects
- 77 projects with a total cost of ₹2.4 lakh crore were recommended from FY15 to FY24.

Viability Gap Funding (VGF)

- Assistance to financially unviable but socially/economically desirable PPP projects.
- 57 projects costing ₹64,926.1 crore were granted in-principle approval and 27 projects costing ₹25,263.8 crore were granted final approval from FY15 to FY24.
- Total VGF approval of ₹5,813.6 crore (both Union Government & State share) from FY15 to FY24.

India Infrastructure Project Development Fund Scheme

- Financial support for project development of PPP Projects
- Notified in November 2022 with a total outlay of ₹150 crore for three years from FY23 to FY25.
- 28 proposals have been approved.

Other Supportive instruments

- Reference guides for setting up state PPP units, PPP project appraisal, and project implementation mode selection have been made. Web-based toolkits, post-award contract management toolkit and contingent liability for project sponsoring authorities have been developed to help them in PPP structuring.

National Monetisation Pipeline (NMP)

12.10. NMP was announced in August 2021 on the principle of ‘asset creation through monetisation’ i.e., tapping private sector investment for new infrastructure creation. The aggregate monetisation potential under NMP was estimated at ₹6.0 lakh crore through core assets of the Government, over four-years from FY22 to FY25⁶. The pipeline contained more than 20 asset classes across 12 Ministries.

12.11. Ministries are proactively working on developing a pipeline and transactions have been undertaken in line with their strategic initiatives. During the first two years, i.e., 2021-22 and 2022-23, transactions aggregating to about ₹2.3 lakh crore in accruals or private investments were completed under the core asset monetisation programme. Further, in 2023-24, transactions aggregating to ₹1.51 lakh crore in accruals or private investments were completed, 1.55 times those achieved in 2021-22.

DEVELOPMENTS ACROSS INFRASTRUCTURE SECTORS

12.12. This section discusses the progress in key infrastructure sectors along with outlook and challenges, including covering physical connectivity, electricity, water and sanitation, urban

6 Asset Monetization Pipeline.pdf (niti.gov.in) -<https://tinyurl.com/mw3bdr74>

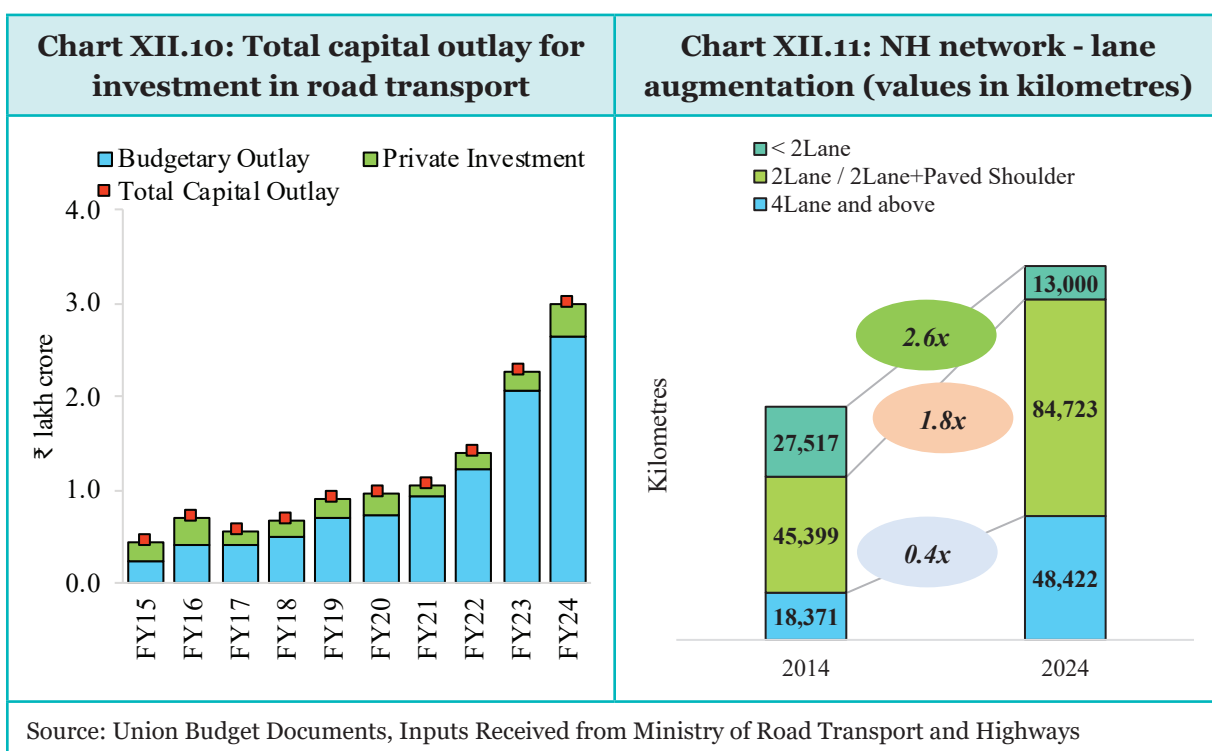
development, strategic and digital infrastructure. An attempt has been made to present only the details relating to infrastructure development in this chapter, leaving the discussion on infrastructure-related services to chapter on services.

Physical Connectivity Infrastructure

Road Transport

12.13. Strategic planning and step-up in public investment have resulted in the upgradation of the road network system into a resilient and efficient infrastructure. The capital investment by the Government and private sector rose from 0.4 per cent in FY15 to about 1.0 per cent of GDP (around ₹3.01 lakh crore) in FY24. The sector has attracted its highest-ever private investment in FY24 as the private sector capitalises on a conducive policy environment. Further, tapping on the private investment, funds garnered through asset monetisation in the roads sector have exceeded ₹1 lakh crore since FY19. Notably, the Government achieved its highest-ever asset monetisation revenues of ₹40,314 crore in FY24.

12.14. Over the last ten years, there has been significant progress in the development of national highways, increasing by 1.6 times from 2014 to 2024. The Bharatmala Pariyojana has significantly expanded the national highway network, increasing the length of high-speed corridors by 12 times and 4-lane roads by 2.6 times between 2014 and 2024. Further, the efficiency of highway construction has improved due to the systematic push through the corridor-based National Highway development approach. The average pace of NH construction increased by ~3 times from 11.7 km per day in FY14 to ~34 km per day by FY24. The remarkable improvement of the NH network has brought about substantial advancements in logistics efficiency. This is evidenced by the consistently rising India’s ranking in the World Bank’s ‘Logistics Performance Index, from 54 in 2014 and 44 in 2018, to 38 in 2023.



12.15. To further enhance logistic efficiency, Ministry of Road Transport & Highways (MoRT&H) has dedicated Multi-Modal Logistics Parks (MMLP). A total of six multimodal logistics parks (MMLPs) have been awarded until FY24, and ₹2,505 crore have been awarded for dedicated multimodal logistics parks (MMLPs) in FY24. Further, seven MMLPs are planned to be awarded in FY25.

Box XII.2: Key Initiatives Enhancing Road Connectivity

- Toll digitisation has reduced waiting time at toll plazas by nearly 16 times from 734 seconds to 47 seconds during 2014-24⁷. Free flow tolling through Automatic Number Plate Recognition/Global Navigation Satellite System has also been initiated.
- About 900 wayside amenities (WSAs) are planned to be established to provide world-class facilities and amenities. 322 WSAs have already been awarded out of which 50 are operational. In FY24 alone, 162 WSAs have been awarded.
- A proactive policy for NH maintenance has been adopted by engaging a contractual maintenance agency for each km of the entire NH network. Contractual maintenance is done either through performance-based maintenance contracts or short-term maintenance contracts. About 37,500 km of NH network has been taken up under these two maintenance contracts. Long-term maintenance contracts on developed NH stretches of about 20 years have also been undertaken through toll operate transfer and infrastructure investment trust mode.
- Sustainable raw materials and new-age construction techniques have been incorporated into highway development. 13.79 lakh tonnes of inert material from landfill sites have been used in urban extension road-II and spur of the Delhi-Mumbai expressway. Recycling of bitumen & asphalt is done during the brownfield upgradation of NHs.
- High-tech machinery and cloud-based data-driven construction have resulted in time and cost reduction.
- Under the “Parvatmala Pariyojana” to boost last-mile religious and tourist connectivity, six ropeway projects have been awarded. Bids have been received for another two projects.

12.16. **Outlook:** The development of expressways and corridors, along with the adoption of transformative initiatives to promote user convenience and environmental sustainability, have been the highlight of the recent road sector growth journey. However, continuous ribbon development along developed NHs is posing a challenge for the construction of a new parallel road/bypass. Now, the Government has started focusing on the development of access-controlled NHs. The Government is also targeting to make all NHs a minimum of two lanes with paved shoulders standards. Another challenge is the slow onboarding of digital land records, leading to land acquisition delays. This is further impacted by delays in approvals for forest and other environmental clearances.

7 PIB, June 2023 by Ministry of Road Transport & Highways - <https://tinyurl.com/yh6m7nrx>

Box XII.3: Key Initiatives for Road Development

Development of Rural Roads - Pradhan Mantri Gram Sadak Yojana (PMGSY)

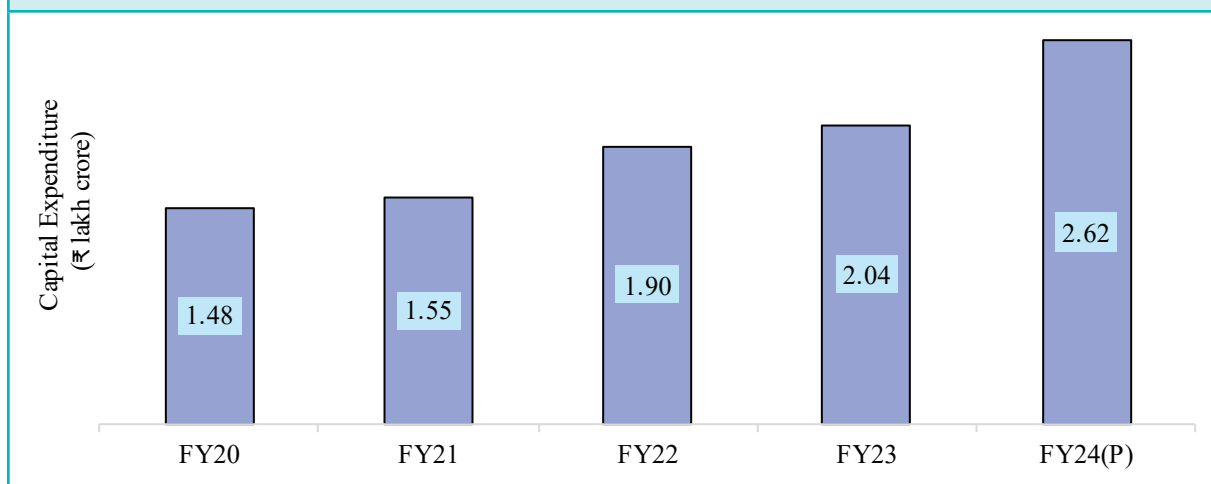
- PMGSY-I launched in December 2000, to provide connectivity through an all-weather road with necessary culverts and cross-drainage structures to eligible unconnected habitations in rural areas.
- PMGSY-II launched in 2013 to upgrade 50,000 km of selected through-routes and major rural links (MRLs) in various states and union territories.
- In 2016, a road connectivity project for strategically important roads in left-wing extremism affected areas was launched as a separate vertical under PMGSY.
- PMGSY-III launched in 2019 for consolidation of 1,25,000 km through routes and MRLs connecting habitations, inter-alia, to gramin agricultural markets, higher secondary schools, and hospitals.
- A total of 8,29,409 km of road length has been sanctioned under PMGSY out of which, 7,63,308 km of road length has been completed as on 18th June 2024 under various interventions/verticals of PMGSY at an expenditure of ₹3.23 lakh crore (including state share).
- 99.6 per cent of the targeted habitations under PMGSY-I have been provided connectivity.

Development of Industrial Corridors

- The Government is developing 11 industrial corridor projects as part of the national industrial corridor programme in a phased manner. These include industrial corridors connecting Delhi-Mumbai, Chennai-Bengaluru, Amritsar Kolkata, East Coast and Vizag Chennai Corridor, Bengaluru-Mumbai, Extension of CBIC to Kochi via Coimbatore, Hyderabad-Nagpur, Hyderabad-Warangal, Hyderabad-Bengaluru, Delhi-Nagpur and Odisha Economic Corridor.
- The programme is aimed at providing multi-modal connectivity with complete “plug and play” infrastructure until the plot level with resilient and sustainable future-ready cities.
- A total of 308 Plots (1,789 acres) have been allotted until March 2024 in four cities.
- At present, about 2,104 acres of developed industrial land and 2,250 acres of commercial/residential/ other land use are readily available for allotment.

Rail Transport

12.17. Indian Railways, with over 68,584 route km (as of 31st March 2023) and 12.54 lakh employees (as of 1st April 2024), is the fourth largest network in the world under single management. Capital expenditure on Railways has increased by 77 per cent over the past 5 years (₹2.62 lakh crore in FY24) with significant investments in the construction of new lines, gauge conversion, and doubling.

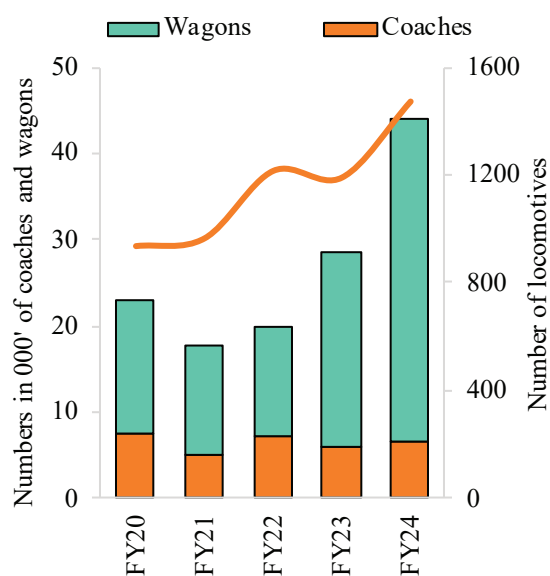
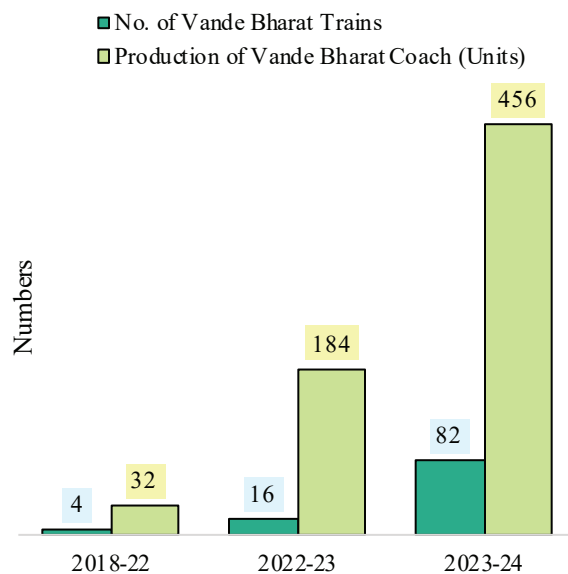
Chart XII.12: Capital expenditure on railways

Source: Ministry of Railways
Note: P stands for Provisional

Box XII. 4: Initiatives for Railway Enhancement

Amrit Bharat Station Scheme	Mumbai-Ahmedabad High Speed Rail (MAHSR) project	Dedicated freight corridors (DFCs)
<ul style="list-style-type: none"> Launched in August 2023 for development of stations on a continuous basis. Involves preparation of master plans and its phased implementation to improve amenities, building improvements, multimodal integration, and sustainability. 1,324 stations have been identified for upgradation so far. 	<ul style="list-style-type: none"> Under this 508 Km project, executed with co-operation from Govt. of Japan, land acquisition and civil conduct award have been completed. Overall physical progress of 41.7 per cent has been achieved and financial expenditure of ₹59,291 crore was incurred until 31st March 2024. 	<ul style="list-style-type: none"> Two DFCs are under implementation namely the eastern DFC with route length of 1,337 kilometre and the western DFC with route length of 1,506 kilometre. By the end of FY24, 96.1 per cent of the total DFC route length has been completed.

12.18. Railways achieved its highest-ever production for both locomotives and wagons in FY24. Fifty one pairs of Vande Bharat have been introduced until March 2024. The fast pace of infrastructure augmentation has been the result of a substantial increase in financial allocation along with close project monitoring and regular follow-up with stakeholders for expeditious land acquisition and clearances.

Chart XII.13: Year wise production of coaches, locomotive and wagons**Chart XII.14: Vande Bharat trains and production of coaches (2018-19 to 2023-24)**

Source: Ministry of Railways

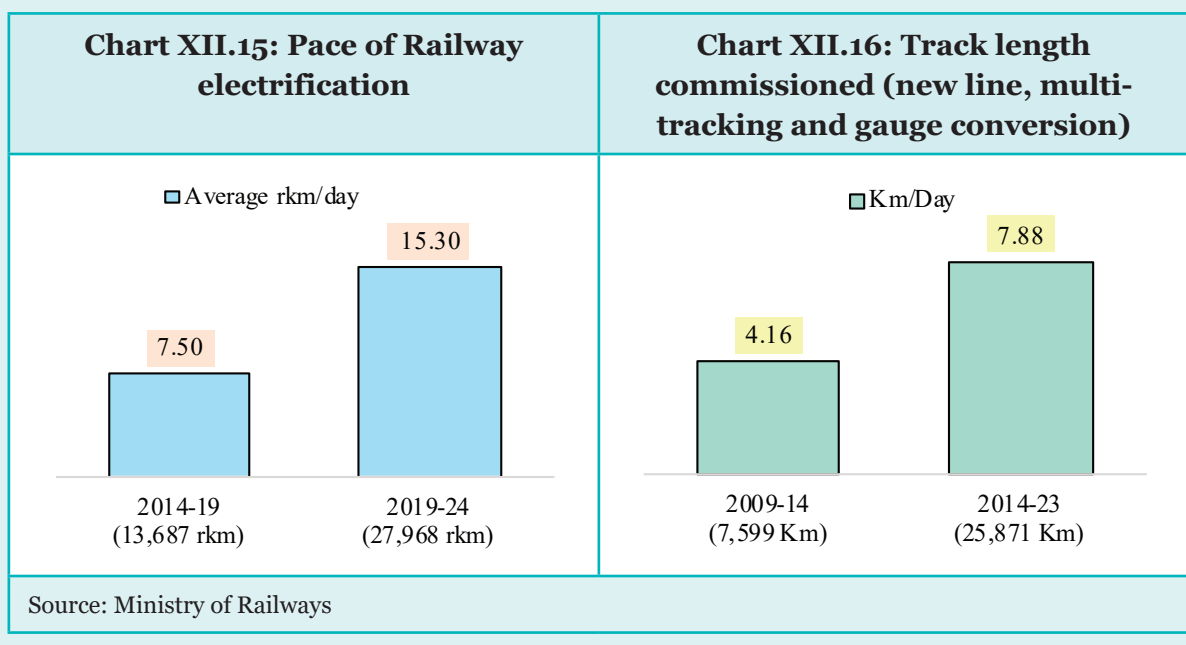
12.19. High-speed, long-distance Vande sleeper trainset coaches having features like quick acceleration, diffused lighting, automatic doors and Global Positioning System-based passenger information system are under development. Railways is also planning to introduce Vande metro trainset coaches with features such as sealed wider gangways, centrally controlled automatic sliding doors, CCTVs for safety and surveillance, route map indicator, passenger information & infotainment system, fire detection system and aerosol-based fire suppression system. The first lot is expected to be turned out in FY25.

12.20. Railways has taken several initiatives for providing clean environment in and around railway stations and trains, such as replacement of conventional toilets with bio-toilets on coaches leading to clean tracks, segregation of bio-degradable/non bio-degradable waste, solid waste management and discouraging use of single use plastic.

Box XII. 5: Key Initiatives in the Railway Sector

- GatiShakti Multi-Modal Cargo Terminal (GCT) is being developed by private players on the railway and non-railway land, based on demand from industry and the potential of cargo traffic. 77 GCTs have been commissioned and in-principle approval have been issued for 186 locations on non-railway land as of 31st March 2024.
- Launched 'Virtual Aggregation Platform' for online booking of parcel space allowing various cargo transporters to have live visibility of demand.
- Implemented a policy framework to establish 50 Pradhan Mantri Bhartiya Janaushadhi Kendras in railway station premises.

- Mechanical signalling is being placed with electrical/electronic interlocking systems. So far, eight zones have become free from mechanical signalling.
 - Electronic interlocking (EI) systems have been provided at 443 stations during FY24. Until 31st March 2024, EI has been provided at 3,424 stations
 - Kavach as automatic train protection (ATP) system has been deployed on 1,465 route kilometres (RKM) on south central railways.
 - Automatic Block Signalling (ABS) a proven low-cost signalling solution has been provided on 582 route km during FY24. Until 31 March 2024, ABS has been commissioned on 4,431 RKM on high-density network routes.
- Under the Mission 100 per cent Electrification Programme, electrified network of IR has been extended to 63,456 km (96.4 per cent). In past five years (2019-24) electrification has progressed at a pace of about 5,594 RKM per year.



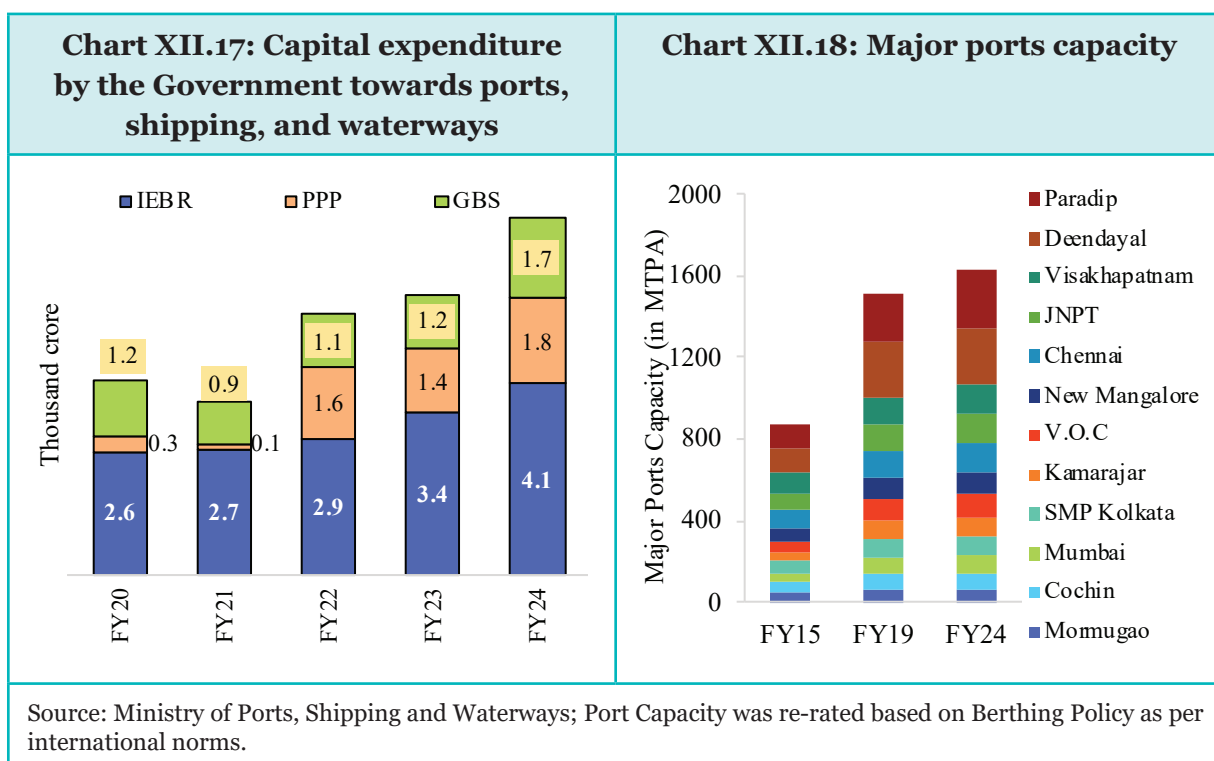
12.21. **Outlook:** The key focus areas for Railways include fast capacity augmentation, modernisation of rolling stock and maintenance, improving quality of services and energy efficiency. In line with this, investments are prioritised in areas like dedicated freight corridors, high-speed rail, modern passenger services like Vande Bharat, Amrit Bharat Express, Aastha Special Trains, high-capacity rolling stock and last-mile rail linkages. Projects for three major corridors viz. (1) High-traffic density corridors, (2) Energy, Mineral and Cement Corridors and (3) Rail Sagar (port connectivity) corridors are also planned to reduce logistics cost and carbon footprint. Railways has also planned to reduce its carbon footprint primarily through sourcing of its energy requirements through renewable energy sources. The expected requirement of installation of renewable capacity by 2029-30 is around 30 Giga Watts. Other strategies include shifting from diesel to electric traction, promotion of energy efficiency and afforestation. Carbon emission by 2029-30 as per business-as-usual mode is estimated to be 60 million tonnes⁸. As

8 PIB dated 07th Oct 2022, Ministry of Railways - <https://tinyurl.com/89u3brm4>

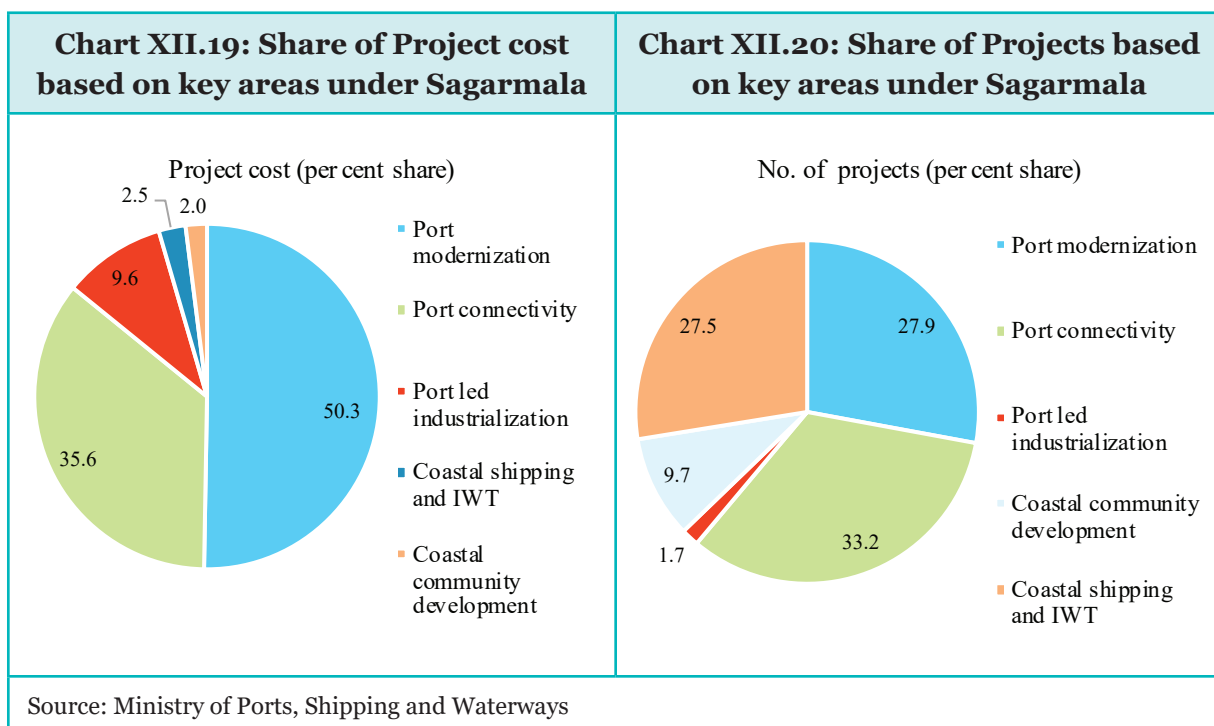
of March 2024, ~231 Mega Watt (MW) of solar plants (both on Rooftops and on land) and about 103 MW of wind power plants have been commissioned. Further, about 5,750 MW of renewable capacity has also been tied up.

Water Transport

12.22. Indian ports are rapidly expanding capacity to meet growing trade. Major port capacity has nearly doubled since 2014. Improved connectivity through coordinated planning under the PM Gati-Shakti National Master Plan and a focus on public-private partnerships have enhanced India’s maritime competitiveness globally. India’s rank in the International Shipments category in the World Bank Logistics Performance Index has improved to 22nd in 2023 from 44th in 2014. Further, policy reforms and the induction of new technology have enhanced port efficiency and productivity. As mentioned in chapter 4 on the External Sector, the container turnaround time has dropped by 50 per cent between 2014 and 2023-24. The union capital expenditure towards ports, shipping and waterways sector has grown by 27 per cent between FY23 and FY24.



12.23. Under the Sagarmala national programme launched in 2015, a total of 839 projects worth ₹5.8 lakh crore have been undertaken across five key areas of Port modernisation & fresh development, connectivity enhancement, port-led industrialisation, coastal community development and coastal shipping and inland water transport. Under this programme, 262 projects worth ₹1.4 lakh crore are completed, while 217 projects worth ₹1.65 lakh crore are under implementation and 360 projects worth ₹2.7 lakh crore are under development.



Box XII. 6: Key Initiatives in the Ports

- Major Port Authorities Act, 2021 with a focus on decentralised decision-making, professionalism, and PPP models has enhanced efficiency and improved governance of major ports.
- ‘Harit Sagar’- Green Port guidelines were launched in May 2023 - under which four major ports are already generating more renewable energy than their demand.
- ‘Sagar Aankalan’, a national benchmarking of Indian ports performance applicable to all Indian seaports was released in February 2024.
- A world-class National Maritime Heritage Complex being built at Lothal will showcase a vast collection of maritime artefacts and India’s rich maritime history.
- Discovery campus of the National Technology Centre for Ports, Waterways and Coasts was inaugurated at IITM, Chennai.
- Development of an all-weather greenfield deep draft major port at Vadhavan in Maharashtra has been approved by the Cabinet. The total project cost, including land acquisition component, is ₹76,220 Crore. The project will be constructed by Vadhavan Port Project Limited, an SPV formed by Jawaharlal Nehru Port Authority and Maharashtra Maritime Board. This will include core infrastructure, terminals and other commercial infrastructure in PPP mode. The project will create a cumulative capacity of 298 million metric tonnes per annum⁹.

⁹ Cabinet PIB dated 19 June 2024 - <https://tinyurl.com/2ydtzb4k>

12.24. **Island Development:** In Amrit Kaal Vision 2047, island development will be a key focus for coming years. Under the Maritime India Vision 2030, Andaman & Nicobar islands and Lakshadweep Islands are planned to be developed for tourism and other initiatives in a phased manner. Andaman Lakshadweep Harbour Works will develop the port infrastructure required to meet the growing demand and also provide technical support to local port departments for operations. Shortlisted islands in Lakshadweep, Andaman and Nicobar and Gujarat are proposed to be developed over the next decade around the themes of eco-tourism, ship repair, seaplane building and repair, maritime training institute, free trade zones and bunkering terminals. Such developments can further be expanded to other islands in the country¹⁰.

12.25. **Ship building, repair and recycling:** Shipbuilding financial assistance policy scheme was launched to offer financial support to Indian shipyards for shipbuilding contracts signed between 1 April 2016 and 31 March 2026. A total of 39 shipyards have registered, and 18 shipyards have utilized the benefits. In May 2023, the Udupi Cochin Shipyard Limited, a wholly owned subsidiary of Cochin Shipyard Ltd., flagged off five deep-sea tuna long liner cum gill netter fishing vessels built under the Pradhan Mantri Matsya Sampada Yojana. An International Ship Repair Facility was inaugurated at Cochin Shipyard Ltd (CSL) in January 2024. The new dry dock allows building larger ships, including future aircraft carriers, and repairs.

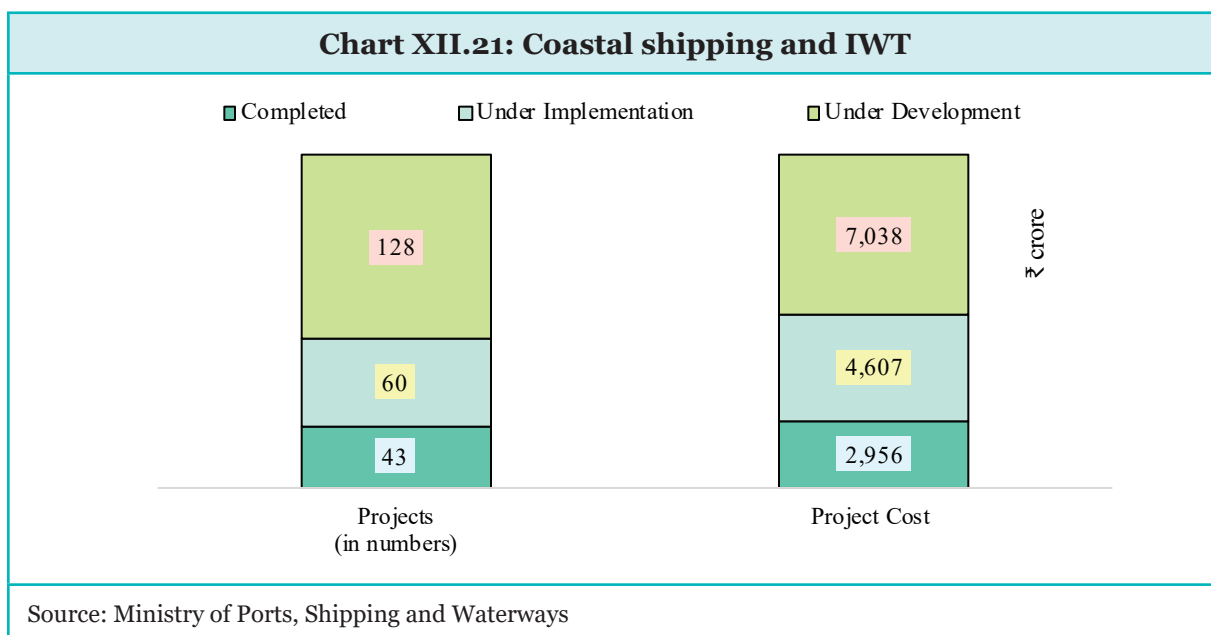
12.26. The Recycling of Ships Act, 2019 and Rules thereunder aim to set international standards for ship recycling and ensuring safe and environmentally sound practices subsequent to accession to the Hong Kong International Convention. Under the Act, the Government has also notified the Directorate General of Shipping as National Authority for Recycling of Ships with authority to administer, supervise and monitor all activities relating to ship recycling.

12.27. **Outlook:** The India's Maritime Vision 2030 outlines over 150 initiatives to improve ports, shipping, and inland waterways and envisions investments of ₹3-3.5 lakh crore. The Maritime Amrit Kaal Vision 2047 outlines over 300 initiatives across 11 key areas to drive growth and development in India's coastal regions. Its vision aims to reduce the average vessel turnaround time (containers) from 25 hours in 2020 to less than 20 hours in 2030. Likewise, it also aims to increase the average ship daily output (gross tonnage) from 16,000 in 2020 to more than 30,000 in 2030.

Coastal Shipping and Inland Water Transport

12.28. With the focus of the Government to foster coastal shipping, the gross tonnage through this mode has increased from 1.19 million GT as on 1, April 2014 consisting of 846 vessels to 1.72 million GT with 1039 vessels as on 1, April 2024.

¹⁰ Ministry of Ports, Shipping and Waterways PIB dated 24 Nov 2023 - <https://tinyurl.com/ytfb3jy9>



12.29. India has a large endowment of rivers, canals, and other waterways, with a total navigable length of around 14,500 km¹¹. The notification of the Inland Vessels Act 2021, was aimed at replacing the over 100 years old Inland Vessels Act of 1917, making the legislative framework user-friendly.

12.30. Capital expenditure by the Inland Waterways Authority of India (IWAI) for FY24 was ₹1010.5 crore. Based on feasibility and detailed project reports prepared for 106 new National Waterways (NWs), technical interventions have been planned for safe navigation and shipping on technically viable waterways. Over 63 per cent of the Jal Marg Vikas Project on NW-1 has been completed as of March 2024. Phase-I development of NW-3, NW-4, NW-5 & 13 new NWs was approved at a cost of ₹267 crore for 2025-2026.

12.31. The Indo Bangladesh Protocol (IBP) route, developed jointly by India and Bangladesh at an estimated cost of ₹305.84 Crore, provides an alternate connectivity for all North-eastern states from Guwahati and Jogighopa to Kolkata and Haldia ports. With the initiatives taken in last 9 years, the cargo handled via IBP route has increased significantly.

Civil Aviation

12.32. India is amongst the fastest-growing aviation markets globally. The Government has a capital expenditure plan of more than ₹26,000 crore for the period FY20 to FY25 to develop, upgrade and modernise airports to meet international standards. Out of the planned expenditure, the Airport Authority of India (AAI) has achieved around ₹23,000 crore during FY20 to FY24. PPP and other airport operators have incurred an amount of around ₹49,000 crore during the same period, taking the total capital expenditure of around ₹72,000 crore in the airport sector during the last 5 years.

¹¹ As per Chapter 15, Report of the National Transport Policy Committee 1980) India's navigable inland waterways extend nearly 14,500 kilometers, comprising a variety of river systems, canals, backwaters, creeks, and tidal inlets. These include all waterways navigable by country boats. Source: Government of India, Ministry of Shipping & Transport, Report of the Committee on National Waterways, 1974, p. 58"

12.33. 21 Greenfield airports were accorded in-principle approval, out of which 12 airports have been operationalised. During FY24, new terminal buildings at 21 airports have been operationalised which has led to an overall increase in passenger handling capacity of these airports by approximately 62 million passengers per annum. During last seven years, after commencement of Ude Desh ka Aam Nagrik (UDAN) Regional Connectivity Scheme (RCS), 1,390 valid awarded routes have been allotted to various airlines. Out of this, 579 RCS routes connecting 85 unserved and underserved airports have been operationalized.

Box XII. 7: New Segments – Drones, Leasing and MRO

- Drones offer vast benefits across sectors like agriculture, healthcare, disaster relief, surveillance, and defence. The Government introduced liberalized drone rules in 2021. Other measures include publishing drone airspace maps, implementing a PLI scheme, and introducing a drone certification scheme. Key progress includes the establishment of 109 training organisations and the issuance of 10,603 remote pilot certificates, 22,943 unique identification numbers for registered drones, and 67 DGCA-approved Type-Certificate for drone models.
- The Government is promoting aircraft leasing through the International Financial Services Centre (IFSC) at GIFT City. More than 28 aircraft lessors have already registered, which have together leased more than 20 aircraft and 49 aircraft engines. Recently, Air India has commenced leasing of its wide body aircrafts from the IFSC zone and other airlines are also in process of establishing leasing company in IFSC.
- Realising the potential of the MRO industry in India, the Government has introduced several policies and regulations to bring India's MRO sector at par with global peers. MROs in India have enhanced their capacities in traditional segments such as airframes and the industry is branching to other MRO segments such as engines in collaboration with global OEMs. After the announcement of the National Civil Aviation Policy (NCAP-2016), the number of MROs in India has increased to 147, from 114 in 2016. The setting up of new MROs has increased employment in the sector. More airports are building MRO facilities to add capacity thereby addressing infrastructure constraints.

Outlook: The number of airports in India has more than doubled since 2014. However, there is need to augment this capacity by adding more airports as well as expansion/upgradation of existing airports in the next five years. In spite of impressive growth in the last decade in the Indian aviation market, there is still largely untapped potential. At around 0.13 air trips per capita¹², the current passenger air traffic is a fraction of India's potential. MRO and skill development will fuel the growth of the sector further. Initiatives such as the International Aviation Hub Strategy and engagements with global bodies signal India's intent to emerge as a key player in the global aviation landscape. For India to take a leadership position in aviation, focus is required on improving the efficiency and viability of airlines while ensuring environmental sustainability. A large proportion of Indian international traffic for the long

¹² Ministry of Civil Aviation

haul goes through connectivity hubs in the Middle East and Southeast Asia. There is also need to provide adequate long-haul connectivity from India by strengthening Indian airlines.

Energy Infrastructure

Power Sector

12.34. Power transmission in India is connected into one grid running on one frequency with the inter-regional capability of transferring 1,18,740 megawatts (MW). It is emerging as one of the largest unified electricity grids in the world. Until 31 March 2024, transmission systems have expanded to 4,85,544 circuit kilometre of transmission lines and 12,51,080 mega volt amp (MVA) of transformation capacity.

12.35. The peak electricity demand increased by 13 per cent to 243 GW in FY24. The Government of India has accelerated its efforts to enhance the sector and meet the continuously rising demand for electricity in the country. Between FY23 and FY24, the maximum rise in electricity generation was recorded in renewable energy resources for utilities.

Box XII. 8: Revamped distribution sector scheme (RDSS)

RDSS was launched in 2021 to help distribution companies improve operational efficiencies and financial sustainability by providing result-linked financial assistance to strengthen supply infrastructure based on meeting pre-qualifying criteria and achieving basic minimum benchmarks.

- RDSS has an outlay of around ₹3.04 lakh crore from FY22 to FY26¹³ which includes an estimated Government budgetary support of around ₹0.98 lakh crore.
- RDSS aims to reduce aggregate technical & commercial losses to 12-15 per cent by FY25¹⁴, reduce the Average Cost of Supply and the Average Revenue Realized gap to zero by FY25 and improve quality, reliability, and affordability of power supply to consumers through a financially sustainable and operationally efficient distribution sector.
- Under RDSS, 19.79 crore prepaid smart meters, 52 lakh distribution transformer meters and 1.88 lakh feeder meters have been sanctioned.

12.36. A total of 2.86 crore households have been electrified since the launch of the Saubhagya period in October 2017 under various schemes. Further, the implementation of Electricity (late payment surcharge and related matters) Rules, 2022 have given relief to the DISCOMs, as well as electricity consumers and generating companies. Since implementation, as of 2nd April 2024, total bills amounting to ₹8.1 lakh crore have been settled against the total billed amount of ₹8.7 lakh crore from May 2022 (excluding EMI Payments against legacy dues and including disputed invoices).

13 PIB dated 11 Aug 2023, Ministry of Power - <https://tinyurl.com/yc6e8wev>

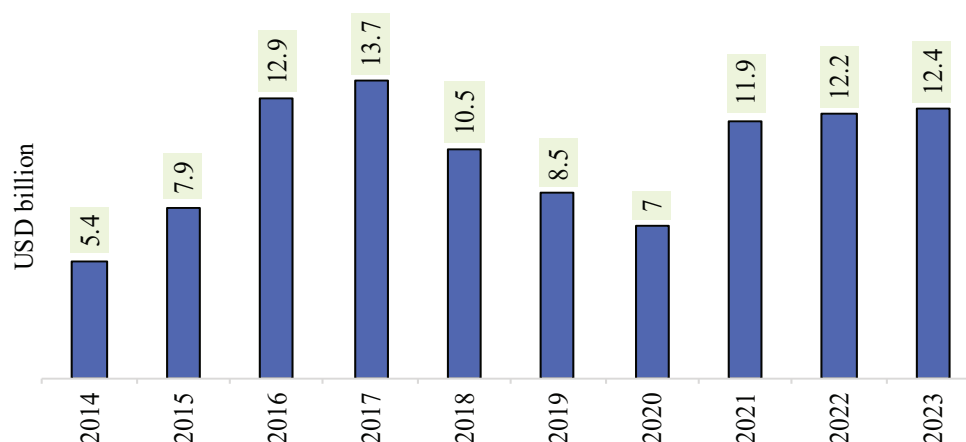
14 PIB dated 11 Aug 2023, Ministry of Power - <https://tinyurl.com/yc6e8wev>

Box XII. 9: Some Key Initiatives in the Power Sector

SAMARTH Mission	One Sun, One World, One Grid Initiative
<ul style="list-style-type: none"> Launched in 2021, the Sustainable Agrarian Mission on Use of Agri-Residue in Thermal Power Plant (SAMARTH) has a full-time mission directorate to coordinate and monitor implementation. Biomass co-firing in NCR thermal power plants has reached 1.68 per cent; efforts are underway to take it up to 5 per cent. 	<ul style="list-style-type: none"> A task force is studying the feasibility of interconnection of regional grids viz. Southeast Asia, South Asia, Middle East, Africa and Europe for exchange of renewable power. Presently, discussions are going on with Saudi Arabia, UAE, Sri Lanka, Myanmar, Singapore, etc.
UJALA Scheme	Street Lighting National Programme
<ul style="list-style-type: none"> Unnat Jyoti by Affordable LEDs for ALL (UJALA), launched in 2015, LED bulbs, LED tube lights and energy-efficient fans are sold to replace conventional and inefficient variants. According to the Ministry of Power, this has resulted in an estimated energy savings of 48.42 billion kWh per year with avoided peak demand of 9,789 MW and GHG emission reduction of 39.30 million tonne CO₂ per year, and annual monetary savings of ₹19,335 crore in consumer electricity bills. 	<ul style="list-style-type: none"> This programme was launched in 2015 to replace conventional streetlights with smart and energy-efficient LED streetlights. Over 1.31 crore LED streetlights have been installed so far. According to the Ministry of Power, this is estimated to have resulted in estimated energy savings of 8.80 billion kWh per year with avoided peak demand of 1,467 MW and GHG emission reduction of 6.06 million tonnes CO₂ per year and estimated annual monetary savings of ₹6,162 crore in electricity bills of municipalities.

Renewable Sector

12.37. India submitted its updated nationally determined contributions to the United Nations Framework Convention on Climate Change on 26 August 2022 and committed to achieve about 50 per cent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030. The Ministry of New and Renewable Energy is working towards achieving 500 Giga Watt (GW) of installed electricity capacity from non-fossil sources by 2030. A total of 190.57 GW of renewable energy (RE) capacity has been installed in the country as of 31 March 2024. The share of RE in the total installed generation capacity in the country stands at 43.12 per cent.

Chart XII.22: Investment in Renewables

Source: REN21. Renewables 2024 Global Status Report

12.38. The clean energy sector in India saw new investment of ₹8.5 lakh crore (USD 102.4 billion) between 2014 and 2023¹⁵. The RE sector is expected to attract investments of about ₹30.5 lakh crore in India between 2024 and 2030¹⁶. This would create significant economic opportunities across the value chain. The RE sector received approximately USD 17.88 billion as FDI from April 2000 until March 2024¹⁷.

Box XII.10: Major Programmes, Projects, and Initiatives in the Renewable Energy Sector

- Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM): As of 31 March 2024, 166 MW decentralized solar capacity has been installed and 3.26 lakh agricultural pumps have been solarized under the Scheme.
- Production Linked Incentive Scheme for National Programme on High Efficiency Solar Photovoltaic (PV) Modules: To achieve manufacturing capacity of GW scale in High Efficiency Solar PV modules with outlay of ₹24,000 crore. As of 31 March 2024, four manufacturers have started manufacturing of solar PV modules.
- Solar Parks Scheme: To provide solar power developers with a plug and play model, by facilitating necessary infrastructure along with all statutory clearances. Scheme has a sanctioned capacity of 39.7 GW for the development of 56 Solar Parks in 13 States. Solar projects of capacity 11.59 GW have been commissioned in these parks and the remaining capacity is at various stages of implementation.
- PM - Surya Ghar: Muft Bijli Yojana: Aimed to install rooftop solar plants in one crore households with a total financial outlay of ₹75,021 crore and to be implemented until FY27. This is expected to enable an installation of around 30 GW of residential rooftop solar capacity and 40-45 GW of overall rooftop solar capacity addition by FY27.

¹⁵ REN21. Renewables 2024 Global Status Report- Renewables in Energy Supply

¹⁶ Investment Estimates by Indian Renewable Energy Development Agency

¹⁷ FDI Inflow Factsheet, Department for Promotion of Industry, and Internal Trade (DPIIT), Govt. of India

- **CPSU Scheme Phase-II (Government Producer Scheme):** Aimed at setting up grid-connected solar PV power projects by PSUs and the Government organisations, using domestically manufactured solar PV cells and modules, with VGF support for self-use or use by the Government or Government entities. Out of the 8.2 GW capacity of solar PV power plants, about 1.66 GW capacity has been commissioned and the balance is under implementation as of 31 March 2024.
- **Wind Power:** Wind energy is led by indigenous wind power industry and strong project ecosystem, operation capabilities and a manufacturing base of 18 GW per annum¹⁸. As of 31 March 2024, the wind power installed capacity has grown by about 2.1 times during the past 10 years to about 45.89 GW. As per REN21 Report, India stands fourth in wind power installed capacity in the world¹⁹.
- **New Solar Power Scheme (for Particularly Vulnerable Tribal Groups (PVTG) Habitations/Villages:** Launched on 04 January 2024 under the Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan for electrification of one lakh un-electrified PVTG households located in 18 States and one Union Territory by provision of off-grid solar systems where electricity supply through grid is not techno-economically feasible.
- **Green Energy Corridor (GEC) projects:** Initiated to facilitate renewable power evacuation and reshaping of the grid for future requirements. GEC-I is under implementation in eight States with cumulative achievement of 9,111 circuit kilometer (ckm) transmission lines and 21,303 MVA substations. GEC-II is under implementation in seven States.
- **Bio Energy Programme:** The National Bioenergy Programme notified in November 2022 to be implemented from 1 April 2022 to 31 March 2026 in two phases. As of 31 March 2024, installed capacity of biomass power and cogeneration projects was about 9.4 GW (grid-connected) and 0.92 GWeq. (off-grid), waste to energy projects capacity was 249.74 MW (grid-connected) and 336.06 MWeq. (off grid). Under biogas programme, about 51.04 lakhs of small biogas plants and 349 medium size biogas plants (10.6 MWeq.) have been installed.
- **National Green Hydrogen Mission:** Approved in January 2023 with outlay of ₹19,744 crore. The mission targets to achieve about 5 million metric tonne (MMT) of annual Green Hydrogen production capacity, associated renewable energy capacity of about 125 GW, ₹8 lakh crore in total investments, and 50 MMT CO₂ annual emission expected to be averted by year 2030.

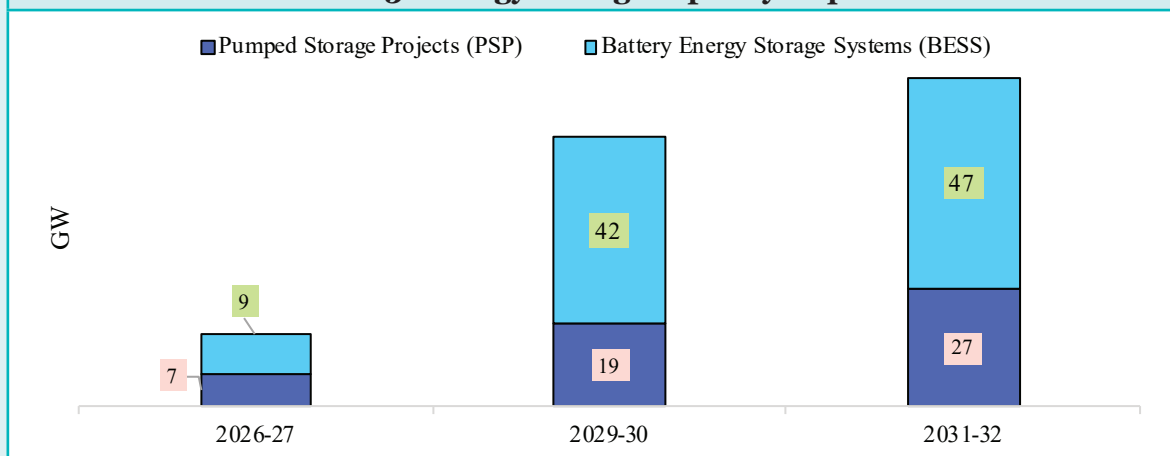
¹⁸ Estimates by Ministry of New and Renewable Energy

¹⁹ REN21. 2024. Renewables 2024 Global Status Report - Renewables in Energy Supply

Box XII. 11: Key Policies in Renewable Energy Sector

National Framework for Promoting Energy Storage Systems (ESS)	Guidelines to promote development of Pumped Storage Projects (PSP)
<ul style="list-style-type: none"> • ESS can be used for storing energy available from RE sources to be used at other times of the day. • This can bring down the variability of generation in RE sources, improving grid stability, enabling energy/peak shifting, providing ancillary support services, and enabling larger renewable energy integration. • Benefit consumers by bringing down peak deficits, peak tariffs, reduction of carbon emissions, deferral of transmission and distribution capex, and energy arbitrage. 	<ul style="list-style-type: none"> • Amongst the various technologies available for addressing the above requirement of storage and ancillary services, pumped storage projects (PSPs) are clean, MW scale, domestically available, time tested and internationally accepted. • Guidelines to promote development of PSPs were issued by the Ministry of Power in April 2023.

Chart XII.23: Energy storage capacity requirement

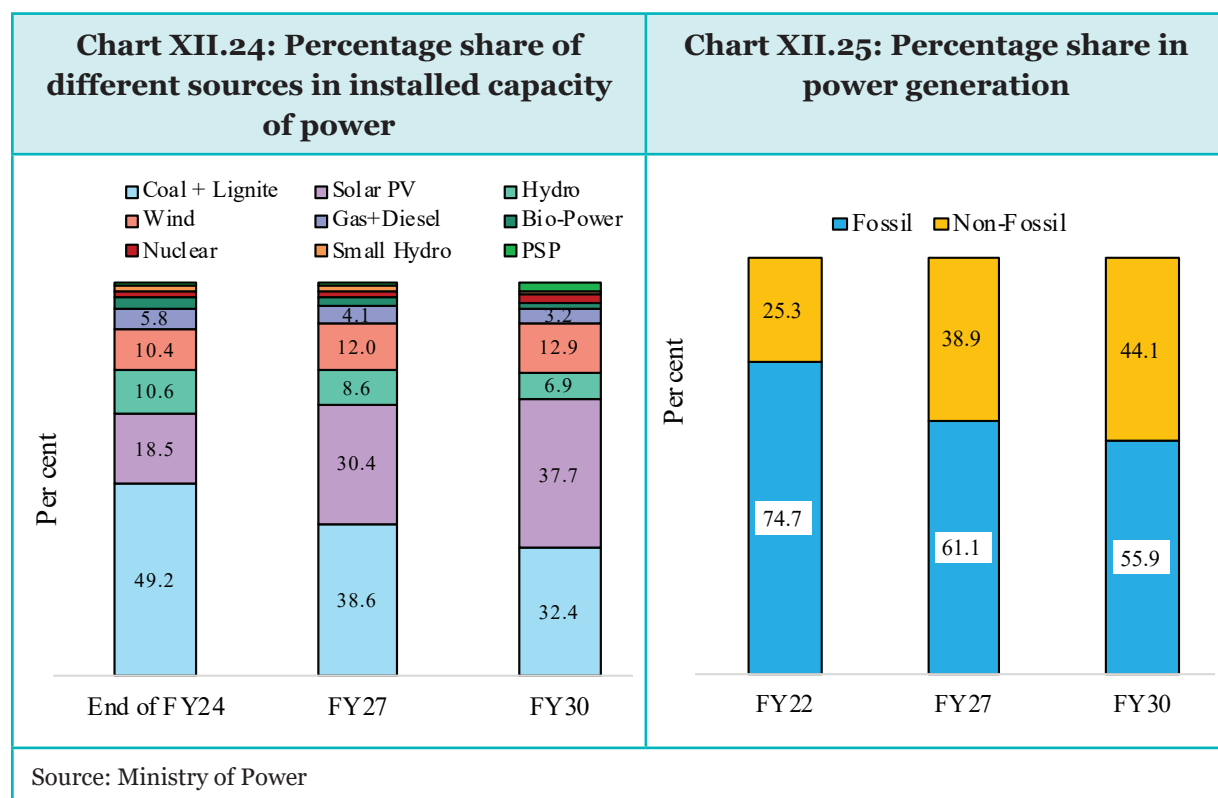


Source: National Electricity Plan (NEP) 2023 & Central Electricity Authority's Report on Optimal Generation Mix 2030 Version 2.0

Box XII. 12: Challenges in Renewable Energy Sector

- **Mobilisation of the necessary finance and investment on competitive terms:** Gearing up the banking sector for arranging finances for larger deployment goals, exploring low-interest rate, long-term international funding, and developing a suitable mechanism for risk mitigation or sharing by addressing both technical and financial bottlenecks.
- **Land acquisition:** Identification of land with RE potential, its conversion (if needed), clearance from land ceiling Act, decision on land lease rent, clearance from revenue department, and other such clearances take time. State Governments must play a major role in acquisition of land for RE projects.

12.39. **Outlook:** India is steadfast in its commitment towards non-fossil fuel-based energy resources with the gradual transition from conventional sources to non-fossil fuel sources. India has put in place a target²⁰ of achieving 50 per cent cumulative installed capacity for generating electric power from non-fossil fuel-based energy resources by 2030. As per the National Electricity Plan of the Central Electricity Authority, non-fossil fuel (hydro, nuclear, solar, wind, biomass, small hydro, pump storage pumps) based capacity which is around 203.4 GW (46 per cent of the total) out of 441.9 GW of total installed capacity in 2023-24 is likely to increase to 349 GW (57.3 per cent) in 2026-27, and 500.6 GW (64.4 per cent) in 2029-30. India already accelerated its effort to enhance its contribution of non-fossil fuel in its energy mix.



Social and Economic Infrastructure

Sports Sector

12.40. The Government has been supplementing States and Union territories in their efforts to bridge critical gaps in sports infrastructure in the country.

20 India's Updated First Nationally Determined Contribution Under Paris Agreement (2021-2030), August 2022 Submission to UNFCCC - <https://tinyurl.com/2p9ncj48>

Box XII. 13: Major Programmes, Projects, and Initiatives in Sports Sector

- National Programme for Development of Sports (Khelo India) programme: 323 infrastructure projects have been sanctioned at a total cost of ₹3,073.7 crore. In FY24, 38 new infrastructure projects were sanctioned, and 58 projects were completed.
- National Sports Development Fund: Ten (seven sports infrastructure and three sports promotion) projects have been sanctioned in FY24.
- Sports Authority of India: Nine infrastructure projects were approved for different centres in FY24. 13 infrastructure projects completed during FY24.
- National Sports University, Imphal: Development underway to enhance India's sports infrastructure and create world-class facilities for sports education, training, and research. The project has a sanctioned cost of ₹611.74 crore, which has reached an overall physical progress of 56 per cent.
- Model Concession Agreement (MCA): To promote private participation in the development of sports infrastructure, Department of Sports has drafted an MCA for Development of Integrated Multi sports Arena on Design, Build, Finance Operate and Transfer (DBFOT) basis for development of integrated sports stadium complex (greenfield/brownfield) on PPP mode, in consultation with Infrastructure Finance Secretariat, Department of Economic Affairs, Ministry of Finance. Once finalised, States/UTs and Union Government departments can utilise the MCA to expedite the onboarding of private players for the development of sports infrastructure.

Water & Sanitation Sector

12.41. The year 2024 marks 10 years of Swachh Bharat Mission – Grameen (SBM-G), Phase I which was launched in October 2014, with a focus on making India open defecation free (ODF) wherein financial incentives were provided for the construction of individual household latrines and funds for construction of community sanitary complexes. After achieving ODF, SBM-G Phase II has been launched to achieve Sampurn Swachhata, i.e., sustaining the ODF status, managing solid and liquid waste by 2024-25 and transforming all the villages from ODF to ODF Plus Model. The total estimated outlay of SBM-G Phase-II is ₹1.4 lakh crore which is to be dovetailed through convergence between different verticals of financing and various schemes of the Government of India and State Governments. During FY24, 1,61,525 villages were covered with solid waste management arrangements, 2,83,998 villages with grey water management, 2,070 blocks were linked with plastic waste management units and material recovery facilities and 159 districts were initiated with faecal sludge management arrangements. Also, in FY24, ₹7,000 crores were allocated to SBM-G, out of which ₹6,802.58 crore (97 per cent) have been utilised.

Box XII. 14: Steel (Barthan) Bank²¹: The idea of Siddhipet district in Telangana

The concept revolves around addressing the challenge of managing plastic waste, particularly disposable utensils, in the Siddipet district through a creative and sustainable solution. The initiative originated during the Kanti-Velugu program in 2022, a state-wide universal eye testing program where medical camps were held across villages, necessitating daily food arrangements for 15-20 staff members.

- The steel bank concept entails providing a variety of steel utensils such as plates, spoons, glasses, bowls, and basins, which are stored as a bank at the Gram Panchayat Office.
- The benefits of the initiative have been the reduction of plastic waste accumulation, increased community awareness regarding the adverse effects of plastic consumption, such as cancerous and digestive issues due to indirect consumption of micro-plastics, additional income sources for communities, Self-Help Groups (SHGs), and Gram Panchayats, which is utilized for operational, maintenance, and expansion purposes.
- The key outcome has been reduced plastic waste collection, dumping, and burning, with an expected reduction of 6-8 kilograms of plastic waste per event and 28 quintals per month.
- The initiative of Barthan Bank has been implemented in the local bodies of many other States.

12.42. The Jal Jeevan Mission (JJM) launched in August 2019 to provide a tap water connection to every rural household by 2024 with a total outlay of ₹3.6 lakh crore. Out of this outlay, the central share is ₹2.08 lakh crore and the remaining ₹1.58 lakh crore is to be shared by the States. Out of around 19.30 crore rural households, at the time of inception of the mission, only 3.23 crore rural households (17 per cent) had provision of tap water connection which has now increased to more than 14.89 crore rural households (76.12 per cent).

Box XII. 15: Sailam:²² A model village of Mizoram for sustainable rural water supply

- Under JJM, Sailam transformed from water scarce to a water-sufficient model village. Sailam is now a 'Har Ghar Jal' village with a 24x7 community-managed water supply system. A 900 KLD capacity water storage tank was built, and water collected from the nearby spring was pumped into the reservoir through solar pumps. Water from the reservoir is fed to individual households as well as a zonal reservoir of capacity 700 KLD by gravity system. Existing sources as well as infrastructure have been well integrated with the new scheme to optimize cost and ensure 24x7 adequate and potable water at nominal cost.

²¹ Department of Drinking Water and Sanitation, Ministry of Jal Shakti

²² Department of Drinking Water and Sanitation, Ministry of Jal Shakti

- Water meters have been installed by villagers on their own. They are paying user charges @ of ₹0.04/ litre/ per month, based on actual consumption. Encouraged by the work of providing water in every rural household, the community is now protecting 30 acres of forest under the catchment area of existing spring sources to ensure long-term source sustainability. Some villagers have donated their land voluntarily for watershed development. Also, a local pump operator has been trained, who is responsible for the O&M of the water supply system. The operator is also responsible for generating bills based on water consumption, collecting monthly water service from each household, keeping records of daily water consumption and expenditure in O&M, water quality testing through Field Testing Kits (FTKs) and maintaining a complaint register etc.

Water Resource Management Sector

12.43. The Namami Gange programme - National Mission on Clean Ganga (NMCG) launched in 2014-15 is a flagship integrated conservation mission focusing on pollution abatement, conservation, and rejuvenation of river Ganga. The budget for the programme has increased from ₹20,000 crore (2014-2020) to ₹22,500 crore (2021-2026)²³.

12.44. Namami Gange is using the widely popular Hybrid Annuity Model (HAM) for the sewage treatment plants being set up under this initiative. HAM is PPP-based approach to the sewerage infrastructure sector, wherein 40 per cent of capex is paid during construction and the balance 60 per cent is paid in 15-year annuity along with interest with separate payments for O&M. As on date, 33 projects have been sanctioned. Further, the approach of 'One City-One Operator' has also been adopted and this model has been followed for HAM projects where existing Sewage Treatment Plants (STPs) in towns are being integrated with newly sanctioned projects and tendered under HAM-based PPP mode.

Box XII. 16: Major Programmes Water Resource Sector

Dam Rehabilitation and Improvement Project (DRIP)

- DRIP is being implemented with financial assistance from the World Bank to improve the safety and operational performance of selected existing dams along with dam safety institutional strengthening with system-wide management approach.
- In DRIP phase-I (2012-21), 223 dams were rehabilitated at a total cost of ₹2,567 crore. Six states and two central agencies participated in the scheme.
- DRIP Phase II and Phase III (2021-31) envisage improving the safety and operational performance for rehabilitation of 736 dams with a budget outlay of ₹10,211 crore; 19 States and 3 central agencies are participating in the scheme.

²³ PIB dated 13 Feb 2023, Ministry of Jal Shakti - <https://tinyurl.com/3dx3prp5>

Atal Bhujal Yojana

- World Bank aided Central Sector Scheme with an outlay of ₹6,000 crore, being implemented from 1st April 2020 for five years. Planned in 8,213 water-stressed gram panchayats (GPs) of 229 administrative blocks/ talukas in 80 districts of seven States.
- Only program targeting demand side groundwater management, focusing on behavioural change of the community. GPs are equipped with instruments for monitoring water level, water quality, rainfall, and groundwater extraction.
- The water budget & water security plans of all 8,213 GPs have been prepared and updated by the community. 47 blocks and 813 GPs have shown an improvement in the rate of decline of groundwater.

Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)

- Launched in 2015-16 to enhance physical access to water on farms and expand cultivable areas under assured irrigation, improve on-farm water use efficiency and introduce sustainable water conservation practices.
- PMKSY is an umbrella scheme, consisting of two major components namely, the accelerated irrigation benefit programme (AIBP), and Har Khet Ko Pani (HKKP).
- Under AIBP, 58 projects have been completed out of 99 projects with central assistance of ₹14,372 crore during 2016-24. As a result, 25.80 lakh hectare of additional irrigation area was created during 2016-17 to 2023-24.
- Under the HKKP - Surface Minor Irrigation sub-component, 2,497 schemes out of 4,305 have been completed with the creation of an irrigation potential of 266.49 thousand hectare during 2016-17 to 2023-24. Under the HKKP - Repair, Renovation and Restoration of Water Bodies subcomponent, 1,489 out of 3,450 schemes have been completed with restoration of irrigation potential of 109.14 thousand hectare during 2016-17 to 2023-24.

Interlinking of Rivers Project

- Under this project, 30 links (16 under the Peninsular Component and 14 under the Himalayan Component) have been identified under the National Perspective Plan (NPP).
- Five-link projects have been identified as priority link projects viz; Ken Betwa Link Project, Modified Partbati-Kalisindh-Chambal link project and Godavari-Cauvery link project (comprised of 3 link segments).
- Ken Betwa Link Project is the first link of NPP under implementation that was approved in the year 2021 for implementation with central support of ₹39,317 crore and to be implemented jointly by Madhya Pradesh, Uttar Pradesh, and the Union Government.

Box XII. 17: Major Initiatives in the water management sector

- A platform for real-time analysis of Yamuna, Ganga, and their tributaries (PRAYAG) an online dashboard for continuous monitoring of river quality and sewage treatment infrastructure has been launched in April 2023
- Global River Cities Alliance led by NMCG is a unique and first-of-its-kind alliance covering over 275 global river cities in 11 countries, international funding agencies and knowledge management partners toward river conservation and sustainable water management.
- Under the groundwater management & regulation (GWMR) scheme, the groundwater regime at the national level is monitored through around 26,000 groundwater monitoring stations spread across the country. More than 5,000 stations are equipped with digital water level recorders with telemetry for real-time monitoring. Around 300 demonstrative artificial groundwater recharge structures have been created in different parts of the country.
- The first census of water bodies in the country was completed and published in 2023. 24,24,540 water bodies have been enumerated in the country, out of which 97.1 per cent (23,55,055) are in rural areas and 2.9 per cent (69,485) are in urban areas.
- To address dam safety issues holistically, the Government has enacted the landmark Dam Safety Act in December 2021 to provide for surveillance, inspection, operation, and maintenance of the specified dam for prevention of dam failure-related disasters and to provide for institutional mechanisms to ensure their safe functioning. All the large dams in the country come under the ambit of the Dam Safety Act 2021. As per National Register of Large Dams 2023, there are 6,281 dams in the country.
- Technological Innovations such as WQMIS, India-WRIS Portal, PM GatiShakti NMP portal etc. have been developed to improve data-led water governance.

Urban Sector

12.45. **Housing for All:** The vision being pursued by the implementation of Pradhan Mantri Awas Yojana-Urban (PMAY-U) since 2015 to provide pucca houses with basic amenities to all eligible beneficiaries in urban areas. Based on a demand survey conducted by States/UTs, more than 1.18 crore houses have been sanctioned of which about 1.14 crore have been grounded for construction and more than 84 lakh have been completed/delivered. The scheme has been extended for two years, until 31st December 2024 to complete all sanctioned houses. The total investment under the scheme is estimated to be ₹8.07 lakh crore which includes Central, State/UT and beneficiary contributions. Central assistance of ₹1.64 lakh crore has already been released to States/UTs out of ₹2.00 lakh crore approved under the Scheme.

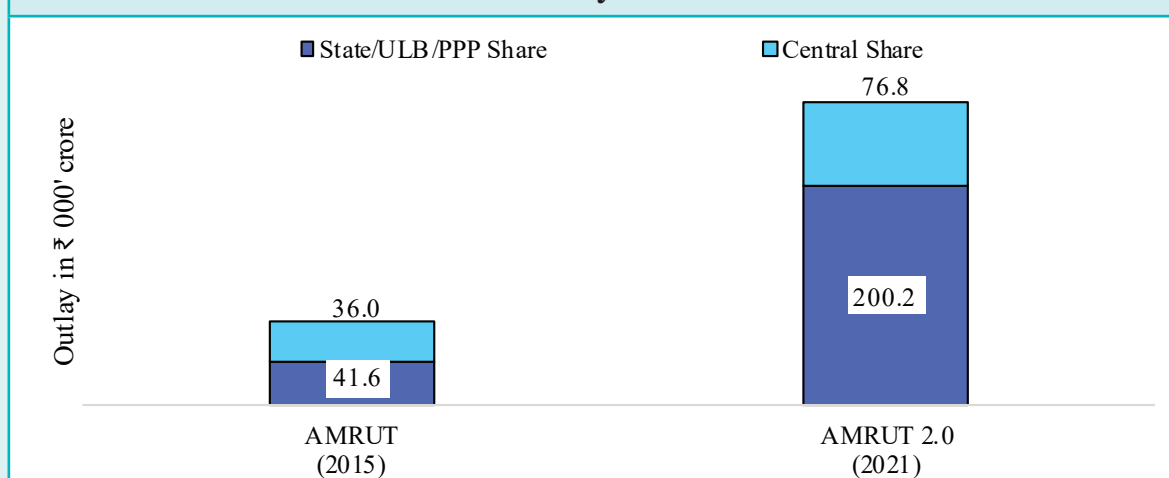
12.46. Affordable Rental Housing Complexes (ARHCs) initiative is being taken up for the first time in the country to improve living conditions and obviate urban migrants/ poor from staying in slums, informal settlements or peri-urban areas. So far, under Model 1, a total

of 5,648 houses have been made operational and another 7,413 houses are in process. Under Model 2, MoHUA has approved proposals of 82,273 new ARHC units in 7 States with a Technology Innovation Grant (TIG) of ₹173.89 crore of which construction for 44,116 ARHCs units is grounded for construction. Out of these grounded units, construction has been completed for 3,969 units at Sriperumbudur.

Box XII.18: Atal mission for rejuvenation and urban transformation (AMRUT)

- AMRUT launched in June 2015 in 500 cities focused primarily on providing safe and assured drinking water supply universally.

Chart XII.26: Total outlay for AMRUT 1.0 and 2.0



Source: Ministry of Housing and Urban Affairs

- Contracts for 5,999 projects worth ₹83,327 crore awarded of which 5,304 projects worth ₹51,434 crore (62 per cent) were completed.
- AMRUT includes eleven reforms comprising of 54 milestones to be achieved by the States and Union Territories over four years. These were aimed to improve service delivery, mobilise resources and make municipal functioning more transparent and accountable.
- AMRUT 2.0 launched in October 2021 for five years with a focus on making the cities self-reliant & water secure and providing universal coverage of sewerage & septage management in 500 AMRUT cities. The rejuvenation of water bodies and wells is one of the important components of this mission.
- Major reforms under AMRUT 2.0 include notification of property tax and user charge, enhancing financial sustainability and water security of urban local bodies, recycle/reuse of 20 per cent treated used water, double entry accounting system and efficient town planning etc. To encourage PPPs, projects worth 10 per cent of allocation in million plus cities are mandated to be implemented in PPP mode.

12.47. At present, 945 km of metro rail or regional rapid transit system (RRTS) lines are operational, and 939 km are under construction in a total of 27 cities. About 86 km of metro rail/RRTS lines have been operationalised in FY24. Daily ridership achieved for the operational metro rail/ RRTS lines was 1.01 crore as of March 2024.

Box XII. 19: Smart Cities Mission (SCM)

- SCM launched in June 2015 to promote cities that provide core infrastructure, clean and sustainable environment and give a decent quality of life to their citizens through the application of ‘smart solutions’.
- A total number of 100 cities have been selected for development as smart cities. As on 20 June 2024, 100 SPVs have undertaken 8,011 multi-sectoral projects worth around ₹1.64 lakh crore; of which 7,153 projects (89 per cent) worth ₹1.43 lakh crore (87 per cent) have been completed.

Chart XII.27: Value of projects completed under smart city mission (FY23 & FY24)

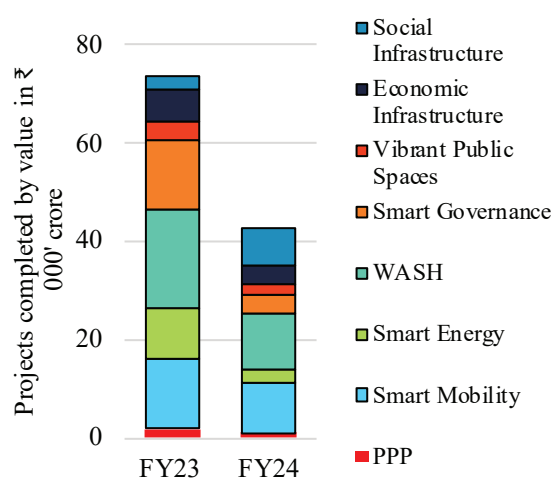
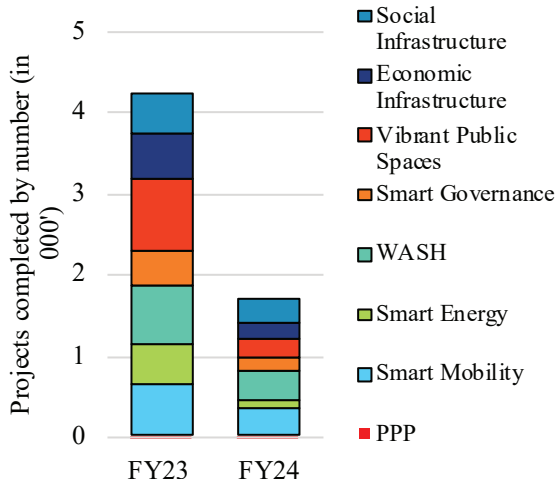


Chart XII.28: Number of projects completed under smart city mission (FY23 & FY24)



Source: Ministry of Housing and Urban Affairs

12.48. **Swatch Bharat Mission Urban (SBM-U):** Focuses on ensuring every citizen including poor household of urban India has access to sanitation facilities. The objectives of SBM-U are to make the urban areas open defecation free (ODF) and achieving garbage free status for all cities through 100 per cent source segregation, door to door collection and scientific management of all fractions of waste²⁴. SBM-U achievement includes the construction of 63.07 lakh individual household latrine (IHHL) units surpassing the target by reaching 113.75 per cent and 6.37 lakh community and public toilets, exceeding the target by nearly 128 per cent.

24 MoHUA PIB dated 21 Dec 2023 - <https://tinyurl.com/yxzxuefu>

Box XII. 20: Case Studies on Swatch Bharat Mission Urban (SBM-U)

Organic waste management

- Indore's 500 tonnes per day (TPD) Bio-methanation Plant Set up in PPP Model: In November 2021, Indore Municipal Corporation (IMC), established 500 TPD Bio-methanation plant. The plant operates on DBFOT Model which is Design-Build-Finance-Operate-Transfer as a Public-Private Partnership (PPP). The plant generates around 44,000 - 45,000 m³ of raw biogas daily from which around 17,000 kg of bio-CNG is produced every day. The CBG plant has contributed to reducing 1,30,000 CO₂ emissions annually.
- Black Soldier Flies (BSF) being used in Mangalore for treatment of wet waste: A facility has been set up in Mangalore as part of a public-private partnership for treating around 10,000 tonnes of wet waste annually. Innovative technology in BSFs breeding provides an advantage of large-scale deployment at rapid speed to consume all the wet waste quantity of a city and thereby solve the problem of wet waste management. It takes 12-14 days for the wet waste to be converted into compost through BSFs compared to 45-60 days in the case of aerobic composting.
- Indore Bio CNG: The plant boasts a processing capacity of 400 metric tons per day, operating under a Public Private Partnership. The plant processes organic waste, yielding 14.8 metric tons of Bio-CNG for use as transportation fuel and 80 metric tons of Fermented Organic Manure daily.

Waste to Electricity

- Waste to Electricity plant in Pimpri-Chinchwad municipal corporation: The biodegradable waste is converted into Compost and sold to nearby farmers. The project includes a material recovery facility with a capacity of 1000 TPD, which features mechanised windrow composting of 500 TPD. The energy generated from the waste to energy plant is captive use for municipal purposes and any other use with the corporation's consent. The project is being operated on a PPP Model on a DBFOT basis (Design, Build, Finance, Operate, and Transfer).

12.49. **Outlook:** It is expected that by 2030, more than 40 per cent²⁵ of India's population will live in urban areas, cities need to be transformed into economic centres of growth by building future-ready urban infrastructure with combined efforts of central, state, and urban local bodies. This can be achieved by efficiently planning urban areas, developing robust project frameworks, and strengthening urban local bodies (ULBs). Project-based funding models with clearly ring-fenced revenue streams can effectively tap not only viability gap-based funding but also market borrowings and credit enhancement structures. ULBs and project-implementing agencies need to undertake value-for-money analysis and apply the waterfall mechanism to derive the optimum mode for implementing the projects.

²⁵ Inputs provided by Niti Aayog

Tourism Sector

12.50. Under the PRASHAD scheme which caters to the augmentation of tourism infrastructure at pilgrimage and heritage sites, 29 new sites have been identified for development. Out of the total sanctioned amount of ₹1,621.14 crore for the projects under the scheme, 62.7 per cent has been disbursed. The Government has also revamped its Swadesh Darshan scheme in the form of Swadesh Darshan 2.0 with an outlay of ₹3,800 crore. The mission aims to create a robust framework for the integrated development of tourism destinations. Under the scheme, 57 destinations across 32 State Government and Union Territory administrations have been identified to date. Twenty nine projects have been sanctioned at a total cost of ₹644 crore.

Strategic Infrastructure

Space Sector

12.51. Over the last few years, the space sector has seen remarkable progress in the build-up of rockets, satellites and spacecraft used for space exploration, and ground infrastructure. Presently, India has 55 active space assets which include 18 communication satellites, nine navigation satellites, five scientific satellites, three Meteorological Satellites, and 20 Earth Observation satellites. In addition to existing Launch Vehicles with ISRO viz. Polar Satellite Launch Vehicle (PSLV) and Geosynchronous Satellite Launch Vehicle (GSLV), the organisation has added two more to its fleet i.e., Launch Vehicle Mark-3 (LVM3) and the Small Satellite Launch Vehicle (SSLV).

12.52. A string of Space exploration missions has been conducted viz. Mars Orbiter Mission (2014), ASTROSAT (2015), Chandrayan-2 Orbiter (2019) and subsequently, Chandrayaan-3 landing on the Moon (2023) & Aditya – L1 mission (2023). Further, the indigenous satellite navigation constellation i.e., NavIC series was completed and operationalised in 2016. New Space India Limited [NSIL] has successfully executed its contract to launch 72 satellites of OneWeb to Low Earth Orbit through LVM3, M2 and M3 missions, establishing LVM3 as a reliable Launch Vehicle in the global commercial launch services market.

Box XII.21: Private participation in the Space sector

Space sector reforms announced in 2020 have been transformative in enhancing the participation of private players in the Indian space programme. Some key initiatives to promote private participation and boost India's market share in the global space economy are below:

- Indian National Space Promotion and Authorisation Centre (IN-SPACe) – a single window agency to promote and authorise space activities was inaugurated in June 2022 at Ahmedabad. IN-SPACe has received 440 applications as on 1st January 2024 from more than 300 Indian entities pertaining to authorisation, handholding, facility support and consultancy, technology transfer, and facility usage.
- 51 MoUs and 34 joint project implementation plans have been signed with various non-governmental entities as of 1st January 2024, to extend the necessary support for carrying out the space activities.

- Several entities in the private sector have developed satellites and functional payloads for operations in outer space viz., PixxelSpace, Digantara, Dhruva Space, Azista BST Aerospace, Tata Advanced Systems Limited, etc.
- Launch of Vikram-S (Prarambh mission), a suborbital launch vehicle from M/s Skyroot Aerospace Pvt. Ltd., Hyderabad, was accomplished on 18th November 2022.
- The first private launchpad and mission control centre was established by M/s Agnikul Cosmos Pvt. Ltd., Chennai in ISRO campus at SDSC, SHAR on 25th November 2022.
- HAL and L&T consortia has been selected as the Indian industry partner for the end-to-end production of five PSLVs.
- The process for transfer of small satellite launch vehicle technology has been initiated.

12.53. Adoption of space-based technology and services are often related to their adequate integration into the societal applications, towards meeting the requirements of end users. Major technological areas wherein a developmental gap exists include the development of indigenous capability for the realisation of carbon fibres, dedicated captive semiconductor fab for space applications, availability of major alloying elements, etc. Challenges related to the commercialisation of technologies include the presence of a very niche and/or competitive marketplace, pricing constraints, typically limited demand that inhibits large-scale commercialisation, lack of visibility of long-term demand, etc.

Digital Infrastructure

12.54. The construction sector accounted for around 9 per cent of India's annual GVA (2023-24), however, it is amongst the least digitalised sectors. In recent years, various aspects of infrastructure development have been integrated with technology to improve the efficiency of infrastructure plans, designs, and assets. Some of the most significant uses of technology have been through PM GatiShakti, Bhuvan, BharatMaps, Single Window Systems, PARIVESH portal, National Data Analytics Platform, Unified Logistics Interface Platform, Pro-Active Governance and Timely Implementation (PRAGATI), India Investment Grid (IIG) and many similar dashboards and data stacks for almost all ministries.

Box XII.22: Building Information Modelling (BIM)

- According to the OCMS²⁶, about 27% of projects witness cost overruns, whereas 45% witness time overruns. One of the least digitalised sectors, it is estimated that 20% of time is lost in searching relevant information in infrastructure and construction sector.

²⁶ Online Computerised Monitoring System (OCMS) for Projects and Infrastructure Monitoring – initiative of The Project Monitoring Division and Programme Implementation Wing in the Ministry of Statistics and Programme Implementation (MOS&PI) that provides management services by providing latest information on implementation of projects costing Rs 150 crores and above and performance of infrastructure sectors.

- It is estimated that for complex infrastructure projects in India, adopting BIM can reduce the average project delays of 39 months, reduce infrastructure construction costs up to 30 per cent, maintenance costs up to 20 per cent, information and systemic inefficiencies up to 20 per cent, construction sector related carbon emission up to 38 per cent, water consumption up to 10 per cent and improve investments in construction R&D by one per cent, and result in over four million skilled professional employment and about 2.5 million additional construction sector jobs by reinvesting savings in additional infrastructure.
- The motto of BIM is to construct digitally before constructing physically. Niti Aayog has identified the challenges, solutions and enablers related to BIM implementation. Relevant public/ private and academic stakeholders have been identified and are being engaged. Based on a roadmap for creating an ecosystem towards faster adoption of BIM in India, guidance, and strategies are being provided to infrastructure projects, including Central Vista, New Parliament, and Central Secretariat.
- BIM is now being extensively utilised and leveraged by some ministries and departments like the National Capital Region Transport Corporation, all metro rails, select complex industrial and tourism projects, various airports, along with organisation-wise acceptance at Central Public Works Department and extensive digitalisation in the form of Data Lake across NHAI that is now being extended to entire Ministry of Road Transport & Highways.

Telecommunication Sector

12.55. The usage and underlying technologies of telecommunications have undergone massive changes, especially in the past decade. The Telecommunications Act 2023 was enacted to amend and consolidate the laws on telecommunication services and networks, assignment of spectrum and related matters.

12.56. The total number of mobile towers in the country is 8.02 lakh as of June 2024 while number of Base Transceiver Stations (BTSS) stood at 29.37 lakh and 5G BTSS were 4.5 lakh. The Government has also initiated the project for saturation of 4G mobile services with a total cost of ₹26,316 crore in 24,680 uncovered villages in remote and difficult areas. 6,279 villages having only 2G/3G connectivity shall be upgraded to 4G.

Box XII.23: BharatNet Project

- The BharatNet project is being implemented in a phased manner to provide broadband connectivity to all (2,50,000) the Gram Panchayats (GPs) in the country. The project has been amended to expand the scope with a focus on utilisation of services, using professional agencies for construction, upgradation and maintaining the network.
- 6,85,501 km of optical fibre cable has been laid, 2,11,021 GPs have been connected by Optical Fiber Cable (OFC) and a total 2,12,229 GPs are service-ready (OFC+ Satellite), as of 30th April 2024. Fibre to home (FTTH) connections and pilot projects to enhance data usage are also planned across rural areas.

12.57. Test labs for telecom equipment are important for ensuring the functionality, reliability, and interoperability of telecommunications devices. These specialised facilities are equipped with advanced testing infrastructure to evaluate the performance of various telecommunications equipment such as routers, switches, base stations, and communication protocols. More than 69 labs have been designated as conformity assessment bodies for EMI/EMC, safety evaluations, technical requirements and RF testing of telecom products.

12.58. The Government has introduced guidelines for the Spectrum Regulatory Sandbox (SRS), or Wireless Test Zones (WiTe Zones), as part of the Millennium SRS initiative to foster innovation, enhance ease of doing business, promote “Make in India” in the telecommunications sector. This initiative provides a simplified regulatory framework to facilitate Research and Development (R&D) activities, promote exploration of spectrum bands and drive technological advancements. WiTe Zones have been categorised into urban or remote areas for experimentation across various frequency bands, with eligibility extending to academia, R&D labs, telecom providers and others.

Electronics & Information Technology Sector

12.59. The Government has envisioned the India AI programme as a mission-centric approach for leveraging transformative technologies to boost inclusion, innovation, and adoption for social impact. Pillars of India AI include AI in Governance, AI IP & Innovation, AI Compute & Systems, Data for AI, Skilling in AI, and AI Ethics & Governance. As part of building ‘AI in India and AI for India’, the first edition of the IndiaAI was released in October 2023.

12.60. India is the founding member of the Global Partnership on Artificial Intelligence (GPAI), having joined the multi-stakeholder initiative in June 2020. Since then, India has contributed to the GPAI goals and objectives and is working on various domestic initiatives for the responsible development, deployment, and adoption of AI. India served as an Incoming Council Chair of GPAI in 2023, then subsequently Lead Chair in 2024, and Outgoing Chair in 2025. The Union Cabinet has approved an allocation of over ₹10,300 crore towards the comprehensive IndiaAI Mission to democratise access to AI innovation pillars and ensure global competitiveness of India’s AI ecosystem.

12.61. AI Research Analytics and Knowledge Dissemination Platform (AIRAWAT) which is an AI Supercomputer, installed at C-DAC, Pune has secured 75th position in the top 500 global supercomputing list declared at the International Supercomputing Conference 2023 in Germany.

12.62. Under the Digital India programme, initiated in July 2015 to transform India into a digitally empowered society and knowledge economy, various digital initiatives have been undertaken for the delivery of citizen-centric services. MeriPehchaan²⁷, a National Single Sign-On (NSSO) is a user authentication service wherein a single set of credentials can provide access to multiple online applications or services. Currently, more than 9,600 services of various Ministries/States are integrated with NSSO. The DigiLocker²⁸ platform that provides citizens with ease of digital storage, issuance and verification of documents and certificates has now

²⁷ <https://meripehchaan.gov.in/>

²⁸ <https://www.digilocker.gov.in/>

reached over 26.28 crore users registered and over 674 crore documents. The unified mobile application for new-age governance (UMANG) platform that been developed to deliver major government services through a single Mobile app, now has 2,019 services of 207 Central and State Government departments.

Box XII.24: GI Cloud - 'MeghRaj'

- To harness the benefits of Cloud Computing, the Government has embarked upon an ambitious initiative – 'GI Cloud'.
- The objective of the initiative is to deliver information and communications technology (ICT) services over the Cloud to all the Departments/Ministries at the Centre and States/UTs to ensure the proliferation of Cloud ecosystem in the country.
- Presently, 25,806 virtual machines are running on GI Cloud and it is being used by more than 1,767 applications of the Government departments.
- To proliferate the MeghRaj ecosystem, the Government has also empanelled cloud service offerings of domestic and international cloud service providers (CSPs). Until date, 22 CSPs are empanelled and so far, more than 250 central and state departments are using the cloud services of empanelled CSPs.

CHALLENGES AND OPPORTUNITIES

12.63. As the different sections in this Chapter show, there has been a quantum jump in infrastructure build-up in the last five years. However, there are some areas for corrective and collective actions, as presented in this section.

12.64. **Land Related:** Despite the large build-up of connectivity infrastructure and energy-related assets, both the sectors reported the need for corrections in the delay in land acquisition, and land-related clearances. Issues are also raised about slow on-boarding of digital land records. In the case of airport development, greenfield airport projects are time-intensive due to the need for appropriate site selection, land acquisition and necessary approvals. Addressing challenges related to land in physical infrastructure requires coordinated action at different tiers of the Government.

12.65. **Skill Demands:** The aviation sector highlighted that technical knowledge for the development of segments such as maintenance, repair and overhaul (MRO) operations and manufacturing are concentrated with a limited number of original equipment manufacturers. The airline industry is a highly competitive segment, susceptible to external shocks such as oil prices, exchange rates, epidemics, wars, and equipment issues. These shocks can affect the operations of an airline and impact its viability, hence the development of capabilities in segments such as MRO, leasing and skilling are needed to further support the airlines. Many aspects related to project development, feasibility assessment, financial return analysis and different stages of project management, in the case of infrastructure projects, involve specialised technical skills that need to be nurtured based on systematic need assessment. Effective public-private participation is essential for this.

12.66. **Need to improve private participation:** The addition to the stock of infrastructure in the last five years owed predominantly to public sector financing. Private sector participation is not forthcoming to the extent desired. Literature suggests that many factors are impeding private participation in infrastructure building. Some of the important ones are the following:

- a. Lumpy capital investment and long payback period and difficulty in mobilising large equity and debt at affordable cost. Many novel PPP financing models like hybrid annuity model, have been introduced to mitigate this constraint. But private sector participation through these modes has so far been limited to only certain sectors like roads and water.
- b. Project structuring issues related to risk estimation, allocation and mitigation
- c. Delays in getting clearances and land acquisition
- d. Lack of an independent regulator for infrastructural sectors, etc.
- e. Contractual issues and inadequate arrangements for dispute resolution and arbitration, leading to prolonged litigation.

12.67. The question of **climate and environmental sustainability** is increasingly becoming important in infrastructure building as discussed in the sections on physical connectivity and energy infrastructure. An emerging challenge for the aviation sector would be compliance with mandatory phase of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) from 2027. Since India is a Member State of ICAO, obligated to comply with offsetting requirements i.e., either use sustainable aviation fuel (SAF) or offset their emissions by purchasing carbon credits from ICAO approved emissions unit programmes. However, there are no ICAO-approved emissions unit programmes in India to supply CORSIA-eligible emissions units, to meet the offsetting requirements of airline operators. The cost of SAF is almost 3 to 5 times the cost of fossil ATF depending on the feedstock and pathway used for the production of SAF²⁹.

12.68. **Lack of aggregation of financial flows into infrastructure:** Infrastructure financing structure is complex with the involvement of multiple stakeholders, including all tiers of the Government, public sector enterprises, commercial banks and non-banking financial companies, special purpose vehicles, capital market players, development financial institutions and foreign investors. The instruments of resource mobilisation are many, i.e., credit, bonds, equities, hybrid instruments like mutual funds, foreign capital inflows and instruments like InvITs and REITS. The following are some issues that merit attention:

- a. A common issue is about different reporting formats and sectoral splits followed in different sources of financing. The detailed information required for the Central and State Governments can be obtained from the object heads of expenditure maintained by the CGA and C&AG. However, such detailed information on sectoral financial flows is hard to come by for almost all other sources. Besides, the information of bank credit is reported in a different format than the capital market flows, external commercial borrowings and FDI data. The periodicity of reporting, and even the definition of the term ‘infrastructure’

29 Working Paper on Views on Global Framework on SAF, LCAF and other Aviation Cleaner Energies, Related Assistance and Finance, International Civil Aviation Organization, 2023 - <https://tinyurl.com/yck3bwbs>

employed are also different. Some data, like the data on bank credit, are available only as an outstanding figure on a particular date.

- b. Among the Government sources, the available information on the capital expenditure by the local self-governments is inadequate. The city finance portal of MoHUA is an important source of information on the finances of urban self-governments. Likewise, the eGramSwaraj portal, maintained by the Ministry of Panchayati Raj, is an emerging source on the finances of rural self-governments. However, the information on capital expenditure, with sectoral split, is not available in good shape from these portals.
- c. The information on budgetary support by State Governments to State public sector enterprises (SPSEs) is available in the C&AG reports. However, there is no ready source of information on the fund flow from SPSEs to infrastructure sectors.
- d. One exhaustive source of information on the capital expenditure by the private corporations (and public sector enterprises) is the MCA database. However, expansive data filings by companies become available only with a lag, which also require rigorous consistency checks before attempting any aggregation.
- e. There are several forms of flow of funds between different infrastructure financing sources, which makes a simple aggregation of all sources largely meaningless. Such financial flows occur between different tiers of the Government, between Governments and their public enterprises, between banks and NBFCs, etc. Hence, avoiding double counting of financial flows requires careful scrutiny of different datasets.

12.69. **Lack of total picture of physical progress in infrastructure projects:** The last decade witnessed earnest efforts on the part of the Government to build institutions and structures that monitor progress in infrastructure and disentangle bottlenecks. A discussion on these measures follows this section. However, there is no single source that gives an inventory of infrastructure projects in the country, undertaken at different levels so as to evaluate progress sectorally and sub-sectorally vis-à-vis corresponding targets. Overcoming this limitation involves coordination of central, state and the third tiers of the Government working with project authorities, including public sector enterprises and private partners.

FACILITATION AND ADDRESSING THE BOTTLENECKS

National Infrastructure Pipeline (NIP)

12.70. The portal provides opportunities for Ministries and States/UTs to collate all major infrastructure projects at a single location, thus acting as a centralised portal to track and review project progress across all economic and social infrastructure sub-sectors. The portal also enables project-sponsoring authorities to showcase investment opportunities to national and international investors.

12.71. The Government launched the NIP with a forward-looking approach and with a projected infrastructure investment of around ₹111 lakh crore during FY20-25 to provide high-quality infrastructure across the country³⁰. NIP includes infrastructure projects of more than ₹100 crore each covering greenfield and brownfield investments. As of 12 April 2024, out of

30 Report of the Task Force National Infrastructure Pipeline (NIP), 2020 - <https://tinyurl.com/3j48tuhj>

the total capital outlay under NIP, the transportation sector dominates with a contribution of 58 per cent, followed by the energy sector at 24 per cent, and the water and sanitation sector at 12 per cent, and balance five per cent by other sectors such as social infrastructure, communication, etc.

12.72. NIP currently has over 9,666 projects and schemes covering 37 sub-sectors (as on 12th April 2024) that are hosted and monitored through the India Investment Grid (NIP-PMG) integrated portal. Out of these projects, 4,413 projects (46 per cent) are under implementation while 2,062 projects (21 per cent) have been completed.

Project Monitoring Group (PMG)

12.73. PMG is an institutional mechanism for expeditious resolution of issues and regulatory bottlenecks in projects with an investment of ₹500 crores and above. The PMG mechanism allows project proponents to raise issues with concerned the Government agencies that are causing hindrances in the implementation of projects.

12.74. PMG has facilitated resolution of 6,867 issues in 1,443 projects worth ₹46.1 lakh crore. The PMG portal has on-boarded 2,457 projects worth ₹62.5 lakh crore until March 2024 which consist of all important mega infrastructure projects including high-impact PM GatiShakti projects and critical infrastructure gap projects.

PM GatiShakti National Master Plan (PMGS-NMP)

12.75. PMGS-NMP is a whole-of-government approach adopted to facilitate integrated planning of multimodal infrastructure through collaboration among the Ministries concerned. PMGS-NMP has been adopted at the State and Centre level to assess last-mile connectivity gaps and ensure seamless movement of people and goods. This is a transformative approach for planning multimodal infrastructure connectivity to economic nodes, thereby bringing logistics efficiency.

12.76. As on March 2024, 43 Ministries have been onboarded on PMGS-NMP portal. 1,530 data layers (642 Ministry data layers & 888 State data layers) of Ministries and States have been uploaded on the PMGS-NMP portal. 16 Ministries have a dedicated PMGS cell which has streamlined project planning. 22 social sector Ministries onboarded with over 200 data layers mapped on portal. All 36 States and Union Territories have formed State-level institutional mechanism and State Master Plan portals and 533 projects have been planned on NMP. Network Planning Group, a central-level institutional mechanism of the PMGS-NMP has evaluated 149 project proposals with total estimated project cost of ₹13.3 lakh crore.

Box XII.25: Implementation of NLP gains steam

India's focus on improving logistics infrastructure has led to an improvement of six places from 44 in 2018 to 38 in 2023 out of 139 countries in the Logistics Performance Index of the World Bank.

National Logistics Policy (NLP) was launched in September 2022 to complement PMGS-NMP i.e., to drive business competitiveness through an integrated, efficient, sustainable, and cost-effective logistics network by leveraging best-in-class technology, and processes. The aim is to reduce the cost of logistics, improve the Logistics Performance Index ranking, and create a data-driven decision support mechanism for an efficient logistics ecosystem. NLP is being implemented through a comprehensive logistics action plan. The progress under each of these action areas is below:

i. Integrated Digital Logistics Systems:

- Unified Logistics Integrated Platform, a single window platform, integrating 36 logistics-related digital systems/portals across eight Ministries and providing real-time information on 1,800 data fields has been developed.
- For tracking 100 per cent of India's containerised EXIM cargo, a Logistics Data Bank has been developed which uses Radio Frequency Identification (RFID), IoT, and Big data analytics and is integrated with 28 port terminals of India, over 95 toll plazas, 407 container freight station/inland container depot and empty yards, 56 SEZs, three integrated check posts.

ii. Service Quality Standards: An e-book has been developed on warehousing standards delineating existing standards issued by the Bureau of Indian Standards and Warehouse Development and Regulatory Authority.

iii. Capacity Building: Training courses on logistics and PMGS-NMP are being integrated with central and state training institutes.

iv. State engagement: States are developing State Logistics Plans aligned with NLP to give policy focus at the State level. 26 States have notified their State Logistics policies. An annual "Logistics Ease Across Different States (LEADS)" survey is also deployed in all State and Union Territories.

v. EXIM Logistics: To streamline EXIM logistics, infrastructure gaps are addressed through action plans developed by the National Committee on Trade Facilitation (NCTF). NCTF Working Groups formulated a National Trade Facilitation Action Plan 2020-23. The action plan for 2024-26 is being developed.

vi. Services Improvement Framework: The Service Improvement Group has been established with the involvement of over 30 business associations. Critical issues are raised by associations on the E-LoGS platform.

vii. Sectoral Plans for Efficient Logistics: This aims to address the needs and challenges in the logistics sector, particularly of bulk and breakbulk cargo. Coal Logistics Plan and Policy was launched in February 2024. Comprehensive Port Connectivity Plan was prepared in 2022 that identified 107 port projects to strengthen connectivity between ports, railways, roadways, and inland waterways.

viii. Facilitation of Development of Logistics Park: Guidelines for Multi-Modal Logistics Park are being reviewed.

CONCLUSIONS AND OUTLOOK

12.77. Transformative changes have dawned upon the infrastructure landscape of India in the last decade in terms of facilitative institutional architecture and the quality and stock of infrastructure assets. The consistent focus on road, rail and air connectivity, sanitation and digital infrastructure have brought in a considerable growth in assets in these sectors.

12.78. However, infrastructure-creation efforts in India are predominantly public sector-led. As per the Infrastructure Monitor 2023 published by Global Infrastructure Hub and the World Bank, India's investment in infrastructure was largely funded by the public sector – which includes the Government agencies and state-owned entities and banks³¹. Between fiscal year 2019 and 2023, the Central and State Governments contributed to 49 per cent and 29 per cent of the total investments, respectively, while the private sector contributed 22 per cent³².

12.79. For India to continue down the path of building quality infrastructure, a higher level of private sector financing and resource mobilisation from new sources will be crucial. Facilitating this would not only require policy and institutional support from the Central Government, but State and Local Governments would have to play an equally important role. International experience shows us how initiatives at the sub-national level can facilitate resource mobilisation for infrastructure development. Examples include pooled financing mechanisms for municipal projects³³, specialised municipal intermediaries³⁴, asset recycling programs³⁵, tax increment financing³⁶ and land sales and development rights³⁷ among other innovative approaches. Each of the measures witnessed broad-based implementation, succeeding in mobilising finances for critical infrastructure projects.

12.80. As mentioned above, there is a need to improve data capture and reporting mechanisms for investments in infrastructure across instruments and sectors as well its composition across different projects on a granular level. The Rangarajan Commission Report on Infrastructure Statistics (2001) had underscored the importance of collecting and maintaining a reliable statistical database for the infrastructure sector. Major strides have been made since then to collect data on policy direction, institutional strength, project performance and monitoring. However, data gaps persist in some key areas.

³¹ Infrastructure Monitor 2023: Global trends in private investment in infrastructure, Global Infrastructure Hub

³² CRISIL Infrastructure Yearbook 2023

³³ Municipal Pooled Financing of Infrastructure in the United States: Experience and Lessons, the World Bank Group, June 2017. A municipal bond bank allows smaller municipalities to collectively access the financial markets, thus lowering cost of funds borrowed.

³⁴ Innovative Approaches to Municipal Infrastructure Financing, Commonwealth Library (based on the Vietnam experience). Local Development Investment Funds are operational and legal vehicles for provincial governments to mobilize funds and enter into contracts with the private-sector.

³⁵ Robust sector-specific pipelines enable effective asset-recycling program, Global Infrastructure Hub, November 2015 (based on the Australian experience). This mechanism allows the State Government to sell public assets to the private sector and utilise the proceeds for new infrastructure development.

³⁶ Report on the use of Tax Increment Financing, Prepared for Governor's Office of Planning and Research, State of California, December 2020. This is a subsidy given for redevelopment, infrastructure, and other community-improvement projects.

³⁷ Developing the Business and Financial District in Marina Bay, Lee Kuan Yew School of Public Policy at the National University of Singapore, 2016 (based on Singapore experience). The local government sold parcels of land and granted development rights to private participants for residential, commercial and mixed-use development.

- a. Existing databases fall short on assessing the demand for infrastructure and tracking the utilisation of facilities built in the sub-sectors. Demand aggregation can provide an insight into the appetite for infrastructure projects based on sub-sectors and regions, while the construction of an index that tracks the utilisation rates would shed light on sub-sectors where there is either an oversupply or shortfall of required infrastructure facilities. Addressing these two gaps can provide additional diagnostic measures for enabling policymakers and other stakeholders to optimally allocate scarce resources.
- b. Currently, statistics on the infrastructure sector can be derived from several available databases such as the National Infrastructure Pipeline, the PPP India Portal, heads of budget accounts and reports of the respective infrastructure focused ministries, fund flows of Central and State Public Sector Enterprises and financial flows to the infrastructure sector from Non-Governmental institutions such as Banks, NBFCs and the Capital Markets. These databases are useful to assess infrastructure statistics at the project level and to track financial flows at the sectoral level. However, when attempting to assess infrastructure spending and development across time based on the Harmonized List (HML) classifications for a macro-level overview, these databases fall short due to the lack of consistency in the frequency of data collection, lack of uniformity in the methodology followed and cross fund flows between institutions which can lead to double counting. This also makes comparing data from different sources difficult. Therefore, going forward, it would be useful if a mechanism is developed for consolidating infrastructure development and financial flow data from various sources, as per the HML classification, under a single access point which is updated at a regular frequency. It would also be of use to policymakers if the consolidated statistics are recorded with the public and private sector bifurcation.

CLIMATE CHANGE AND INDIA: WHY WE MUST LOOK AT THE PROBLEM THROUGH OUR LENS

13

CHAPTER

Addressing anthropogenic climate change has emerged as the top global priority, with multilateral bodies, experts, and the media calling for nations worldwide to do their part in mitigating a ‘climate catastrophe’ before it’s too late. India, having partaken in the collective effort, has made major strides over the last decade, yet continues to be labelled as one of the largest polluters in the world and is frequently chastised for not doing enough. However, the criticisms of the Indian approach fail to recognise two critical points. One, India is faced with balancing economic development along with meaningful climate action akin to its developing peers, and second, the proposed solutions to climate change, which serve as the basis for criticising India, ignore how sustainable living is built into the Indian lifestyle.

Rooted in the principles of sustenance, India’s ethos emphasises a harmonious relationship with nature, which is in sharp contrast to the overconsumption prevalent in other parts of the developed world. Solutions to address climate change are based on the principles of a market society, which seeks to substitute the means to achieve overconsumption rather than addressing overconsumption itself. Such an approach thus gives importance to the label under which their lifestyle can continue instead of bringing about a change in their lifestyle.

Over the years, this has produced a slew of policies that have unintended consequences for the planet, resulting in little or no reduction in carbon emissions. If India, with its large population, chooses to go down this path, the climate consequences for the country and the world will be hugely negative. Therefore, India needs to follow its own path and look at the problem through its own lens if the nation is to empower its citizens through economic development while simultaneously addressing the issue of climate change.

These considerations served as the foundation for Mission LiFE, a unique initiative announced by the Hon’ble Prime Minister at the 2021 UN Climate Change Conference. Mission LiFE seeks to bring individual responsibility to the forefront of the fight against climate change. Deriving its principles from ancient Indian philosophy, the tenets of this approach are based on making pro-planet choices without compromising on quality of life. It is about making deliberate choices in the present while remaining conscious of the generations to come. Mission LiFE seeks to address the ‘wants’ of the people without letting them hurt Nature.

INTRODUCTION

*Mata Bhumi Putroham Prithivyah
Earth is my mother and I am her son*

13.1. Sustenance is at the core of Indian ethos. This principle underlies our relationship with Nature, with other people, with materiality, and within ourselves. Recognising and buttressing such ethos is important in today's world since India now comes face to face with it in a shiny new wrapper and a limited scope, ironically mandated from the part of the world that has otherwise relied on overconsumption as a pathway to growth. As the clamour for sustainability resonates across the world, India finds itself surprised at the crossroads of having to address economically, what it has always believed and practised philosophically.

13.2. As the world's most populous country, currently globally the 5th largest economy, India is headed to become the 3rd largest by 2030. Naturally, this means that our energy needs are expected to grow - about 1.5 times faster than the global average in the next 30 years¹. Instead of appreciating the task at hand and the achievements already made by the country (Box 1), India is being called one of the largest polluters², and hectored to do more even as a significant portion of the world does less.

Box XIII.1: India's achievements against targets for climate change

- Successfully reduced the emission intensity vis-à-vis its GDP by 33% between 2005 and 2019, thus achieving the initial NDC target for 2030, 11 years ahead of scheduled time.
- Also achieved 40% of electric installed capacity through non-fossil fuel sources, nine years ahead of the target for 2030. Between 2017 and 2023, India has added around 100 GW of installed electric capacity, of which around 80% is attributed to non-fossil fuel-based resources.
- India's contribution to climate action is significant through its international efforts - International Solar Alliance (ISA), Coalition for Disaster Resilient Infrastructure (CDRI), creation of LeadIT, Infrastructure for Resilient Island States (IRIS), and Big Cat Alliance.

13.3. With Climate Change as the new North Star for the world, it is now well-established that 196 countries must meet their individual commitments under 'Nationally Determined Contributions' towards reducing carbon emissions 'to limit the global temperature increase to 1.5 degrees Celsius above pre-industrial levels'³. Since globally all efforts hover on channelling precious resources towards attaining this artificial golden mean, with little clear idea of what happens if it doesn't, it naturally begets the question - 'Is the strategy adopted, both optimum and in everyone's interest?'

13.4. This essay purports to examine this peculiar situation under three sections - assessment of global pathways to achieve climate change goals, inherent dissonance in the global strategy,

¹ IEA

² Why India is key to heading off climate catastrophe, Yale Climate Connections, May 2024 (<https://tinyurl.com/yfvahws>)

³ The Paris Agreement, adopted by 196 parties at the United Nations Climate Change Conference (COP21), December 2015

and the need for a complementary but more sustainable strategy centred on key tenets of existence (Mission LiFE).

CLIMATE CHANGE AND THE GLOBAL APPROACH

13.5. As the literature goes, greenhouse gas (GHG) emissions, particularly carbon dioxide (CO₂), primarily contribute to adverse climate change. The Intergovernmental Panel on Climate Change (IPCC)⁴ paints a dire picture - emissions pose a serious threat since CO₂, once released into the atmosphere, can hang for 300 to 1000 years⁵, causing global warming and environmental destruction such as the melting of polar ice caps.

13.6. To achieve the stated objectives, the world has adopted a strategy that comprises a set of pathways, popularly called ‘climate adaptation’ and ‘climate mitigation’. Most of this includes shifting to energy sources other than fossil fuels, enhancing energy efficiency through innovative and environment-friendly design, adopting regenerative and environmentally sensitive agricultural practices, as well as protecting and restoring the natural ecosystems (See Box XIII.2).

Box XIII.2: WEO-2023 proposes a global strategy for getting the world on track by 2030

The Five Key Pillars to this proposal include:

- Tripling global Renewable Energy Capacity.
- Doubling the rate of Energy Efficiency improvements.
- Slashing methane emissions from fossil fuel operations by 75 per cent.
- Innovative, large-scale financing mechanisms to triple clean energy investments in emerging and developing economies.
- Measures to ensure an orderly decline in the use of fossil fuels, including an end to new approvals of unabated coal-fired power plants.

WHY IS THE CURRENT APPROACH FLAWED?

13.7. To inform the design of emission-limiting pathways, IPCC has quantified the remaining carbon space available as the “carbon budget.” As per their estimates, from the beginning of 2020, the world has approximately 500 GtCO₂ left for a target of 1.5°C and 1150 GtCO₂ for a target of 2°C (with a likelihood of 50% and 67%, respectively). With each passing year, the budget gets smaller, and the time available to act slips away. Nations are then expected to commit to “*accelerated and equitable mitigation pathways*” while walking the tightrope of developmental demands. The alarmism sounds quite dreadful, with the IPCC stating, “*there is a rapidly closing window of opportunity to secure a liveable and sustainable future for*

4 The Intergovernmental Panel on Climate Change Sixth Assessment Report (IPCC AR6) states, “Human-caused climate change is already affecting many weather and climate extremes. This has led to widespread adverse impacts on food and water security, human health and on economies and society”. The half-life of CO₂ and a stock of the damage already caused has thus given rise to a need for collective action if we are to limit temperature rises and the consequent environmental damage.

5 The Atmosphere: Getting a Handle on Carbon Dioxide, Alan Buis, NASA’s Jet Propulsion Laboratory, October 2019 (<https://tinyurl.com/4hjfxzev>)

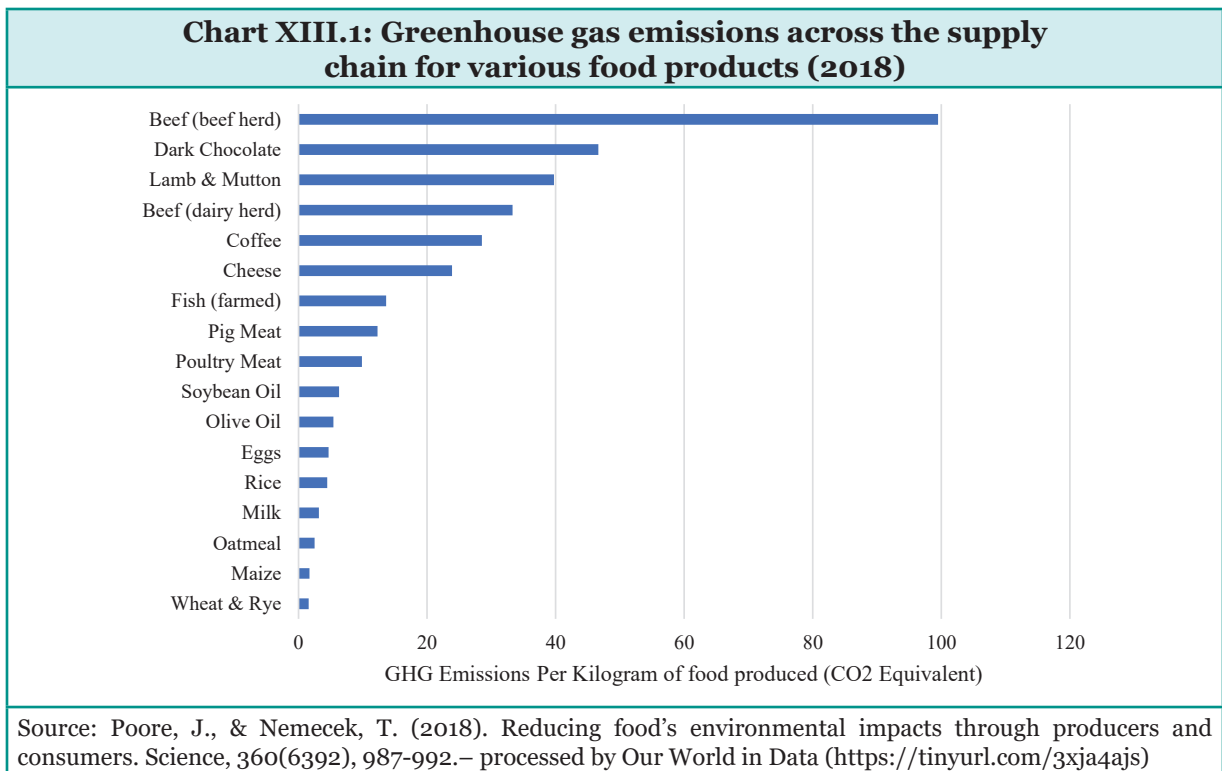
all”. Such forebodings notwithstanding, the purported climate solution has some fundamental issues.

Little principled understanding of laws of Life

13.8. Life exists only in the form as we know it today. Hence, any strategy that aims to confuse man-made actions as entire solutions by themselves is extremely short-sighted in nature. Ultimately, we cannot ignore the reality that we come from nature, and the systems required for life must necessarily be linked to the organic flow of nature and life. No artificial mechanism is a workable system in its entirety because as much as we can ingeniously tinker with manufacturing processes, two simple principles stand paramount- 1) Humans cannot create a new element, cannot change any law of nature, and cannot synthesise a process that doesn't take or release to the environment. 2) Fundamentals of existence remain the same eternally. This means humans will continue to want oxygen, water, and food in the form we know it. Yet, we continue to disrupt the same for both us and other species. That's why the adopted strategy for addressing climate change suffers from foundational issues.

13.9. Climate change strategies continue to be prescriptive in the acceptable mandates for geographically, economically, and climatically different countries. Without cross-learning, many natural ideas relevant to sustainable development, such as consumption patterns, lifestyles, plant vs meat-based diet, etc., are not factored in.

13.10. Globally, Power and Transport industries have the maximum contribution to GHG emissions, followed by Industrial combustion, Agriculture, and Waste industries. Of the latter, Beef production has the highest emissions per kilogram of food product as seen in Tab XIII.1. Despite this, there is not even a call for change, let alone a mandate.



13.11. The entire developed world uses toilet paper made of ‘virgin wood’ for the most regular body activity, every single day, multiple times over. One of the best global sustainability blogs ‘TreeHugger’ states that ‘Making one single roll of toilet paper uses 1.5 pounds of wood⁶, 37 gallons of water and 1.3 kWh of electricity. Many Asian countries provide valuable lessons around these, yet their non-capitalist strategies often remain excluded from mainstream discussions because Behavioural and Lifestyle Change seems to be more difficult than Climate Change.

13.12. Man, and Nature (gross forms of Purush and Prakriti in the Samkhya Tradition) are indestructible entities that interact to provide meaning to consciousness in the form of reality as we know it. Hence, any strategy that aims to alter things far beyond the comprehension or control of man, such as ensuring that the planet’s temperature doesn’t cross 2 degrees Celsius, must travel the journey inwards and not outwards.

Ignores the interconnected nature of existence

13.13. Climate is nature’s reality so inherently interconnected in ways that science hasn’t even discovered its nuances. Surprisingly, our accepted pathways seem to ignore this unmissable reality to focus on siloed solutions, unintegrated with natural value chains. A case in point is the substitution of energy – to renewables from fossil fuels.

13.14. There is hardly any inequivalence foundationally between extracting earth for one resource over another. Solar panels may generate renewable energy, but solar batteries are formed of materials extracted from the earth’s crust⁷, particularly Lithium, Cobalt, Nickel, and some rare earth minerals⁸. According to some estimates⁹, this not only leaves ‘large scars in the landscape’ but requires substantial water, releasing about 15 tonnes of CO₂ per tonne of mineral¹⁰. Bringing the extracted ore to usable forms requires heat between 800-1000 degrees Celsius¹¹, temperatures that can, ironically, be cost-effectively brought out by only burning fossil fuels (Chart XIII.2).

13.15. Cobalt and Copper, used extensively in Li-ion batteries, electric vehicles, and mobile phones, have a raging sustainability crisis at the heart of their extraction. About four-fifths of the world’s cobalt supply is buried deep within a single country that is also one of the world’s poorest – the Democratic Republic of Congo (hereafter referred to as Congo). About 80% of the country’s cobalt production is controlled by Chinese companies who refine in China, and subsequently sell to battery manufacturers globally. Siddharth Kara, a fellow at Harvard’s T.H Chan School of Public Health, states in his book ‘Cobalt Red’ that much of Congo’s Cobalt extraction is done by “artisanal miners” – a new-age euphemistic term for freelance workers

6 Stop Using Toilet Paper; Get the Blue Bidet, Treehugger, October 2018 (<https://tinyurl.com/3rmjz8kn>)

7 Most of the minerals extracted are from hard rock mines or underground brine reservoirs through a process that requires energy generated from CO₂-emitting fossil fuels.

8 Some of the magnets used in their production comprise rare earth minerals like neodymium-iron-boron (NdFeB) and samarium cobalt (SmCo). They are not ‘rare’ in the actual sense of the word but abundant in the earth’s crust. However, since they occur in relatively low concentrations in the ores compared to other normally extractable metals, they pose significant difficulty in mining and refining, which again does huge damage to the environment.

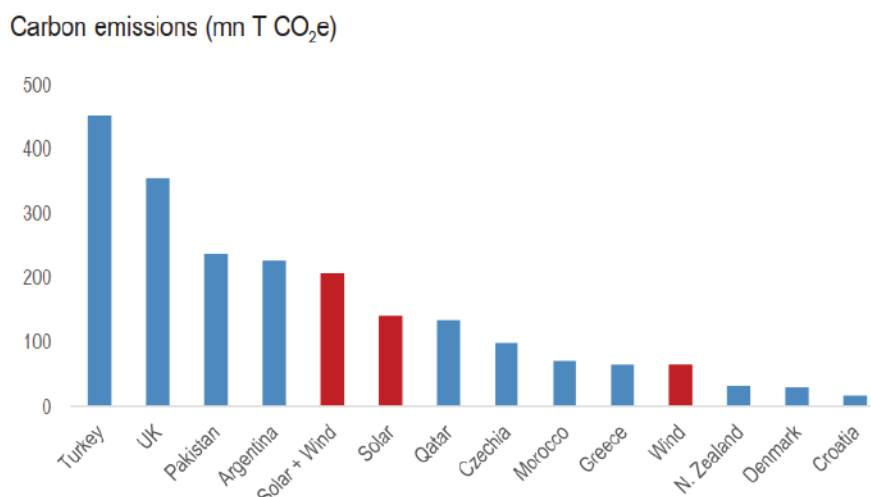
9 The new ‘gold rush’ for green lithium, BBC, November 2020 (<https://tinyurl.com/mrjsuw9w>).

10 Analysis by raw materials experts Minviro for the lithium and geothermal energy firm Vulcan Energy Resources.

11 How much CO₂ is emitted by manufacturing batteries?, MIT Climate Portal, March 2022 (<https://tinyurl.com/pvbxkx44>).

who work in dangerous mines for the equivalent of few dollars a day¹². It is sad and ironical that all of this is done in the name of sustainable electric vehicles, which may contain up to 3.5 times as much copper as a gas powered cars¹³.

Chart XIII.2: Energy Intensity of Transition



Source: J.P. Morgan Global Energy Strategy: The Energy Transition (April 2024), Figure 8: Energy Intensity of transition, Page 6

13.16. The generative value chain of ‘clean energy’ products such as solar panels and windmills, stretching from mining to manufacturing to transportation to use to the last stage of disposal, has similar emission effects as other fuels would, depending on material and distances travelled. Additionally, it consists of the disruption of existing supply chains made over decades and creating new pathways involving monumental environmental externalities such as emissions during extraction, transportation, the establishment of new factories involving new land, machinery production, and ancillary development, transportation of mobile renewable units to individual consumers, rendering existing infrastructure and pathways redundant.

13.17. For example – switching to EVs requires uprooting the existing network of petrol pumps and creating a new network of charging stations involving all of the above. Unfortunately, all of these “hidden costs” – both from a monetary, and an environmental perspective are not accounted for in the lifecycle costs when advocating for the displacement of fossil fuels with renewable options. Their greatest ‘climate-friendly’ emission control rests only in end-user emissions, which makes the comparison of climate costs across the options incomparable.

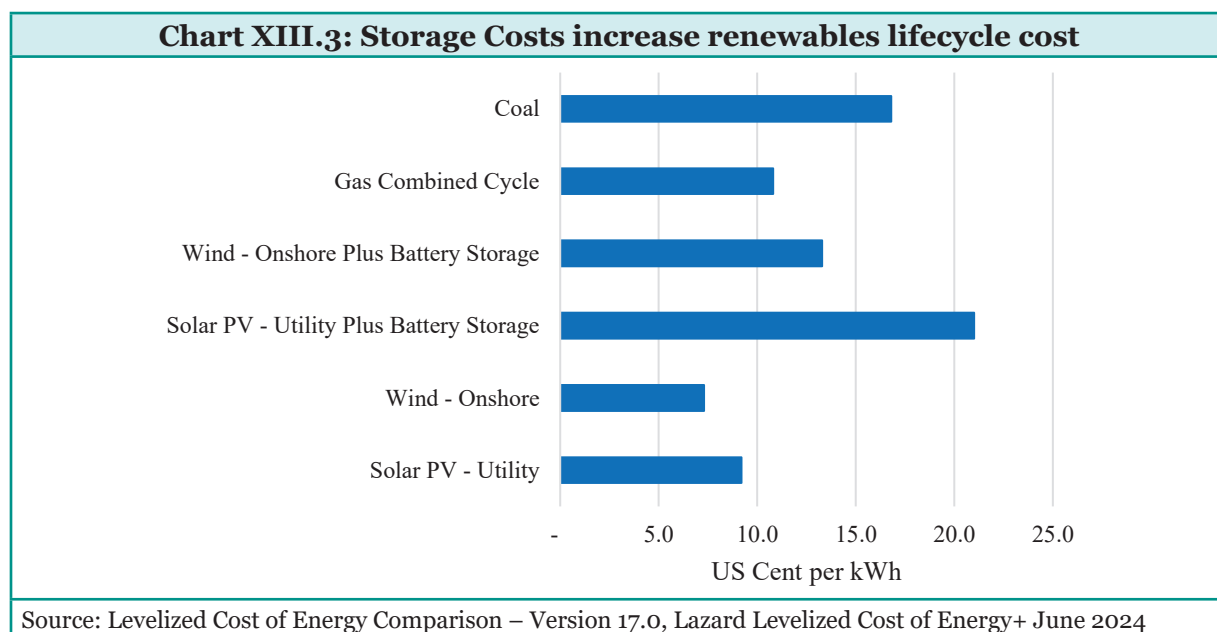
13.18. There is not enough research on how much the end-to-end lifecycle costs. Land is finite, but demand is not. Solar can need 300 times as much space as nuclear, and biomass more than 8,000 times¹⁴. At the same time, wind turbine blades and solar panels have to be replaced every couple of decades, resulting in potentially enormous waste problems. Apart from space and

¹² How ‘modern-day slavery’ in the Congo powers the rechargeable battery economy, NPR, February 2023 (<https://tinyurl.com/28nuum3e>).

¹³ In Congo’s Cobalt Mines, Nicolas Niarchos, The New York Review, December 2023 (<https://tinyurl.com/tfphf988>).

¹⁴ Climate action: Our energy transition need not follow preset pathways, V. Anantha Nageswaran & Bjorn Lomborg, 21st February 2024 (<https://tinyurl.com/5bv5272t>)

waste issues, the main challenge preventing swift transition is that solar and wind power are only cheaper than fossil fuels when the sun shines and the wind blows. Industrialisation and development require power and energy 24/7. Even factoring in four hours of storage makes solar and wind go from the cheapest power available to much more expensive than gas and coal power (Chart XIII.3).



13.19. Moreover, to provide firmly reliable power, studies¹⁵ show that a 100% solar and wind system would need a large storage capacity, which is impossibly expensive. Overall, there are critical sustainability issues connected to the production of wind turbines, solar photovoltaic modules, electric vehicles, and lithium-ion batteries, such as the use of conflict minerals, toxicity, limited availability or supply chain governance issues of rare earth elements, cobalt & lithium¹⁶. What the strategy excludes is indeed as noteworthy as what it includes.

Insufficient for the ordained purpose

13.20. In normal parlance, energy and power are often used interchangeably. However, their difference is another factor that makes climate change strategy a difficult one to follow. Matthew L Wald, an independent energy analyst, says in ‘The Myth of Solar Power’:

“In November 2022, France passed a law requiring that all parking lots with 80 spaces or more install roofs with solar panels to cover at least half the spaces. According to estimates, the initiative will result in 11 GW of power—an amount, Grist gleefully reported, that would be enough to power 8 million homes. In fact, it’s enough to power zero homes.

If you have a small rooftop solar panel that can generate 50 watts of power, it wouldn’t matter how long the generator runs for or how much energy it produces and stores—on a

¹⁵ Fekete, B. M., Bacskó, M., Zhang, J., & Chen, M. (2023). Storage requirements to mitigate intermittent renewable energy sources: analysis for the US Northeast. *Frontiers in Environmental Science*, 11, 1076830.

¹⁶ Huber, S. T., & Steininger, K. W. (2022). Critical sustainability issues in the production of wind and solar electricity generation as well as storage facilities and possible solutions. *Journal of Cleaner Production*.

very sunny day in Arizona in the summer, for example, it might be able to produce 300 watt-hours, or 0.3 kilowatt-hours, over a 24-hour period—at any given moment, it would only be able to power two of the lightbulbs.”

13.21. Vaclav Smil goes so far as to say in a 48-page report¹⁷ published by Fraser Institute, “Net Zero Carbon is a highly unlikely outcome”.

“In terms of final energy uses and specific energy converters, the unfolding transition would have to replace more than 4 terawatts (TW) of electricity-generating capacity now installed in large coal- and gas-fired stations by converting to non-carbon sources; to substitute nearly 1.5 billion combustion (gasoline and diesel) engines in road and off-road vehicles; to convert all agricultural and crop processing machinery (including about 50 million tractors and more than 100 million irrigation pumps); to find new sources of heat, hot air, and hot water used in a wide variety of industrial processes (from iron smelting and cement and glass making to chemical syntheses and food preservation) that now consume close to 30 percent of all final uses of fossil fuels; to replace more than half a billion natural gas furnaces now heating houses and industrial, institutional, and commercial places with heat pumps or other sources of heat; and to find new ways to power nearly 120,000 merchant fleet vessels (bulk carriers of ores, cement, fertilizers, wood and grain, and container ships, the largest one with capacities of some 24,000 units, now running mostly on heavy fuel oil and diesel fuel) and nearly 25,000 active jetliners that form the foundation of global long-distance transportation (fuelled by kerosene)... On the face of it, and even without performing any informed technical and economic analyses, this seems to be an impossible task given that:

- *We have only a single generation (about 25 years) to do it;*
- *We have not even reached the peak of global consumption of fossil fuels;*
- *The peak will not be followed by precipitous declines;*
- *We still have not deployed any zero-carbon large-scale commercial processes to produce essential materials;*
- *The electrification has, at the end of 2022, converted only about 2 per cent of passenger vehicles (more than 40 million) to different varieties of battery-powered cars, and that decarbonisation is yet to affect heavy road transport, shipping, and flying.*

Earth has enough for needs but not for greed

13.22. The current Climate Change strategy seems to say that given that our energy needs will continue to rise, we must try replacing conventional fuel with renewables and clean energy – thus making it a substitution issue rather than a global lifestyle issue. This replacement must be done only in the way we know – through swapping of one preferred industry to another, through the creation of new transportation and supply lines in place of existing ones, to penalising the low-emitters with disproportionately higher payments.

13.23. What this strategy doesn't do is attack the root of the problem – overconsumption, which is starker among developed countries. Moreover, do each of us really need multiple screens, even if they are charged by renewable energy sources, or must everyone fly off to

¹⁷ Halfway Between Kyoto and 2050: Net Zero Carbon is a Highly Unlikely Outcome, Fraser Institute, May 2024.

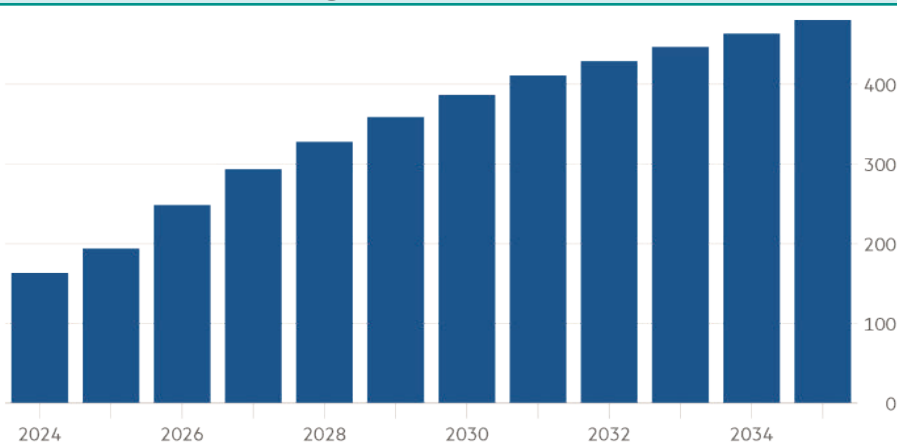
a fancy destination in fancy planes for a great conversation on reducing climate impact, or that we must eat for taste what we shouldn't eat for health or environment. As Derek Bower says in FT¹⁸, *“If we want oil companies to stop selling fossil fuels, we should consume less of them and we should vote for governments that make them more expensive, not less. Yes, our physical infrastructure has been built over decades around petroleum use. Yes, oil companies have lobbied forever to preserve this arrangement and slow down alternatives. But no one is compelling those of us in the rich world to fly so much, drive Escalades, devour so much meat, or buy so much stuff.”*

13.24. It doesn't encourage a genuine cathartic approach to nature but instead focuses on creating another industry out of sustainability – instead of imbibing sustainable practices in the way we live, we worry more about carrying PETA labels on our bags. The fact of the matter is organisations, people, and countries are less bothered about ensuring virtuosity in the process of production than about getting a “Fair Trade” global label in the fear of being shut out of premium places. This exclusive club does not question the drive towards overconsumption – more energy, more video entertainment, more houses, more transportation but questions the labels under which this happens. That is the hypocrisy in-built under the modern climate change strategy.

Global pursuit of energy-guzzling technologies

13.25. On the one hand, developing nations are forcefully nudged to sign up for climate commitments that they are not ready for. On the other hand, the developed world is in a mad ‘Scramble for Africa’ kind of rush to usher in the latest and the most expansive AI (Artificial Intelligence) ecosystem. The fact is that AI is an energy guzzler. Even as the data centres are ramping up energy demand, cloud storage facilities, crypto mining, and AI are all expected to increase this exponentially (Chart XIII.4).

Chart XIII.4: Power Demand from data centres and other large loads (in Tera-watt hours)*



Source: Financial Times (<https://tinyurl.com/4teb29ck>); S&P Global Commodity Insights

*Includes cryptocurrency mining and manufacturing facilities and electrification of oil and gas operations

¹⁸ The Energy Transition will be volatile, Financial Times, accessed on 25th June 2024 (<https://tinyurl.com/52syuz7j>).

13.26. As per a broad estimate by the International Energy Agency, a single Chat-GPT search consumes 10 times more energy than a similar query on Google. One large data centre in Iowa owned by Meta is estimated to burn just in one year, the equivalent of 7 million laptops working 8 hours a day¹⁹. FT reports that power demand from data centres globally could reach up to 1,000 TWh by 2026 (Chart XIII.4). To put this figure in perspective - Germany's and France's net power demand today is roughly around 500 TWh each respectively²⁰. Elon Musk, most famously said recently at Bosch Connected World Conference, "*I've never seen any technology advance faster than this. The chip shortage may be behind us, but AI and EVs are expanding at such a rapacious rate that the world will face supply crunches in electricity and transformers next year*". By 2034, global energy consumption by data centres is expected to top 1,580 TWh, about as much as is used by all of India²¹.

13.27. This electricity demand is rising more exponentially than green energy production can keep pace with. Already, there seems to be a movement to push away green commitments and delay retiring of some coal-fired plants – in the Salt Lake City region, a coal plant retirement has been pushed back by a decade to 2042 and another delayed to 2036. While there are talks by tech leaders of attempting nuclear fusion startups to power the tech's *Bakasur*²² -like hunger, practically, it seems to be much farther away in the future, given that the solution is not yet viable.

13.28. The incompatibility of the two major movements of AI and Green energy being pushed by the West is not unseen by the global world. It seems like little thought has been put into the inevitable discordance in the chosen economic and sustainable strategies.

Pretends to be data-driven but is shy of per-person data

13.29. It is said that India is the 3rd largest emitter after the US and China and, therefore, is repeatedly asked to accept a greater share of responsibility. What is constantly de-emphasised is that since the period of the first settlement of societies, western nations with a forward position on the industrial revolution indulged in fossil-fuelled development with reckless abandon that led to the position the world is in today. Despite advocacy by developing nations on this, a sanitised reference to 'historical emissions' is submerged deep within abstruse literature and is met with a casual indifference towards its real role and impact on the emerging countries' climate targets. Even copious amounts of data inundation cannot change a basic fact: energy is a per-capita phenomenon. To put it simply:

*Energy Consumption (at time T) = Energy consumed by 1 person (E1) * Number of people (N) + Energy consumed by common activities required for N (EN)*

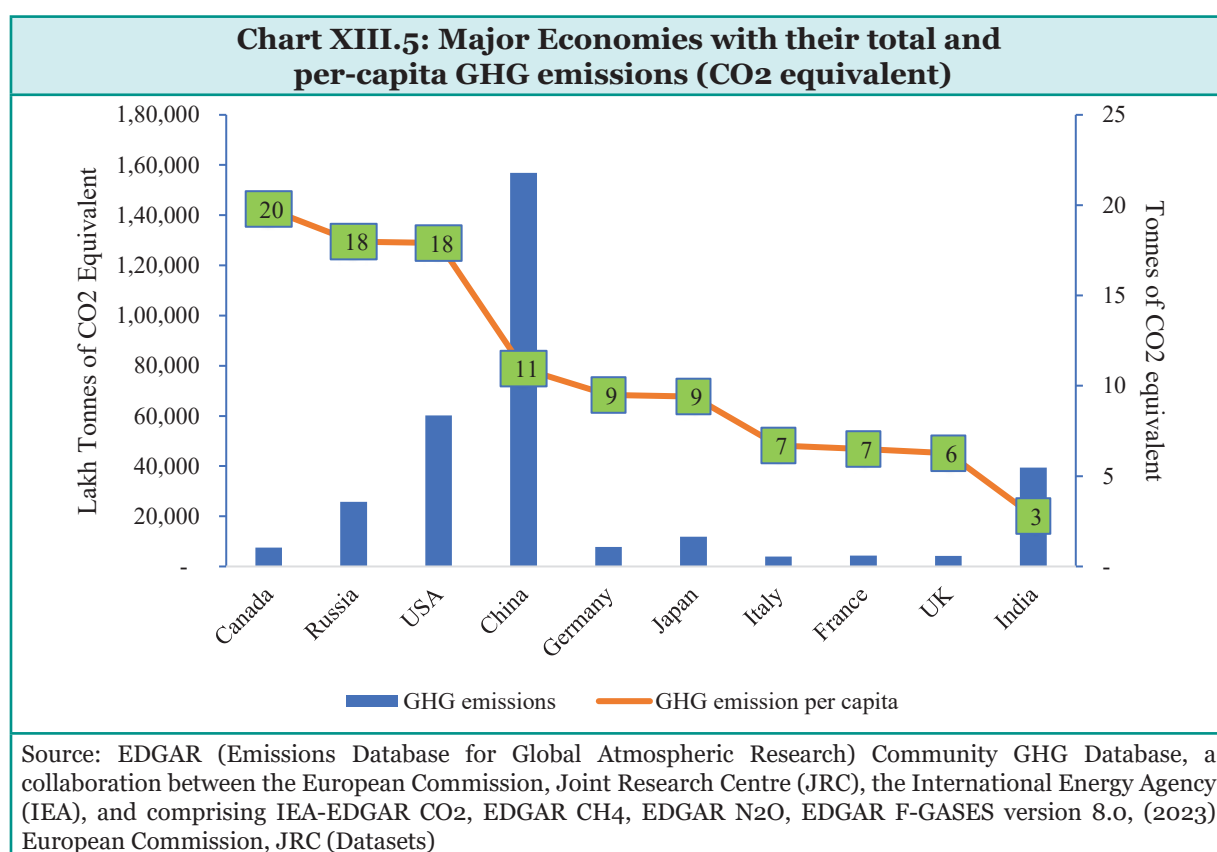
19 AI is exhausting the power grid. Tech firms are seeking a miracle solution, The Washington Post, June 2024.

20 Statistisches Bundesamt Gross Electricity Production in Germany and RTE France Electricity Analysis and Data, Accessed on 8th July, 2024.

21 AI is already wreaking havoc on global power systems, Bloomberg, June 2024 (<https://tinyurl.com/56494s6a>).

22 Bakasur is a figure from Indian Mythology, symbolizing limitless hunger and greed. The demon would force the king of the city to send him an unending supply of food every day, which he promptly devoured along with the people who delivered it to him.

13.30. Because all modern policy-making starts from baseline assessment, it is essential that the climate target for each country is proportional to its economic status. On the contrary, it is observed that the top 10% of the per-capita emitters averaged 22 tonnes of CO₂ in 2021, which is over 200 times what the bottom 10% emits²³. 85% of the current largest emitters live in advanced economies like the US, Europe, and China, and the bottom 10% of emitters live in developing countries of Africa and South Asia where even access to electricity is a challenge²⁴. Illustrating this stark difference in per-capita consumption and emissions, the Economist highlights that the average African consumes 185 kilowatt-hours (kWh) a year while Europe and the United States consume 6500 kWh and 12700 kWh, respectively²⁵. On the contrary, India's historical cumulative emissions and per capita emissions are very low despite being home to more than 17% of the global population – contributing only about 4% of the global cumulative greenhouse gas emissions between 1850 and 2019 (Chart XIII.5).

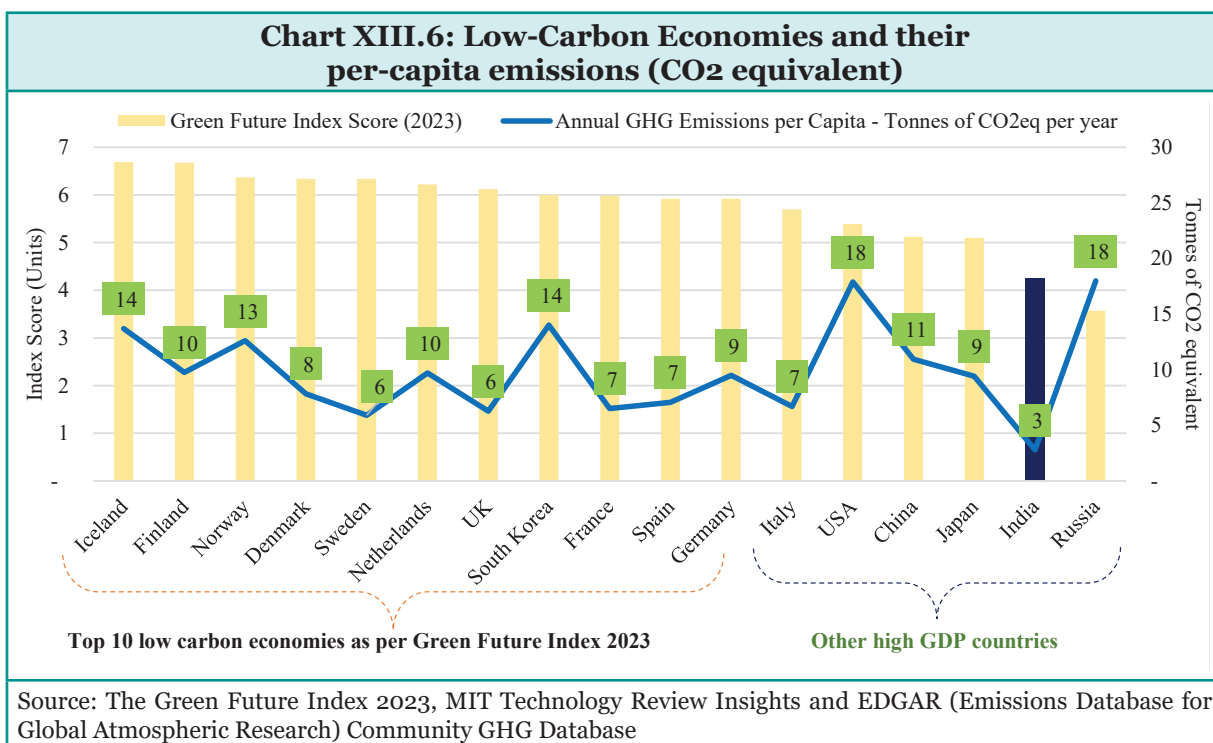


13.31. In this wonderland, Alice would have remarked, '*Curiouser and Curiouser*' – for even though global comparison of countries uses data such as per-capita income or per-capita consumption, the same is not followed while assessing energy emissions, even when it is directly dependent on per-person use. Countries assumed to be 'greener' by various international indices turn a dark shade of brown when the filter of per capita is applied.

²³ The world's top 1% of emitters produce over 1000 times more CO₂ than the bottom 1%, IEA, February 2023 (<https://tinyurl.com/bdtf4tda>)

²⁴ IEA estimates state that as of 2022, approximately 774 million people lacked access to electricity, with more than 80 per cent of them living in Sub-Saharan Africa; Data & Statistics – IEA (<https://tinyurl.com/4atwv4d2>).

²⁵ Africa will remain poor unless it uses more energy, Published in The Economist (<https://tinyurl.com/yzpkzecm>).



13.32. Comparatively, India’s per capita emissions have consistently remained low between 2.5 and 2.8 Tons CO₂eq/ year, despite substantial economic growth over the last decade. Per capita emissions of EU27 nations (8 Tons CO₂eq/ year)²⁶ were almost 3 times that of India. Even in the three scenarios for demand estimation employed by World Energy Outlook 2023, it was reported that the ‘per-capita energy demand of emerging countries remains well below that of developed countries, even by 2030’²⁷. A point that casually falls through the crevices in the discussions around climate change.

13.33. With such extreme disparities and large and persistent inequalities in historical and current global energy consumption, the targets and strategies for the attainment of zero emissions should not be dictated or mandated. It is important for countries to take ownership of the climate problem and work through a collaborative approach for meaningful climate action, unencumbered by external pressure or excessive criticism.

Historical Blindspot and a surprising lack of Guilt

13.34. Globally, there seems to be a tendency to overburden oneself with the need to set right today, the wrongs of the past. This is also complemented by a moralistic angle taken by the developed world on governance and policy towards countries with different understandings, including sustainability. However, in the case of climate change, where the data is as clear as

²⁶ Emissions Database for Global Atmospheric Research, GHG Emissions of all world countries 2023 Report

²⁷ “Global energy demand per capita is around 80 gigajoules (GJ) today, a level that has remained broadly stable over the last decade (Figure 3.3). It remains stable in the STEPS (Stated Policies Scenario) to 2030, but it declines by 7% in the APS (Announced Pledges Scenario) and by 15% in the NZE (Net Zero Emissions) Scenario. In advanced economies, per capita demand declines in all scenarios to 2030. In emerging market and developing economies, it continues to rise in the STEPS as economic growth drives an increase in energy services demand.” IEA World Energy Outlook 2023, Figure 3.3: Energy intensity and energy per capita in selected regions in the Stated Policies and Announced Pledges scenarios, 2022 and 2030.

chalk and cheese, the origin of the problem and the actual privilege enjoyed for a large number of decades (exploiting resources with a gay abandon to achieve economic progress) are also ignored. As Alice says in her Wonderland²⁸, “*But that's just the trouble with me. I give myself very good advice, but I very seldom follow it.*”

13.35. A significant disparity in energy access and carbon footprints can be observed among developed and developing countries. While developed nations have built their infrastructure at a leisurely, uninterrupted pace, many countries in Africa and South Asia are still striving to achieve regular electricity supply in urban areas. About 55 per cent of the population in least-developed countries still lack access to electricity²⁹. Research alludes that high-income countries use 6 times more resources and generate 10 times larger climate impacts than low-income countries.³⁰ This disparity makes it unfair to have a single deadline for zero emissions across countries.

13.36. Low- and middle-income countries face triple threats in terms of increasing energy demand, unaffordable costs of clean technologies, and a deep dependence on fossil fuels. This calls for a genuine recognition by developed nations of their historical contribution to environmental degradation and transfer of resources, technology, as well as technical capacity to developing countries which helps in closing the financing gap and progressing towards the shared goal of combating climate change.

Inadequate climate financing

13.37. The West turns a March Hare³¹ - *I have an excellent idea! Let's change the subject* - every time the subject of real climate financing due to historical reparations comes into play. Research shows that developing countries require ~USD 6 trillion by 2030 to achieve just about half of their existing NDC targets. Against this, only USD 100 billion was pledged by developed countries till 2020³², of which only USD 83.3 billion was provided³³. This level of financing still does not match up to the scale of the challenge faced – climate adaptation needs of developing countries are expected to reach USD 300 billion by 2030 and USD 500 billion by 2050³⁴, which is 5-10 times greater than the current fund flows.

13.38. Robert Burns in his poem says “*There is no such uncertainty as a sure thing*”. The surety of such climate pledges looks far more problematic once the lens is zoomed. Most of the current funding comprises loans to middle-income countries that are already struggling with heavy public debt burdens to meet their essential service requirements. Over two-thirds of the climate finance received by middle-income countries between 2015 and 2020 was in the form of loans³⁵. Moreover, profits and returns on investments are often prioritised over long-term

28 Alice in Wonderland by Lewis Carroll.

29 UNCTAD calculations based on data from the International Energy Agency and UNCTADstat (<https://tinyurl.com/53cxctsz>).

30 Global Resources Outlook 2024, UNEP.

31 Alice in Wonderland by Lewis Carroll

32 A climate finance goal that works for developing countries, UNCTAD, June 2023 (<https://tinyurl.com/2vpxe86k>).

33 Climate Finance and the USD 100 billion goal, OECD (<https://www.oecd.org/en/topics/climate-finance-and-the-usd-100-billion-goal.html>)

34 UNEP Adaptation Gap Report 2020

35 Climate finance programme funnelling billions of dollars back to rich countries, Frontline Research, May 2024 (<https://tinyurl.com/ycyp7ybv>)

environmental sustainability during fund allocation.

13.39. They say the devil lies in the details. Under the golden wrapper of a committed USD100bn financing, the elves are at work polishing the quirks, as is evidenced in this small fact reported by Hindustan Times³⁶ - At the Cartagena Ad Hoc Work Programme (AHWP) talks — in the run-up to the actual negotiations at the Conference of Parties (CoP) — the United States and other western countries have reportedly pushed to make the New Collective Quantified Goal (NCQG) contributions “voluntary” for those who “choose to pay”. They have also advocated widening the pool of contributors to include developing nations based on the latter’s “economic realities” and “current emission share”. So, the reason behind this vacillation on ‘Who’s to pay’ is well-indicated through Box XIII.3.

Box XIII.3: Willingness to Change and Willingness to pay for Environmentally Sustainable Policies

One would imagine that given most of the climate sustainability debate largely stems from the developed world, they would be the first ones to accept the financial impact of changing their consumption-oriented lifestyle. However, research says otherwise. Almost 63% of respondents of the OECD Environmental Policies and Individual Behaviour Change Survey in 2022 (administered to over 17,000 households) feel that sustainable choices should not impact them financially and therefore ‘they are unwilling to pay extra’. Contrast this directly with the CBAM tax that EU is willing to impose on products such as steel, for the so-called ‘fair price on carbon emitted’ during production, imported from developing countries. In the same survey, ~43% of respondents reported regular consumption of red meat and showed resistance to changing this lifestyle attribute with a large impact on climate change. The analysis further indicates that households’ general proclivity to the environment, does not influence their frequency of red meat consumption.

At this rate, the question seems less about sustainable choices, but more about a new play for capitalism. Having exhausted the extant industrial networks and saturation in product consumption, one can only create space for a whole new dynamic of industrial consumption - new industrial products, new markets, and new ways of taxing the ones still struggling to survive, so that the old status quo keeps thriving, and the ‘emerging’ are in a perpetual state of question.

ADOPTING THE WESTERN PRACTICES HAS NEGATIVE ENVIRONMENTAL IMPLICATIONS FOR THE DEVELOPING WORLD

13.40. With the largest population in the world, India has only the 7th largest area, culminating in a significant resource constraint. And yet this country consistently delivers not only on sustaining its vast population but also on touching the pinnacles of an aspirational society. The authors would like to argue that a principal reason for this inherent ability of the country to be resilient to economic, social, and historical challenges, is its inherent ‘Dharmic’ nature that

³⁶ Retrieved from Hindustan Times (<https://tinyurl.com/2zpr2rfn>)

makes it want to become an efficient Market Economy, but not a Market Society. The difference between the two was first described by Karl Polanyi, who described the two³⁷ as follows:

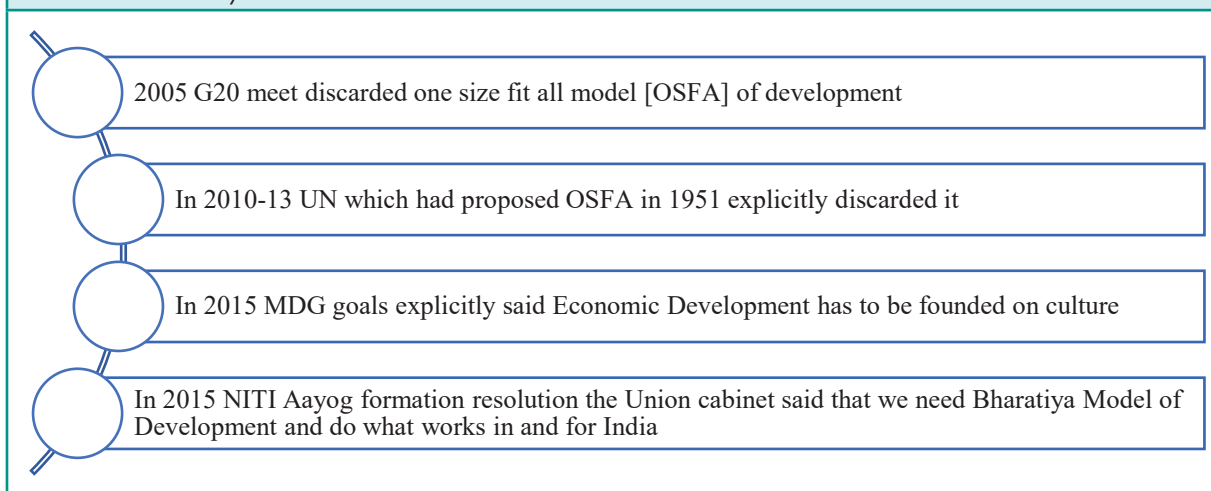
“This institutional gadget, which became the dominant force in the economy—now justly described as a market economy—then gave rise to yet another, even more extreme development, namely as a whole society embedded in the mechanism of its own economy—a market society.”

13.41. Simply put, a market economy - dominating the world economy today- is centred on the notion that supply and demand drive the production of goods and services, and prices are derived from the ‘invisible hand of free markets.’ A market society is often the culmination of a long-standing culture of market economics, whereby the social mores become heavily permeated by market values, leading to the commodification of areas that were traditionally governed by non-market norms.

13.42. India is not only not a market society but also at its root, a unique society where our culture, economy, societal norms, and environment are interlinked in a circuitous manner. As the forces foreign to us continue to shape our thought processes, India must be cautious in changing both lifestyle and user behaviour learning from societies different from ours, lest it impacts us in the future on 3Es - Equity, Environment, and Economics.

13.43. That market economics must not follow a universally-designed golden mean and must adapt to local conditions, is a point brought out well on several international platforms such as the 2005 and ensuing G20 declarations, the 2010-13 UN agreement that explicitly discarded One-Size-Fits-All (OSFA) and the 2015 Millennium Development Goals (Chart XIII.7).

Chart XIII.7: International Declarations that committed to different ideas



13.44. It’s time to acknowledge the market economy’s limitation in achieving emissions mitigation. Market discipline exists in theory as seen in numerous financial market busts. The market mechanism is pro-cyclical. Hence, it foments instability rather than being a force for stability. It seldom rewards a ‘good choice’ principally, but always the good choice financially.

³⁷ For more description on the subject, the paper by Frank Cunningham serves as a revelatory read: <http://individual.utoronto.ca/frankcunningham/marketEco.pdf>

The Meat Production Process and the destruction of the food-feed balance

13.45. Meat, due to its calorie density, has played a catalytic role³⁸ in the evolution of humans and was an important source of nutrition until the development of agriculture approximately 10,000 years ago. As societies settled and civilisations oriented around agriculture emerged in various parts of the world, the human race moved to a blend of plant- and animal-based cuisines over time. With time, improvements in agricultural research facilitated a significant expansion of the available plant-based food options, which are rich in nutrients and offer significant health benefits. Agricultural research has made it so that today, if one chooses to do so, it is completely possible for a human to meet all the nutritional requirements of their body from an exclusively plant-based diet and live a long, healthy life.

13.46. However, since the preference for meat is part of our evolutionary process and our digestive systems being clearly selected for an omnivorous diet, meat remains an important part of the nutritional mix. As societies moved towards affluence, the quantity of meat demanded also rose. North America and Europe saw their meat production grow by 2.5 times and 1.7 times, respectively, between 1961 and 2000³⁹. More important is the fact that increased production in these regions was facilitated by the emergence of the modern mass-scale feed industry, which now presents a credible and significant threat to food security around the globe.

13.47. The feed industry has emerged as such a massive undertaking that 33 per cent of the total arable land on the planet is now being utilised for feed crop production⁴⁰, and new land being added through deforestation⁴¹ or repurposing existing farmlands⁴². Further, the reliance on human-edible crops under the Western method of meat production has set into motion a food-feed competition⁴³ as more than one-third of the global cereal produced is utilised as animal feed. At the same time, one in ten humans still do not get enough to eat⁴⁴.

13.48. A recent analysis published in 'Nature' highlighted that only 37 per cent of the harvested area of major crops is used for direct food consumption,⁴⁵ while a large share of the human-edible crops is now facing competing uses, primarily from the livestock industry. This is because 1 kilogram of beef requires 25 kilograms of feed crop while 1 kilogram of lamb requires 15 kilograms of feed crop⁴⁶. Among the crops serving as the primary source of feed in the Western

38 Despite our ancestors being "hunter-gatherers", it is often believed that foraged plants were relied upon as fallback options when meat availability was scarce.

39 Food and Agriculture Organization of the United Nations

40 Livestock's Long Shadow: Environmental Issues and Options, Food and Agriculture Organization of the United Nations.

41 Demand for meat is destroying the Amazon, The Washington Post, March 2022. (<https://www.washingtonpost.com/climate-solutions/2022/03/09/amazon-rainforest-deforestation-beef/>)

42 Livestock and Landscapes, Food and Agriculture Organization of the United Nations. (<https://www.fao.org/4/ar591e/ar591e.pdf>)

43 Makkar, H. P. S. (2018). Feed demand landscape and implications of food-not feed strategy for food security and climate change. *Animal*, 12(8), 1744-1754.

44 Hannah Ritchie, Pablo Rosado and Max Roser (2023) - "Hunger and Undernourishment" Published online at OurWorldInData.org. Retrieved from: (<https://ourworldindata.org/hunger-and-overnourishment>)

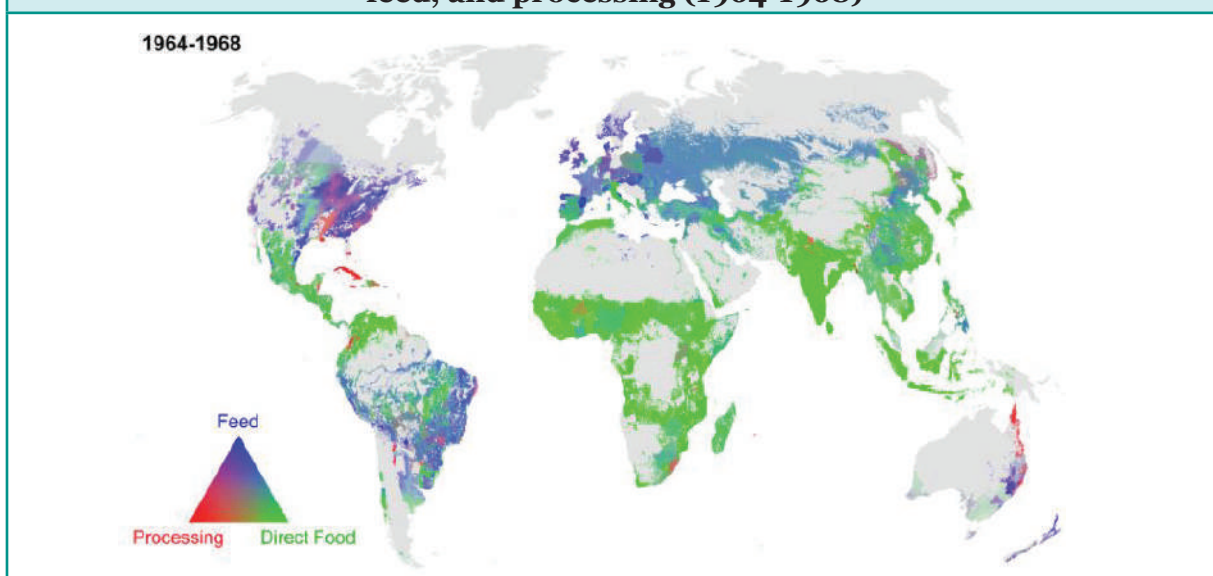
45 Ray, D. K., Sloat, L. L., Garcia, A. S., Davis, K. F., Ali, T., & Xie, W. (2022). Crop harvests for direct food use insufficient to meet the UN's food security goal. *Nature Food*, 3(5), 367-374.

46 Alexander et al. (2016). Human appropriation of land for food: the role of diet. *Global Environmental Change*.

livestock industry are maize (corn), soybean, legumes, bran and oilcake. These five crops are among the ten global crops that provide 83 per cent of all harvested food calories⁴⁷.

13.49. Furthermore, while croplands and crop yields have increased around the world, the proportion of crops being grown for food consumption has been declining since the 1960s (right around the time the feed industry began expanding in the West)⁴⁸. For example, the United States, with its abundance of cropland, was once thought of as the “food basket”, but today, with the rampant appropriation of arable land for feed crops, it is more likely to be termed the “feed basket.”⁴⁹.

Chart XIII.8: Average fraction of harvest used for Direct food, feed, and processing (1964-1968)



Source: Ray, D. K., Sloat, L. L., Garcia, A. S., Davis, K. F., Ali, T., & Xie, W. (2022). Crop harvests for direct food use insufficient to meet the UN’s food security goal. *Nature Food*, 3(5), 367-374.

13.50. Similar trends have begun emerging in other developing nations adopting the Western methods of animal husbandry, as rampant deforestation and shifting agricultural practices towards feed crop cultivation are presenting themselves as a major risk to food security in the developing world, especially with projected population growth trends. By 2030, many developing countries will not be able to fulfil the calories required for nourishment of the growing population due to the deficit in calories harvested as direct food crops⁵⁰. Many non-direct food crops not grown in wealthy countries are grown in developing countries for export to wealthy countries to supplement Western-style diets (such as feed for the meat industry)⁵¹. This is grim since land is already scarce, and arable land is even more so.

47 Tilman, D., Balzer, C., Hill, J., & Befort, B. L. (2011). Global food demand and the sustainable intensification of agriculture. *Proceedings of the national academy of sciences*, 108(50), 20260-20264.

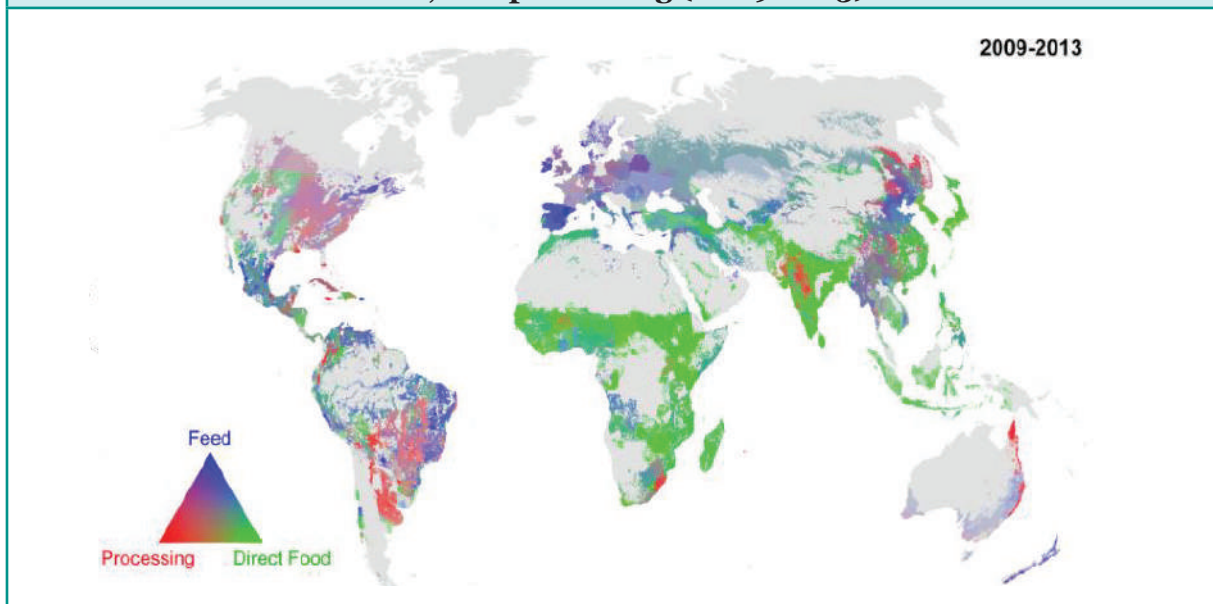
48 The World is Growing More Crops - but Not for Food, World Resources Institute, December 2022 (<https://www.wri.org/insights/crop-expansion-food-security-trends>)

49 Ray, D. K., Sloat, L. L., Garcia, A. S., Davis, K. F., Ali, T., & Xie, W. (2022). Crop harvests for direct food use insufficient to meet the UN’s food security goal. *Nature Food*, 3(5), 367-374.

50 The World is Growing More Crops - but Not for Food, World Resources Institute, December 2022 (<https://www.wri.org/insights/crop-expansion-food-security-trends>)

51 Ibid.

Chart XIII.9: Average fraction of harvest used for Direct food, feed, and processing (2009-2013)



Source: Ray, D. K., Sloat, L. L., Garcia, A. S., Davis, K. F., Ali, T., & Xie, W. (2022). Crop harvests for direct food use insufficient to meet the UN's food security goal. *Nature Food*, 3(5), 367-374.

13.51. This shortage of land is now leading to a land squeeze around the world, as just feeding the growing population would require an additional 600 million hectares (nearly twice the size of India) by 2050⁵². With more and more land being dedicated to growing animal feed rather than feeding each of the 828 million undernourished people affected by hunger⁵³, is now not the time to arrest this trend? We should ponder for a minute to ask ourselves if this is really the best use of our scarce natural resources.

13.52. In addition to resource scarcity and food security threats looming over the horizon, the established methods of livestock cultivation are also highly unsustainable for the environment. Growing feed has been facilitated through industry standard practices such as monocropping, restricted crop rotation, incessant freshwater withdrawals⁵⁴, excessive tillage, threatening local biodiversity⁵⁵, and the application of synthetic pesticides and herbicides⁵⁶. As one would expect, such practices are depleting farmland of its nutrients permanently, causing soil erosion and degrading the water quality⁵⁷.

13.53. These practices cannot continue in the developed world. With the demand for meat expected to increase by 2050 due to rising incomes in the developing world, they definitely

52 How to Manage the Global Land Squeeze?, World Resources Institute, July 2023

53 State of Food Security and Nutrition 2022, Food and Agriculture Organization of the United Nations

54 Accounting for 8 per cent of Global human water use as highlighted by UNFAO

55 Approximately 306 of the 825 terrestrial ecoregions identified by the Worldwide Fund for Nature (WWF) reported livestock as one of the major threats they face

56 Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, 360(6392), 987-992.

57 Livestock's Long Shadow: Environmental Issues and Options, Food and Agriculture Organization of the United Nations.

cannot adopt the same practices established by the Western feed industries. These concerns had already been elucidated 22 years ago by Gerbens-Leenes & Nonhebel (2002)⁵⁸. They stated, “*In Western countries, the influence of food consumption patterns on related land requirement is substantial, resulting in large regional as well as inter-generational differences...On a global scale, it should be realized that a large part of the population is undernourished...If patterns in developing countries shift towards the affluent menus of western countries, related per capita land requirements will rise substantially.*” India is already among the largest producers of meat in the world. Adopting the same practices followed elsewhere would result in disastrous consequences for the environment and the people at large.

13.54. Traditional farming practices from the developing world, where several agricultural activities are integrated with livestock rearing, offer one solution to the problem. Taking the example of India, our agricultural sector, primarily small and medium farm undertakings that engage in agriculture and livestock cultivation, has been practising sustainable farming for decades now (also called Integrated Farming System)⁵⁹. By recycling farm waste and by-products from other agricultural activities to serve as inputs for another activity (human inedible sources of feed such as grass and weeds plucked from fields, chaff and stubble collected post-harvest, and other agro-waste), farming enterprises within India have been able to lower costs of production and enhance the productivity of their undertakings without upsetting the natural cycle. Similarly, the Integrated Farming Systems tested in African countries demonstrated that livestock-based integration not only helped the daily agricultural processes but also helped mitigate food security and malnutrition risks in humans as well as livestock⁶⁰.

13.55. Shifting livestock to human-inedible feed can free up significant shares of global arable land to address global hunger. More food crops can be directed towards human consumption and alleviate food security risks worldwide. While such a strategy has obvious climate change mitigation benefits, one cannot ignore the adaptation benefits this strategy offers, too. Empowering farmers to reduce wastage and cultivate multiple income streams through an integrated farming system would help make a stressed sector within most developing countries a significant employment generator.

13.56. How meat is cultivated will heavily influence the risks associated with food security and our environment. While it is utopian to assume that the world would abandon meat consumption altogether and take up a completely vegan diet, in this hypothetical scenario, doing so would reduce the total land requirements for agriculture from 4.1 billion hectares to 1 billion hectares

58 Gerbens-Leenes, P. W., & Nonhebel, S. (2002). Consumption patterns and their effects on land required for food. *Ecological Economics*, 42(1-2), 185-199.

59 Shanmugam, P. M., Sangeetha, S. P., Prabu, P. C., Varshini, S. V., Renukadevi, A., Ravisankar, N., ... & Gopi, M. (2024). Crop–livestock-integrated farming system: A strategy to achieve synergy between agricultural production, nutritional security, and environmental sustainability. *Frontiers in Sustainable Food Systems*, 8, 1338299.

60 Erick, O. O., Mlingi, F. T., Nyonje, B. M., Charo-Karisa, H., and Munguti, J. M. (2013). Can integrated livestock-fish culture be a solution to East Africa's food insecurity? A review. *African J. Food, Agric. Nutr. Dev.* 13, 8058–8076. doi: 10.18697/ajfand.59.12920

(an area the size of North America, plus Brazil)⁶¹. The purpose of this hypothetical is not to agonise over whether to eat meat or not but to demonstrate that many more efficient ways are available to feed the planet.

13.57. Feeding an expected 10 billion people by 2050 is not trivial. Changes need to be brought about to the meat production processes without any delay, and the developing world should not only avoid emulating the environmentally and climatically unsustainable practices of the West but also point the way to the West, with its own food-feed balance practised for aeons.

13.58. To reiterate, a better food-feed balance will only need a fraction of the land that is currently used for food production. The entire world can still be well-fed and leave more land for other purposes, such as renewable power generation. Instead, what we face is the danger or prospect that Western practices of cattle-rearing will spread to the rest of the world, just as the Western obsession with Artificial Intelligence and feeding it with copious quantities of data for it to become truly intelligent is consuming vast amounts of energy and water and upending energy generation plans in many countries. Developing countries are falling line, lest they fall behind in a chimeric race for technological competitiveness, unmindful of social and environmental consequences. The parallel cannot be any more uncanny than this.

Housing

13.59. As countries move towards economic development, one of the changes they experience is in the social fabric of society which in today's world, is a Western model of living, i.e., nucleated families and single-person residences. It is estimated⁶² today that nearly 50 per cent of all households⁶³ in India are nuclear (1-4 members), up from 38 per cent in 2008. On average, a typical nuclear family in India had an average of 3 members vis-a-vis 7 in a joint family setup – nucleation rising in South India as opposed to North India. This is a major shift from our older societal norms of multi-generational living with Hindu undivided families (HUF) living under the same roof. Chapter 8 of this survey on India's labour markets notes that a report by the United Nations Population Fund and the International Institute for Population Sciences emphasises the importance of elderly people living in multi-generational households. Indians did not really have to learn this from a United Nations report. It was part of our tradition. Naturally nucleated living gives rise to demand for additional housing units, smaller and more independent in nature. Given that the demand is only expected to double by 2050⁶⁴ and the sheer complexity involved due to urban areas in size ranging from over 15 million to a few thousand people as well as local vs new settlements, and different housing-building practices, India has a looming housing issue on the horizon.

61 Hannah Ritchie (2021) - "If the world adopted a plant-based diet, we would reduce global agricultural land use from 4 to 1 billion hectares" Published online at OurWorldInData.org. Retrieved from: (<https://ourworldindata.org/land-use-diets>).

62 As per data from Kantar Worldwide in 2022.

63 12.98 crore nuclear out of 24.88 crore households as per Census 2011.

64 World Bank article (<https://www.worldbank.org/en/topic/urbandevelopment/overview>)

13.60. Land, on the other hand, remains constricted, but aspirations are not so. Many high-income urban nucleated settlements give rise to the tendency of urban sprawl⁶⁵, which is linked to higher energy consumption, elevated pollution levels, and increased traffic congestion causing significant negative environmental externalities⁶⁶. The correlation between household size and adverse impact on sustainability is being recognised all over the world. A 2021 research paper⁶⁷ says that the decrease in average household size in China over the past few decades is leading to a loss of scale economies. The paper further states, “*CO₂ emission, water withdrawal, smoke ash emission, SO₂ emission, NO_x emission, and industrial wastewater discharge were found to increase with a smaller household size. For example, a household size reduction of 0.5 (to 2.5 members) by 2030–2035 could result in a 0.5% increase in CO₂ emission and a 0.3% increase in water withdrawal as compared with the levels in 2015. The increase in CO₂ emission is almost equal to the entire emissions of Portugal.*”

13.61. Despite this, our living dwellings today mimic a universalised model of living – dominated by concrete, closed spaces, less ventilation, and a higher need for air conditioning, as opposed to multi-generational family homes in older times. Traditional Indian living spaces were built far more sustainably – a central courtyard that allowed for ventilation, natural lighting and cooling, and more co-habitation, usage of local building materials that prevented the need for transporting the high amount of concrete over long distances, building practices that did not require highly mechanised environments and had local labour filling in the gap. Unfortunately, much of this is not documented as ‘sustainable practice’.

13.62. The world knows sustainable housing as one that is characterised by solar and wind-powered energy, specially manufactured low-energy windows, and the use of LEDs. Unfortunately, keeping only these norms as a measure of sustainability is a false positive due to two reasons – 1) it requires reengineering of the entire building and construction ecosystem which is difficult in a resource-constrained environment 2) the impact of small measures is over-calculated in place of the lifecycle cost of higher-density, non-nucleated living with traditional building homes.

13.63. With more and more changes in Indian lifestyles of living, the environmental impact of these activities of a large population is only going to exacerbate the climate change issue.

65 Rapid geographic expansion of urban areas, characterized by low-density residential developments, single-use zoning, and increased dependence on automobiles.

66 Expanding urban footprint leads to habitat destruction and the fragmentation of natural areas, imposing external costs on ecosystems.

67 Wu, W., Kanamori, Y., Zhang, R., Zhou, Q., Takahashi, K., & Masui, T. (2021). Implications of declining household economies of scale on electricity consumption and sustainability in China. *Ecological Economics*, 184, 106981

THE INDIAN WAY: A SUSTAINABLE LIFESTYLE

“*mātā bhūmih putruahan prthivyā*:⁶⁸” (Prithvi Sukta, Shlok 12)

13.64. Time and again, when a major adversity shakes the world out of its stupor, the relative resilience of Indians is a subject of great surprise⁶⁹. The natural resilience emanates from this land’s deep, spiritual, and philosophical understanding of the concept of cycles of creation and destruction.

13.65. Nowhere, it is greatly reflected than in our relationship with ‘Nature’ that not only has tremendous power, but also a mind and temper of its own. We need to be in sync with its order because nature is not going to change its laws for the assumed strategies of man. Hence, global environmental and sustainability strategy must be in accordance with the cyclic temperament of Nature rather than in the misplaced belief that our industrial siloed actions can alter even a sliver of its fabric. It is here where India can help.

13.66. Even as the traditional scientific approaches to climate change are welcome, it’s high time that India adopted and disseminated its wisdom of pursuing a life of sustainability. While India agrees with the need for top-down policy-level changes, we also believe in the collective power of small individual actions. That each person contributes to both emission generation as well as emission reduction is a simple fact that we must take into account while designing policies, and awareness programmes, or even while tabulating statistics related to the environment.

13.67. In Sukla Yajurveda (36-17), the sages recited the verse:

“पृथिवी शान्तिरापः शान्तिरोषधयः शान्तिः ।
वनस्पतयः शान्तिर्विश्वेदेवाः शान्तिर्ब्रह्म शान्तिः
सर्वं शान्तिः शान्तिरेव शान्तिः सा मा शान्तिरेधि ॥
ॐ शान्तिः शान्तिः शान्तिः

Peace and Balance in Earth, Water, Plants, Trees, and Gods. May there be balance in you, in space, and in everything.

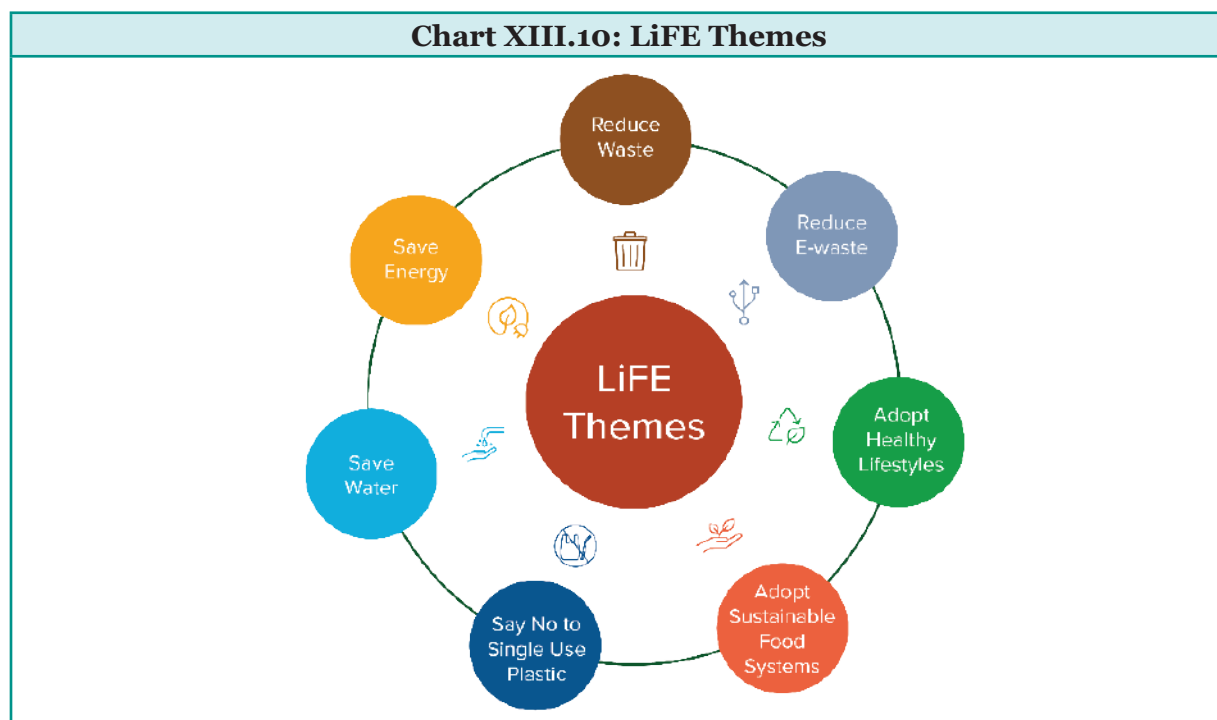
MISSION LIFE (LIFESTYLE FOR ENVIRONMENT)

13.68. This thought process was at the base of Mission LiFE⁷⁰, announced by Prime Minister Modi, at the 2021 UN Climate Change Conference (UNFCCC COP2026) which seeks to bring individual responsibility to the forefront of the global climate narrative. It derives its philosophy from ancient Indian philosophy that espouses a naturally sustainable lifestyle in accordance with nature, steering individual actions and collective demand towards pro-planet choices. It encompasses a comprehensive but non-exhaustive list of 75 LiFE Actions for adoption by individuals to live more sustainably.

68 (Rigveda,1/90/6,7,8) invokes divine intervention to bliss and protect the environment. “*madhu vātāh ritāyate madhu ksaranti sindhavah mādviḥ nah santusadhi. madhu naktamutusāsu madhumatpārthiva rajah madhu ksorastu suryah mādhirgābo bhavantu nah*”

69 The Subprime Crisis (<https://tinyurl.com/5hdy2s82>), The Covid-19 Pandemic (<https://tinyurl.com/yzx5nw72>)

70 Mission focuses on 7 themes - Saving Energy and Water, Reducing Single Use Plastic and E-waste, Adopting Sustainable Food Systems, Reducing Waste and adopting Healthy Lifestyles



13.69. Taking this philosophy forward, LiFE should have a doctrine for the world, resting on 5 fundamental principles.

Individual action is the core of Climate Responsibility

13.70. As described in the previous sections, no economic or industrial strategy is going to be successful without the world's population changing its approach to climate and environment. Hence, before compelling poorer nations to change their developmental journey, it's necessary for individuals, especially in the developed world, to alter their lifestyle in favour of simple behavioural changes, all of which directly contribute to mitigation efforts.

13.71. India has great experience in individual-led sustainable behaviours - using a cloth for kitchen cleaning instead of tissue papers, leaves instead of disposable plates and packaging material, water-based toilet cleaning systems, reuse and upcycling of household items, and even ancient home remedies of pest control focussed on route deviation rather than killing. Practising a lifestyle where we indulge in less of 'fast fashion', getting things repaired than thrown at the first sight of discomfort, turning off lights when not using the room/area, etc, and digital consciousness in the form of accepting bills as e-bills rather than paper bills, conserving electricity through the purchase of energy-efficient products, switching off when not in use, adopting cleantech products, virtual meetings but physical activities like outdoor run, use of solar water heaters. This is not even taught, and it's imbibed, learned, and passed on to successive generations. Unfortunately, this is changing in favour of capitalistic practices derived from market societies, since they are, unfortunately, seen as symbols of upward migration.

13.72. At the core of it, it does seem duplicitous to talk about sustainability to poorer countries without changing anything about global lifestyle driven by overconsumption, beef-eating, and

fast fashion. Individuals must be encouraged to give up voluntarily these energy sins and bring their actions in line with their stated purpose. A change in demand will automatically cause a change in supply by relevant industries.

13.73. Voluntary relinquishment is not new in India. With a historical ashram-based⁷¹ culture where householders give up their material desires voluntarily to advance towards devotion to society and God, the principles have been used for greater community welfare even in present times. The ‘Give It Up’ LPG Subsidy Scheme is perhaps the best example of this theory in practice at scale. #GiveItUp’ campaign launched in 2015, aimed at motivating 5.7 million Liquefied Petroleum Gas (LPG) users who could afford to pay the market price for LPG to voluntarily surrender their LPG subsidy to help pay for LPG cylinders to those rural women who depended on firewood for cooking food. Cooking on open fires and on inefficient wood-burning stoves emits close to 25% of global black carbon emissions. This brilliant individual renunciation for a higher cause not only reduced ill-health incidences in women but also directly impacted climate change.

13.74. Voluntary planting of trees and keeping surroundings clean and minimalistic contribute directly to environmental impact. Usage of locally sourced nature-based artisan choices like pattals, and bamboo bottles, refraining from excessive plastic use, and, making conscious choices in favour of sustainability will go a long way in curbing large-scale demand for environmentally adverse things.

13.75. One area where individual action is most desired and most needed is water reuse, less wastage, and water conservation. Water is not only the elixir of life but a non-negotiable as far as existence is concerned. The greatest news about Mars was the possibility of water on that planet⁷², such is its importance. So, even as governments step in to increase water supply, bring in efficiency, and redirect non-potable water to other uses, Individuals must drastically reduce their wastage of this extremely precious resource. Small actions such as collecting kitchen water to water plants, not leaving taps endlessly open, and using rainwater harvesting to utilise rainwater are both doable and desirous in the context of climate change.

Collective policy reflective of Individual pro-planet choices

13.76. Consistency. Compounding. Two words when practised can make and break empires. Small but consistent actions have a large compounding effect observable across time. The Japanese even have a term for it – ‘Kaizen’. As described above, individual choices on a daily basis can help in sustainability, but even greater is a collective policy of pro-planet small everyday choices, but nudged and mandated by the government. These are reflected in several actions as follows:

71 Four ashrams or stages (25 year each) in life of an individual – Balavastha (Childhood and Learning), Grihastha (Householder’s life of pursuing material desires), Vanaprastha (giving back to society), Sanyas (Renunciation and Oneness with God)

72 Retrieved from NASA (<https://www.nasa.gov/news-release/nasa-confirms-evidence-that-liquid-water-flows-on-todays-mars/>).

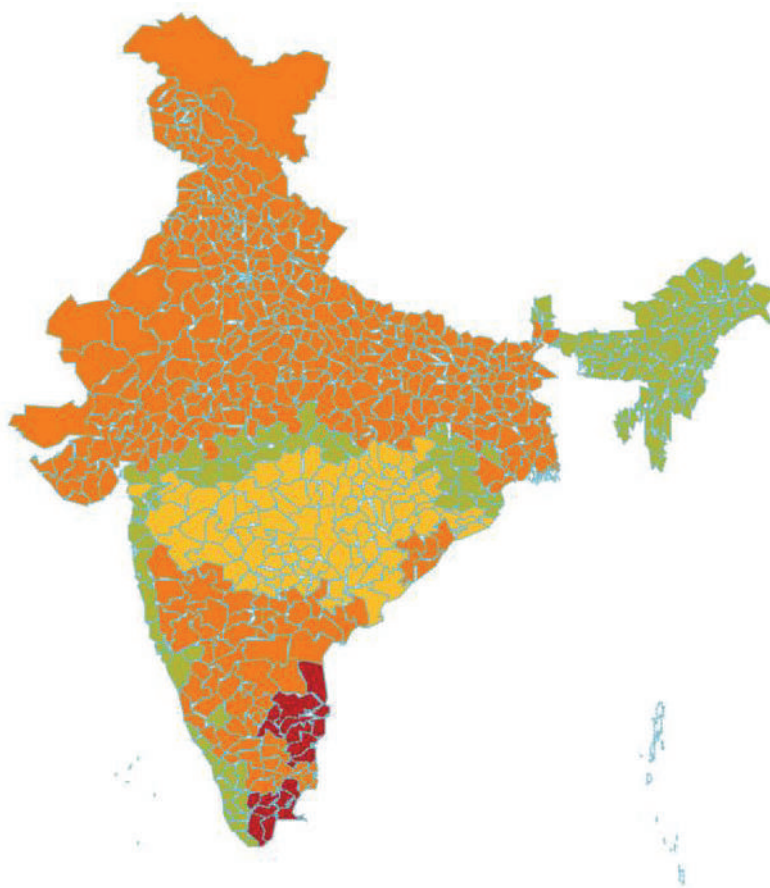
- (a) Using air-conditioning and thermostats at more optimum and sustainable temperatures⁷³:** As pointed out by the Prime Minister of India, there is little sense in keeping temperatures artificially low to 17-18 degrees and then using a blanket. Default settings on ACs and temperatures in public places like malls, offices, and airports can be increased from 18 to 24-25 degrees. Popularly called the ‘Air conditioning paradox’⁷⁴, as this article⁷⁵ beautifully describes, it is a Catch-22 situation “*One of the great ironies of climate change is that as the planet warms, the technology that people need to stay cool will only make the climate hotter.*” With a large population cramped in small places, India cannot afford to go down the individual air-conditioning route, where every small room has an AC and makes the neighbouring air so worse off that they require another, thus setting off a vicious circle. Not earlier than 15 years ago also, most households in India did not have access to ACs and instead relied on a combination of approaches – khus cooling with intermittent use of water coolers and earthen pots for water. The capitalist approach to solving any problem requires manufacturing at scale, thereby ushering in modern air-conditioners, which seem to have made the problem worse. India must vote to bring in a mix of modern air-conditioners and our traditional mechanisms – ventilated construction, large windows, use of local materials, water-based cooling systems, and usage of fans wherever possible.
- (b) Reducing the need to carry disposable plastic bags repeatedly on errands,** both by decreasing consumption and replacing them with reusable fabric bags. More than 1 million bags are used every minute with an average working life of 15 minutes, but stay on the earth’s surface forever, unless recycled.
- (c) Building a culture of water reuse through individual behaviour change** and mandated design specifications in favour of structures like rainwater harvesting. Water is becoming scarcer and scarcer resources. Some regions of the world have almost no access to fresh water. Governments should mandate water-efficient technologies and re-examine water-wasting ones (e.g., Reverse Osmosis water machines, single flush toilets).
- (d) Practicing sustainable agriculture through the use of local seeds and natural farming practices.** Agriculture residue to be used for mulching and composting.
- (e) Fiscal Incentives for large households rather than single or two-person households,** indirectly nudge societies to favour sustainable choices.

13.77. Increased demand will re-energise the market for sustainable, traditional products that were made by local skilled workers and did not require industries from across the world to produce. Moreover, products of ivory, leather, and those made of endangered species must be individually discouraged and policy-banned. Circularity and reuse of waste products must be incentivised by the government. A good example will be the Government’s mandate for ethanol blending in petrol, achieving the target of 10% in 2022.

⁷³ Use of AC continuously can increase city temperatures by up to 2 degrees Celsius.

⁷⁴ The air conditioning paradox, Vox, May 2022 (<https://www.vox.com/science-and-health/23067049/heat-wave-air-conditioning-cooling-india-climate-change>).

⁷⁵ How to prevent air conditioners from heating the planet, Scientific American, June 2021 (<https://www.scientificamerican.com/article/how-to-prevent-air-conditioners-from-heating-the-planet/>).

Chart XIII.11: Per-capita Water Availability 2025

Source: India Climate & Energy Dashboard, NITI Aayog

13.78. Another area where individual choices and government action must converge is Fashion and Textiles. As per UNEP, the fashion industry is the second-biggest consumer of water and is responsible for 2-8% of global carbon emissions, 24% of insecticides, and 11% of pesticides. Apart from voluntary reuse and upcycling of clothes, there is a strong need for a Policy on Circularity in Textiles in India, as currently, less than 50% of textile waste in India undergoes any kind of reuse, repair, or remanufacture.

Incorporation of local and sustainable geography and culture

13.79. ‘Annam Brahman’ or Food is God. Ancient India wrote this in black and white and left it for successive generations to ponder upon. However, in the flurry of everything that is ‘not us’ being better, local food gave way to packaged fast-food and food choices different from the geography of our existence. Even today, Indian cuisine is primarily plant-based. This doesn’t mean that everyone is a vegetarian; it means that the bulk of our food base remains vegetarian – rice, dal, roti, and meat are an added separate delicacy. It is the same in our packaged food such as chips which are almost 99.99% plant-based, given the diverse food people eat across a country this large. Most of the cuisines are heavily dependent on local geography which not only provides a medicinal value to food but also reduces ecological footprint and reduces energy requirements. This is opposed to the global practice of industry-supplied veganism where in

order to eat more sustainable food, one has to be dependent on avocados flying from halfway across the world or soy milk which has previously caused Amazon rainforest degradation⁷⁶.

13.80. Good health is a great economic contributor also because all episodes of ill health cause double economic losses – reduction of productive time and costs spent on recovery. While modern medicine has done a great job of germ-based infection recovery and biological engineering, India has practised Ayurveda for years, which emphasises existence in accordance with nature, prevention rather than cure, and natural remedies rather than clinical supplements with an unclear understanding of their long-term damage. ‘Popping the pill’ culture must give way to a greater curiosity around the ‘why’ of ill health (which is not due to any accident / congenital issue/toxicity) and the role that our local food and medicinal systems will play in bringing down their incidences.

13.81. It’s time that the world adopted this Golden Principle of sustainable ingestion – eat local, eat fresh, eat sustainably:

- More plant-based diet.
- Use of leaf-based disposable plates instead of Styrofoam and single-use plastic.
- Use of fermented products (as is dominant in Asian cultures) that use natural sun storage for achieving the desired state.
- Upcycling food waste, or organic composting food waste (sour milk to paneer and reuse of whey water for lentils).
- Growing medicinal herbs such as Tulsi, and neem around us.
- Afforestation of water-table saving trees.
- Eating seasonally and locally – e.g. more millets than quinoa.
- Production of natural varieties and seed harvesting are to be publicly incentivised.

Public Policy and not the Market at the helm of undertaking the ‘right’ decision

13.82. This approach focuses on influencing individual behaviours through policy approaches. How individuals behave and choose to consume is shaped by the surrounding norms, policies, incentives, and infrastructure, and herein there is a role for governments, community leaders, and media.

13.83. The Ujala program, launched in 2015, to encourage energy-efficient LED lights has resulted in energy savings of around 48 billion kWh per year and estimated savings of USD 2.5bn per year. People were incentivised to adopt these LED lights by bringing down buying costs for people. This was possible through govt. plans for bulk procurement and supply. By harnessing individual and collective awareness efforts, including even of children, the program brought about widespread change. Thus, a people-behaviour lifestyle change approach directly helped in climate mitigation.

⁷⁶ Retrieved from Greenpeace (<https://www.greenpeace.org/usa/victories/amazon-rainforest-deforestation-soy-moratorium-success/>)

13.84. According to the International Energy Agency's modelling, the adoption of the kinds of actions and measures targeted by the LiFE initiative worldwide would reduce annual global CO₂ emissions by more than 2 billion tonnes (Gt) in 2030 (20% of the emissions reductions needed by 2030) and in consumer savings of about USD 440 billion. That is non-trivial.

*"... transformation on the supply side will not be enough; demand-side transformations will also be essential to stay within planetary boundaries. Energy requirements for providing decent living standards to the global population can be drastically reduced, but in addition to the use of the most efficient available technologies, this implies a radical transformation of consumption patterns, including political procedures to prioritise between competing consumption claims."*⁷⁷

13.85. The importance of public investment in undertaking transformational projects cannot be emphasised enough. Our world's history is replete with such examples - post-WW II reconstruction, exploration of space, the development of the internet (during its prototype stages), and the Highways construction project in the USA in the Sixties – were handled and executed by the public sector, based on government funding or funding by public authorities – domestic, international or multilateral. Similarly, today, there is a need for public investment in carbon sequestration, carbon sinks, battery storage technologies, and green hydrogen will obviate problems with intellectual property rights and help assert the global public nature of solutions.

13.86. However, this must be accommodated by awareness campaigns towards Mission LiFE in all relevant areas, starting early from school onwards, as was done for behaviour change towards Open Defecation Free (ODF) campaign in Swachh Bharat.

Mindful consumption of resources, based on need and not greed

13.87. It is unfortunate that the predominant measure of a country's worth comes from an ever-increasing GDP, which is driven primarily by consumption in a capitalist world. Derek Brower, Amanda Chu, and Myles McCormick say in FT⁷⁸, that *"Capitalism won't deliver the energy transition fast enough. For all the cleantech advances and renewable deployment in recent decades, fossil fuels' share of total global energy use was 86% in 2000 and 82% in 2023."*

13.88. Countries must therefore look at encouraging sustainable lifestyles – emphasis on low wastages on adjusting life in a way that 'wants' don't become 'needs'. That's living well but harmoniously. Excesses of materialism only have negative externalities - more wastage, more littering, more eternal garbage sitting on the earth's surface, less happiness – the law of diminishing marginal utility of the happiness-ownership curve can be seen in everyday lives. Most of the generation that is between ages 30 and 70 has seen a life where disposability and

⁷⁷ Energy Dilemma, Cedric Durand, November 2021 (<https://tinyurl.com/2kekb8dm>)

⁷⁸ The Energy Transition will be volatile, Financial Times, accessed on 25th June 2024 (<https://tinyurl.com/52syuz7j>).

dispensability were not a part of existence. Materiality was linked to long periods of sacrifice and the rare acquisition that fuelled feelings of happiness.

13.89. It's a philosophical shift from the way we understand life. A large body of research⁷⁹ has brought forward the theory of the 'Paradox of Choice' that runs counterintuitive to the ideas of Capitalism. Even though choice is good for us, its relationship to contentment is quite complicated, and choice overload⁸⁰ leads to a large set of negative outcomes. These range from indecisiveness to confusion to complications to dissatisfaction. In the Picture of Dorian Gray, Oscar Wilde says "*Nowadays, people know the price of everything and the value of nothing.*"

13.90. The final principle of LiFE implores us to enjoy the intrinsic value of things and experiences, without overburdening ourselves with overconsumption. It is not about living ascetically but living mindfully. When leaving half a bottle of water, and picking up another, it's time to remember that this plastic will not only outlive us, but also our children and our grandchildren, and that is probably not the future we wish to bequeath them.

CONCLUSION

13.91. The most important human factor in enlivening these principles to life is also one of the most elusive in modern life – Thahraav (तह्राव) or Settlement/Contentment that comes with Equanimity. It is not stoppage, it is not stagnation, and it is not even a compromise. It is a human's ability to have the confidence and the power to opt for internal stability to prepare for and accept outside change. It is only when humans can channel this energy that they can stop asking for more. It is the absence of such contentment that has made erstwhile communal things in the home become individual – e.g., television. Things unavailable didn't cause grown men to cry and children to shrink from playing with others. This stands in contrast with the consumption-oriented living of today, where every individual is a consumer (especially children⁸¹), instead of a family. That's why households, today, need more devices per person as compared to a single television earlier. Within that one statement lies the entire linkage between social mores, overconsumption, disposability, and growing mountains of trash. As per IFC, '*world generates over 2 billion tons of municipal solid waste annually⁸², and is expected to increase 70% by 2050.*'

13.92. The hunger to consume more and more means we keep missing the bus in the global discourse on sustainability, by constantly suggesting rewiring the pathways to renewables rather than attacking the root of the problem. Treating the symptoms to cure a growing disease.

79 More Isn't Always Better, Barry Schwartz, Harvard Business Review, June 2006 (<https://hbr.org/2006/06/more-isnt-always-better>)

80 Reutskaja, E., Iyengar, S., Fasolo, B., & Misuraca, R. (2020). Cognitive and affective consequences of information and choice overload. In Routledge handbook of bounded rationality (pp. 625-636). Routledge.

81 Committee on Communications; Children, Adolescents, and Advertising. Pediatrics December 2006; 118 (6): 2563–2569. 10.1542/peds.2006-2698.

82 The World has a waste problem, International Financial Corporation, April 2024 (<https://www.ifc.org/en/blogs/2024/the-world-has-a-waste-problem>)

13.93. It's time to rebuild societies with equanimity.

13.94. Internal equanimity contributes to more acceptance of others and, therefore to better human relations, which we now know, is also more conducive to larger, cohesive families, and consequently better social and sustainable impact. Access to more material choices and economic betterment shouldn't throw us so off-balance that we forget we come from Nature and must return to it. Our conscious and unconscious choices should not be divorced from the drivers of life on earth. Hence, the global movement on climate change must be accommodative of sovereign choices and economic needs, but centred on individual behaviour - 'LiFE'.



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