MARCH - APRIL 2025

INDUSTRY Insights

MEMBERS IN INDUSTRY & PSUs COMMITTEE

Engineering India's Growth: Financial Strategies Behind Infrastructure and Innovation

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA

(Statutory Body under an Act of Parliament)

www.icmai.in

Behind every successful business decision, there is always a CMA

Vision Statement

"The Institute of Cost Accountants of India would be the preferred source of resources and professionals for the financial leadership of enterprises globally."

Mission Statement

"The CMA Professionals would ethically drive enterprises globally by creating value to stakeholders in the socio-economic

Mission Statement

असतोमा सद्गमय तमसोमा ज्योतिर् गमय मृत्योर्मामृतं गमय ॐ शान्ति शान्ति शान्तिः	From ignorance, lead me to truth From darkness, lead me to light From death, lead me to immortality Peace, Peace, Peace

About the Institute

The Institute of Cost Accountants of India (ICMAI) is a statutory body set up under an Act of Parliament in the year 1959. The Institute as a part of its obligation, regulates the profession of Cost and Management Accountancy, enrols students for its courses, provides coaching facilities to the students, organizes professional development programmes for the members and undertakes research programmes in the field of Cost and Management Accountancy The Institute pursues the vision of cost competitiveness, cost management, efficient use of resources and structured approach to cost accounting as the key drivers of the profession. In today's world, the profession of conventional accounting and auditing has taken a back seat and cost and management accountants increasingly contributing towards the management of scarce resources like funds, land and apply strategic decisions. This has opened up further scope and tremendous opportunities for cost accountants in India and abroad.

The Institute is headquartered in Kolkata having four Regional Councils at Kolkata, Delhi, Mumbai and Chennai, 117 Chapters in India and 11 Overseas Centres. The Institute is the largest Cost & Management Accounting body in the world with about 1,00,000 qualified CMAs and over 5,00,000 students pursuing the CMA Course. The Institute is a founder member of International Federation of Accountants (IFAC), Confederation of Asian and Pacific Accountants (CAPA) and South Asian Federation of Accountants (SAFA). The Institute is also an Associate Member of ASEAN Federation of Accountants (AFA) and member in the Council of International Integrated Reporting Council (IIRC), UK.

Behind every successful business decision, there is always a CMA

MARCH - APRIL 2025

INDUSTRY Insights

MEMBERS IN INDUSTRY & PSUs COMMITTEE

Engineering India's Growth: Financial Strategies Behind Infrastructure and Innovation

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA

(Statutory Body under an Act of Parliament)

www.icmai.in

Behind every successful business decision, there is always a CMA

THE COUNCIL (2024 - 2025) OF
THE INSTITUTE OF COST ACCOUNTANTS OF INDIA

Statutory Body under an Act of Parliament

www.icmai.in

CMA Bibhuti Bhusan Nayak
President

CMA TCA Srinivasa Prasad
Vice President

CMA Ashwin G. Dalwadi
Immediate Past President

CMA (Dr.) Ashish Prakash Thatte

CMA Avijit Goswami

CMA Chittaranjan Chattopadhyay

CMA Harshad Shamkant Deshpande

CMA (Dr.) K Ch A V S N Murthy

CMA Manoj Kumar Anand

CMA Navneet Kumar Jain

CMA Neeraj Dhananjay Joshi

CMA Rajendra Singh Bhati

CMA Suresh Rachappa Gunjalli

CMA (Dr.) V. Murali

CMA Vinayaranjan P

CMA Avijit Goswami
Chairman
Members in Industry & PSUs Committee
The Institute of Cost Accountants of India

MESSAGE

We are pleased to extend a warm welcome to all of you as we convene to deliberate on the insightful and forward-looking theme: "Engineering India's Growth: Financial Strategies Behind Infrastructure and Innovation."

Infrastructure is the backbone of any thriving economy, and in India's growth story, it plays a defining role. As we move toward becoming a $5 trillion economy, the need for smart, inclusive, and sustainable infrastructure has never been more urgent. Equally important are the financial strategies that enable these projects—blending innovation, investment, and impactful policy.

This platform provides a unique opportunity to engage with visionary minds, share best practices, and explore financial models that support large-scale development while ensuring economic resilience.

We are confident that the ideas and insights exchanged here will inspire meaningful collaboration and contribute to the continued transformation of India's infrastructure landscape.

Thank you for your continued support.

Warm regards,

CMA Avijit Goswami

Inside...

CONTENTS

Engineering India's Growth:
Financial Strategies Behind Infrastructure and Innovation.....1 to 3

Highways to Growth:
India's Expanding Road Infrastructure .....4 to 9

India's Expanding Rail Infrastructure:
Driving Connectivity and Growth .....10 to 14

Telecommunication Infrastructure Development in India
and Its Role in Economic Growth .....15 to 18

Water and Sanitation Infrastructure Development in
Indian Economic Growth.....19 to 20

India's Port and Energy Infrastructure:
Driving Economic Growth and Global Competitiveness .....21 to 23

Healthcare Infrastructure Development in India: Progress and Challenges .....24 to 28

Innovation as the Engine of India's Growth..... 29 to 31

Innovation Related Government Initiatives in India ..... 32 to 35

India's Growth and Innovation ..... 36 to 39

Market Report:
A Recap of the Key Developments for the month of March and April 2025 .....40 to 45

Engineering India's Growth: Financial Strategies Behind Infrastructure and Innovation

Introduction

India stands at a pivotal juncture in its economic trajectory, aiming to solidify its position as a global growth engine. This ambition is intrinsically linked to two critical pillars: robust infrastructure development and a thriving innovation ecosystem. Historically, India has recognized the importance of these sectors for sustained economic progress, but the sheer scale of the country's population, its diverse geographical landscape, and the rapid pace of global technological advancements necessitate strategic and substantial financial commitments.

Infrastructure, encompassing transportation networks (roads, railways, ports, aviation), energy, urban development, and digital connectivity, forms the bedrock for economic activity, facilitating trade, investment, and improved quality of life. Significant strides have been made, with government initiatives like the National Infrastructure Pipeline (NIP), PM Gati Shakti, and Bharatmala Pariyojana driving massive public capital expenditure. However, the financing needs for such large-scale, long-gestation projects are immense, requiring a multifaceted approach involving public, private, and international funding. Challenges like project development costs, asset-liability mismatches, and attracting long-term patient capital have spurred the creation of specialized institutions like the National Bank for Financing Infrastructure and Development (NaBFID) and schemes like the India Infrastructure Project Development Funding Scheme (IIPDF) to bridge these gaps and encourage Public-Private Partnerships (PPPs).

Concurrently, innovation is recognized as the key to driving productivity, fostering new industries, and ensuring India's competitiveness in the global economy. The country has witnessed a burgeoning startup ecosystem, a significant increase in technology adoption (especially in digital payments), and a growing focus on research and development (R&D). Government programs like Startup India, Digital India, and the recently announced Anusandhan National Research Fund aim to provide a supportive environment, financial assistance (e.g., Seed Fund Scheme, Fund of Funds), and regulatory ease for innovative ventures. Despite this progress, India faces challenges in terms of relatively lower R&D pending compared to developed economies, limited access to risk capital for deep-tech startups, and the need to strengthen academia-industry collaboration to translate research into commercial applications.

India's journey towards becoming a $5 trillion economy is rooted in two critical growth enablers: robust infrastructure development and a thriving innovation ecosystem. The seamless integration of these domains, backed by strategic financial interventions, is shaping India's developmental trajectory. The Indian government has significantly scaled up capital expenditure to accelerate infrastructure growth. In the Interim Budget 2024-25, capital outlay for infrastructure was set at INR 11.11 lakh crore (USD 134 billion), marking an 11.1% increase over the previous year, representing

approximately 3.4% of the nation's GDP (KPMG, 2024). Sectors such as roads and railways received substantial allocations of INR 2.76 lakh crore (USD 33.4 billion) and INR 2.55 lakh crore (USD 31 billion) respectively (IBEF, 2024), while renewable energy projects, especially solar grids, saw allocations rise from INR 4,970 crore to INR 8,500 crore. The National Infrastructure Pipeline (NIP) outlines over 9,100 projects worth USD 1.9 trillion, with more than 2,470 projects under active implementation (IBEF, 2024). To further boost capital, the National Monetisation Pipeline (NMP) aims to mobilise INR 6 lakh crore (USD 72 billion) through brownfield asset monetisation (NITI Aayog, 2024).

Private capital mobilisation is gaining momentum, with private infrastructure investment standing at INR 1.51 trillion in FY 2023-24, and renewable energy attracting USD 3.76 billion in FDI, marking a 50% year-on-year rise (Indian Infrastructure, 2024). Conglomerates like the Adani Group have committed USD 15-20 billion annually towards airports and energy, while Brookfield Asset Management plans to grow its Indian infrastructure portfolio to USD 100 billion over five years, including renewable and nuclear energy (Financial Times, 2024). In parallel, the Reserve Bank of India (RBI) has relaxed provisioning norms for infrastructure loans, easing credit access for developers (Reuters, 2025). Financing tools such as Infrastructure Investment Trusts (InvITs) and Real Estate Investment Trusts (REITs) are becoming significant for attracting domestic and global investors.

On the innovation front, India's Gross Expenditure on R&D (GERD) has reached INR 1.27 lakh crore, although it remains at 0.64% of GDP, trailing countries like the US (3.5%), China (2.4%), and South Korea (4.8%) (Drishti IAS, 2024). The Anusandhan National Research Foundation (ANRF) established in 2023 consolidates research funding and fosters private sector participation. Patent filings have doubled since 2015, with domestic applicants now accounting for over half of all filings (Economic Times, 2024). India ranks 39th in the Global Innovation Index 2024, leading among lower-middle-income economies (Managing IP, 2024). The Start-up India initiative has registered over 159,000 start-ups generating 1.7 million jobs, with 49% of ventures emerging from Tier 2 and Tier 3 cities (Startup India, 2025). India boasts 112 unicorns, placing it among the top three global start-up ecosystems. Meanwhile, the fintech sector has experienced exponential growth, with the Unified Payments Interface (UPI) processing INR 18.41 trillion worth of transactions in January 2024 alone, and India emerging as the third-largest fintech market globally (UPI, 2024).

India's digital infrastructure is expanding rapidly, with data centre capacity reaching 977 MW and over 1 GW under construction. The market is projected to grow from USD 4.5 billion in 2023 to USD 11.6 billion by 2032, driven by demand for cloud services and AI (NASSCOM, 2024). Companies like Airtel's Nxtra, Reliance, and Adani are investing in green and AI-ready data centres to support the digital economy. However, challenges persist, with private sector capital expenditure expected to decline by 25% in FY 2025 (Economic Times, 2025), alongside project delays, cost overruns, limited bond market participation, and power supply constraints for data centres. To overcome these hurdles, policy clarity, risk mitigation, increased research spending to 1% of GDP, expansion of InvITs, REITs, and green bond markets, and enhanced digital public infrastructure are recommended. By sustaining reforms, mobilising private capital, and boosting research investments, India can realise its growth aspirations while fostering a resilient and future-ready economy.

India is strategically bolstering its economic growth by prioritizing both robust infrastructure development and a dynamic innovation ecosystem, supported by significant financial strategies. Public capital expenditure in infrastructure has seen a remarkable surge, escalating over five-fold in the last decade to ₹11.11 trillion (3.4% of GDP) in 2024-25, and fostering substantial growth across national highways, railways, metro networks, and port capacities. Specialized institutions like NaBFID, which has sanctioned over $18 billion in loans, and market-based instruments like REITs and InvITs are crucial in bridging the immense financing gap, complemented by significant Foreign Direct Investment in major projects. Simultaneously, India is dedicated to fostering innovation, evident in its improved ranking on the Global Innovation Index (39th in 2024) and the burgeoning startup ecosystem that has created over 1.6 million jobs. While Gross Expenditure on R&D (GERD) as a percentage of GDP remains relatively low at around 0.64%-0.69% compared to global leaders, the government's strong commitment is reflected in the doubling of overall R&D expenditure over a decade and the establishment of the Anusandhan National Research Foundation (ANRF). Furthermore, the recently announced ₹1 lakh crore innovation fund underscores a concerted effort to boost deep-tech R&D and drive India's future competitiveness, even as challenges remain in increasing private sector R&D contributions and ensuring consistent early-stage funding for startups.

India's quest to engineer sustained economic growth hinges on its ability to synergise infrastructure development with technological innovation. While the government has demonstrated its commitment through increased capital outlay, asset monetisation, and financing reforms, the private sector's participation remains crucial. Strengthening the innovation ecosystem through greater R&D investment, start-up support, and digital infrastructure expansion will be instrumental in driving inclusive, sustainable progress. By addressing existing challenges, deepening capital markets, and fostering public-private collaboration, India is well-positioned to achieve its vision of becoming a global economic powerhouse, backed by resilient infrastructure and cutting-edge innovation. It delves into the intricate financial mechanisms, policy frameworks, and investment landscapes that are shaping India's journey towards becoming a developed nation. It explores how the nation is mobilizing resources, mitigating risks, and fostering an environment conducive to both large-scale physical development and disruptive technological advancements, ultimately aiming for inclusive and sustainable economic growth.

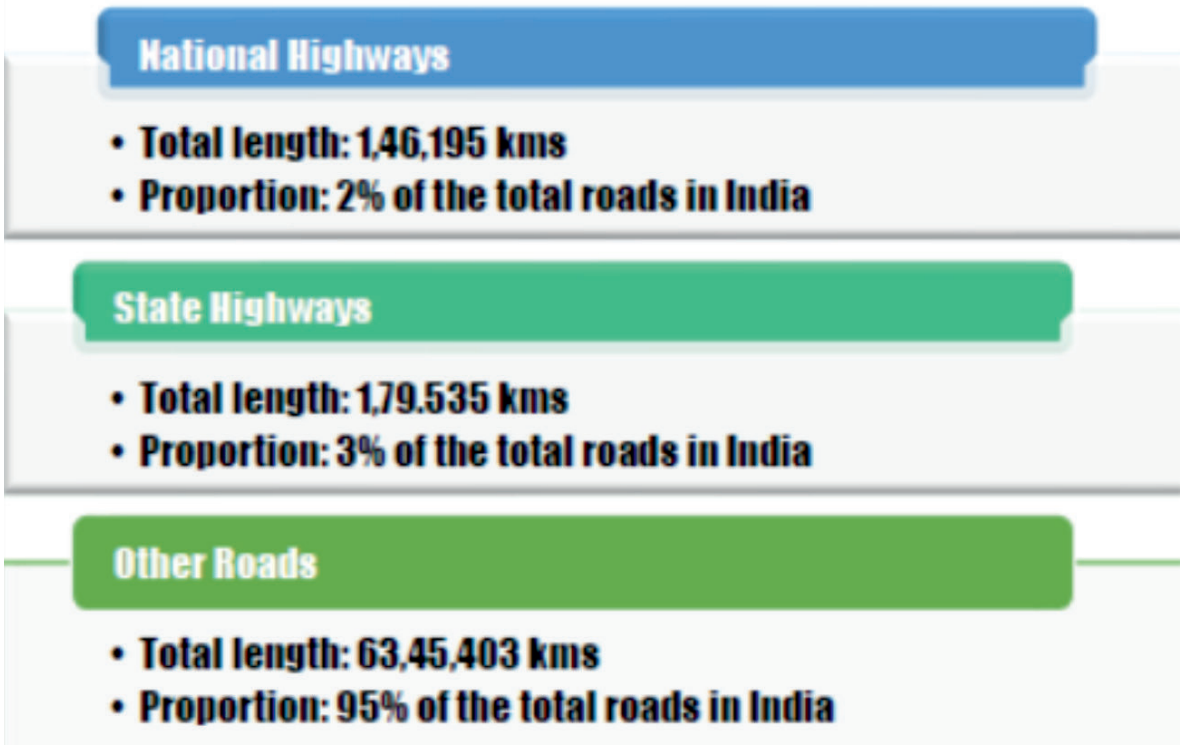
Highways to Growth: India's Expanding Road Infrastructure

Physical infrastructure is considered the backbone of every economy. From developing to developed, every economy continually strives to expand and upgrade its physical infrastructure to accelerate economic growth and enhance the quality of life for its citizens. Expansion of physical infrastructure brings several socio-economic benefits. This infrastructure enhances productivity, facilitates trade, attracts investment, creates job opportunities, facilitates market access, and reduces overall transportation costs. Considering the importance of physical infrastructure, the Indian government also strives to expand India's physical infrastructure and reap its numerous benefits. One of the key segments of physical infrastructure that the Indian government has emphasized in recent years is road infrastructure. The following section delivers a discussion on the strong momentum, which is noted in India in terms of road infrastructure expansion.

Major Road Segments in India

The road network in India is subdivided into three major categories:

Figure 1: Subdivision of Roads in India

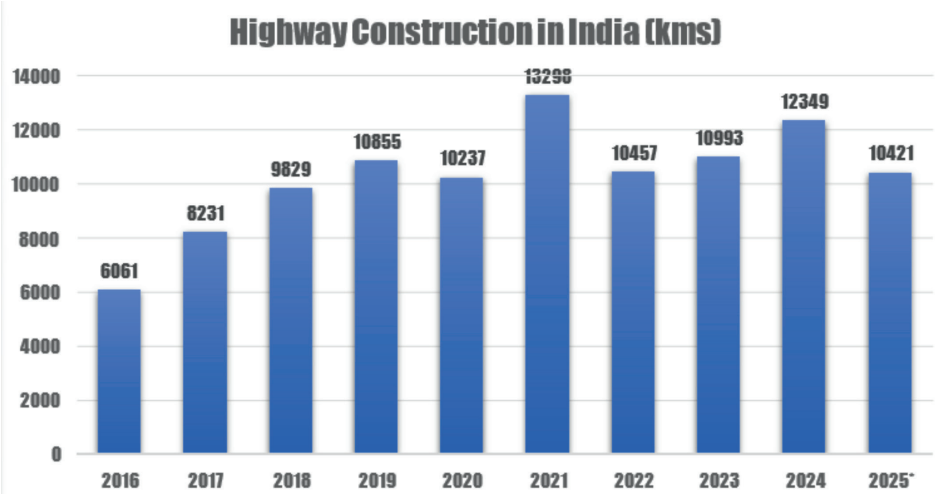


Source: Annual Report 2024-25, Ministry of Road Transport and Highways, Government of India

It is observed from Figure 1 that only highways comprise 5 per cent of India's overall road network. India's road networks mainly comprise other forms of roads.

Year-wise Expansion of Roadways in India

Figure 2: Highway Construction in India (kms)



Source: India Brand Equity Foundation (IBEF) 2025

Figure 2 demonstrates India's strong momentum in the expansion of roadways over the past 10 years. It is observed that the volume of road construction doubled in 2025, from the 6061 km of road construction in 2016 to 10421 km in 2025 (*till the first quarter).

Roads Construction under Bharatmala Pariyojana in India

Table 1: Construction of Roads under Bharatmala Pariyojana till 2024

Component	Length	Total Length Completed (in km)
	(in km)	**Up to 31.12.2024**
Economic Corridors	8,737	**5,986**
Inter Corridors Roads	2,889	**2,108**
Feeder Roads	973	**540**
National Corridors	1,777	**1,394**
National Corridor Efficiency Improvement	824	**732**
Expressways	2,422	**1,791**
Border Roads & International Connectivity Roads	1,619	**1,400**
Coastal Roads	77	**72**
Port Connectivity Roads	348	**120**
Balance Road Works under NHDP	6,758	**5,058**
Total - Bharatmala	**26,425**	**19,201**

Source: Annual Report 2024-25, Ministry of Road Transport and Highways, Government of India

In 2017, the Government of India introduced the Bharatmala Pariyojana to enhance the efficiency of commodity and citizen movement by constructing and integrating several economic corridors, national corridors, border and international connectivity roads, port connectivity roads, expressways, etc. From Table 1, it is observed that 73 per cent of India's targeted (for 2024) road construction has been completed till 31.12.2024 under the umbrella of Bharatmala Pariyojana.

Expansion of National High-Speed Corridors

Table 2: Expansion of National High-Speed *Corridors*

Sr. No.	Corridor Name	State	Length	Total Capital Cost (Rs. crore)
1	Agra – Gwalior	Uttar Pradesh, Madhya Pradesh	88	**4,613**
2	Kharagpur – Moregram	West Bengal	231	**10,247**
3	Tharad – Deesa – Mehsana – Ahmedabad	Gujarat	214	**10,534**
4	Ayodhya Ring Road	Uttar Pradesh	68	**3,935**
5	Pathalgaon – Gumla section of Raipur-Ranchi	Chhattisgarh, Jharkhand	137	**4,473**
6	Kanpur Ring Road	Uttar Pradesh	47	**3,298**
7	Northern Guwahati Bypass and Widening/ Improvement of Existing Bypass on NH 27	Assam	121	**5,729**
8	Elevated Nashik Phata – Khed Corridor	Maharashtra	30	**7,827**
	Total		**936**	**50,655**

Source: Annual Report 2024-25, Ministry of Road Transport and Highways, Government of India

Table 2 exhibits the recent expansion of national high-speed corridors in India. This high-speed corridor covers eight major states i.e., Uttar Pradesh, Madhya Pradesh, West Bengal, Gujarat, Chhattisgarh, Jharkhand, Assam, and Maharashtra. This new corridor projects are going to make addition of 936 km to India's high-speed corridor at a capex of Rs. 50655 crores.

Greenfield Expressways being Developed by MoRTH

Table 3: List of Greenfield Expressways being Developed by *MoRTH*

Source: Annual Report 2024-25, Ministry of Road Transport and Highways, Government of India

Sr. No.	Corridor Name	Length (km)	Total Capital Cost (Rs. crore)	Target Completion Year
1	Delhi - Mumbai Expressway	1,386	1,03,636	**FY 24-25**
2	Ahmedabad - Dholera	109	4,372	**FY 24-25**

3	Bengaluru - Chennai	262	17,356	**FY 24-25**
4	Delhi - Amritsar - Katra	669	38,905	**FY 25 -26**
5	**Kanpur – Lucknow Expressway**	63	4,219	**FY 25-26**
	Expressways Total	**2,489**	**1,68,488**	

India government also gave green signal for the development of 5 new corridors. These corridors are

1. Delhi Mumbai Expressway
2. Ahmedabad – Dholera
3. Bengaluru Chennai
4. Delhi Amritsar – Katra
5. Kanpur – Lucknow Expressway

These corridors will make addition of 2489 kms of new expressways. For this government already approved capex of Rs. 168488 crores. The first three corridors are expected to be completed by FY 2024-25, while remaining two will be finished by FY 2025-26.

Status of NH Projects under Implementation/Construction by MoRTH in North-East

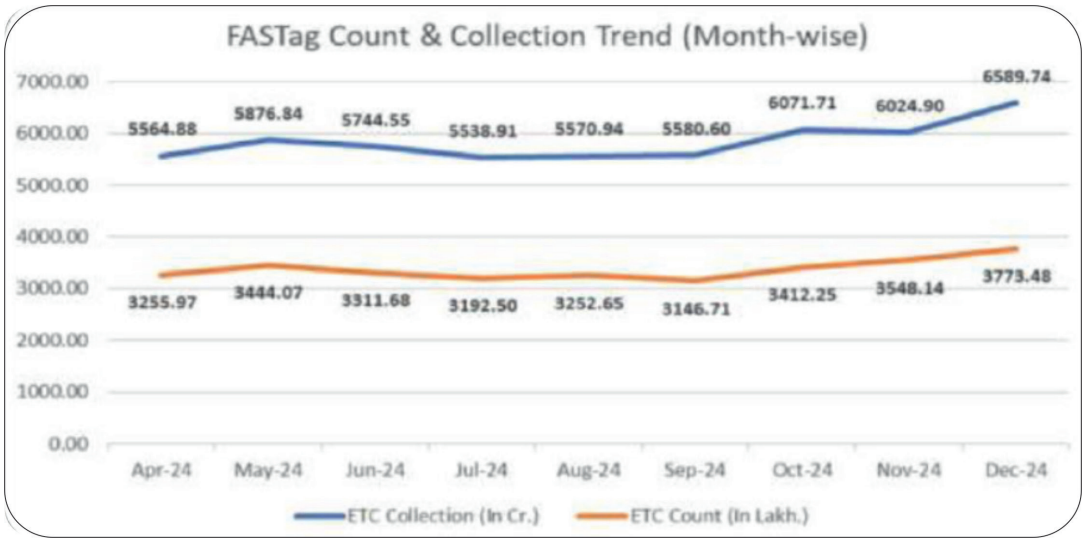
Table 4: NH Projects under Implementation/Construction by MoRTH in North-East

Sr. No.	State	Total Ongoing Projects		
		No of Projects	Length in km	Total Project Cost (in ` crore)
1	Assam	53	978	**34,777**
2	Arunachal Pradesh	19	354	**4,215**
3	Manipur	34	736	**11,052**
4	Meghalaya	16	301	**5,511**
5	Mizoram	14	436	**8,019**
6	Nagaland	28	589	**8,371**
7	Sikkim	13	197	**4,019**
8	Tripura	13	258	**6,488**
Total		**190**	**3,848**	**82,452**

Source: Annual Report 2024-25, Ministry of Road Transport and Highways, Government of India

Table 4 presents the existing status of NH projects that are in the process of implementation or construction by MoRTH in North-East India. Currently, there are 190 NH projects underway by MoRTH, which span across the seven sister states. These NH projects are expected to introduce 3848 kilometers of new NH, with an associated cost of Rs. 82452 crores.

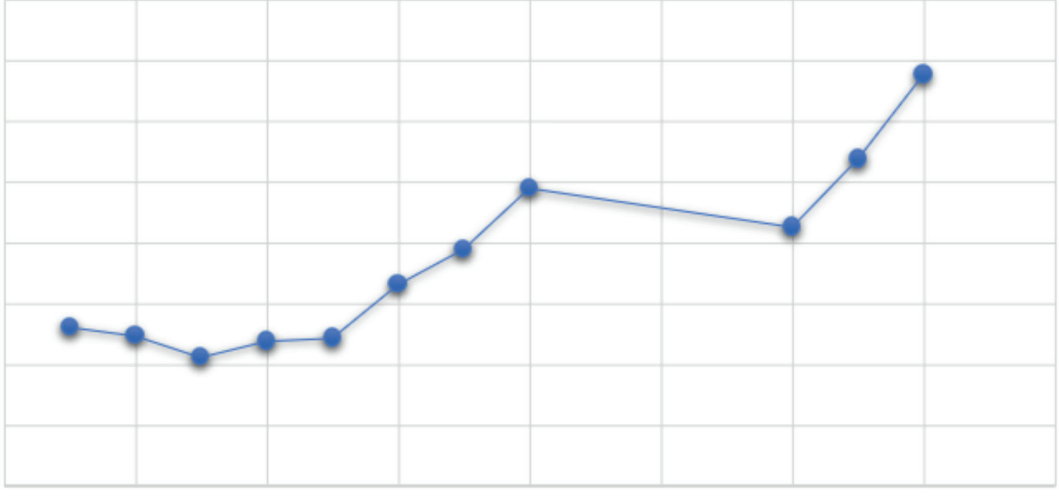
Figure 3: Monthly ETC Transaction Count & Collection



Source: Annual Report 2024-25, Ministry of Road Transport and Highways, Government of India

To facilitate the smooth flow of traffic at fee plazas and enhance transparency in the collection of user fees via FASTag, the National Electronic Toll Collection (NETC) program, which is the primary initiative of the Ministry of Road Transport and Highways, has been executed on a nationwide scale. A total of forty (40) banks, which include both Public and Private sector banks, are involved as Issuer banks for the issuance of FASTag to road users. Additionally, there are twelve (12) Acquirer banks responsible for processing transactions at fee plazas. As of June, 2025, banks have collectively issued more than 10.30 crore FASTags; the average daily revenue generated through Electronic Toll Collection (ETC) is approximately Rs. 192 crores, achieving a penetration rate of about 98.5% in total fee collection. Currently, there are 1,728 toll plazas (1,113 National Highways, 615 State Highways) operational with ETC infrastructure across all lanes. From Figure 3, it can be seen that there is a positive trend in Electronic Toll Collection. In February 2024, the total reached Rs. 6589.74 crores.

Figure 4: Number of Construction Equipment Units Sold



Source: India Brand Equity Foundation (IBEF) 2025

With the enhancement of road infrastructure and roadways, there is a noticeable increase in the sales of construction equipment. As illustrated in Figure 4, the upward trend in the sales of construction equipment units is evident, rising from 52,500 units in 2012 to 135,650 units by 2024.

Furthermore, beyond the areas discussed earlier, the Government of India has undertaken several initiatives including PM Gati Shakti and Pradhan Mantri Grameen Sadak Yojana aimed at strengthening and modernizing India's road infrastructure. These efforts not only enhance the quality of the road infrastructure but also provide a range of socio-economic benefits. This infrastructure increases productivity, facilitates trade, attracts investments, creates job opportunities, enhances market access, and reduces overall transportation costs.

India's Expanding Rail Infrastructure: Driving Connectivity and Growth

India has the world's fourth-largest rail network. Every day, Indian Railways operates around 13,523 passenger trains and 9,146 freight trains across the country. Passenger trains run at an average speed of 50.6 kmph, while freight trains average 24 kmph. Beyond being an essential part of daily life for millions, this vast network plays a critical role in driving India's economic growth by supporting industries, enhancing connectivity, and facilitating trade and logistics.

Induction of Modern Trains

Indian Railways' budget has increased by more than 9 times since 2014. Indian railways have introduced world-class trains such as:

- Vande Bharat Trains,
- Amrit Bharat Train,
- Namo Bharat Rapid Rail, etc.

Currently, 200 new Vande Bharat trains, 100 Amrit Bharat trains, 50 Namo Bharat rapid rail trains, and 17,500 general non-AC coaches are planned to revolutionise the travel experience for the masses over the next 2 to 3 years.

Track Upgradation

More than 31,000 km of new tracks have been laid since 2014. More than 45,000 km of tracks have been renewed since 2014. Indian Railways achieved track laying of 5100 Kms during FY24.

Total Capex Allocation

Between 2004 and 2014, the Government of India (GOI) allocated capital expenditure (capex) of around Rs. 3.62 lakh crore. Since 2014. More than Rs. 17 lakh crores have been allocated. Under the Union Budget 2025-26, the government allocated Rs. 3.02 lakh crore (approximately USD 34.7 billion), compared to Rs. 2.52 lakh crore (approximately USD 30.3 billion) in 2024- 25, to the Ministry of Railways.

Enhanced Production

Indian Railways is replacing its fleet with more safe and secure LHB coaches. Since 2014, Indian Railways has manufactured over 37,000 such coaches to provide enhanced safety and comfort. Further, 7,134 coaches were produced in 2024-25, marking an increase of 9% from the previous year's production of 6,541 coaches. 41,929 units of wagons made in 2024-25, surpassing the 37,650 units in 2023-24. 1,681 units of locomotives produced in 2024-25, marking a 19% increase

with 1,472 units in 23-24 (more than Europe, North America, South America, Africa and Australia combined).

Recent Initiatives

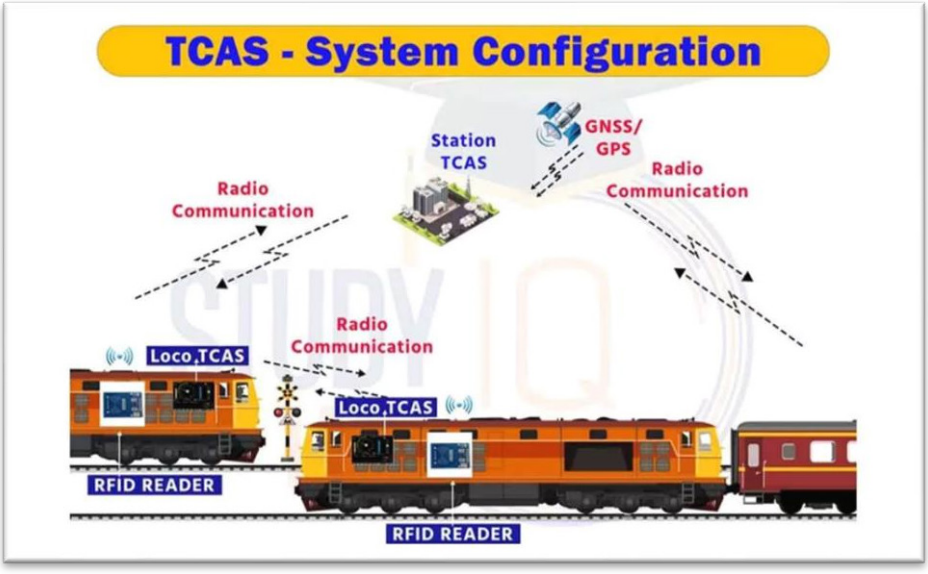
Pace of Electrification:

A total of 5,188 Rkm of broad-gauge railway network was electrified from 2004 to 2014, while over 45,000 Rkm was electrified during the period from 2014 to 2025. This electrification has resulted in annual savings of Rs. 2,960 crore for the railways (as of February 2025), thereby enhancing financial efficiency.

Electrical/Electronic Interlocking Systems:

To prevent accidents caused by human error, centralized control of points and signals has been implemented at over 6,600 stations as of March 31, 2025.

Kavach - Automatic Train Protection System:



Kavach is a domestically developed Automatic Train Protection (ATP) system. It is a highly advanced technology system that necessitates the highest level of safety certification (SIL-4). Kavach assists the Loco Pilot in operating trains within designated speed limits by automatically applying brakes if the Loco Pilot fails to do so, and it also ensures safe train operations during adverse weather conditions. The system has already been implemented over 1,548 Route kilometres on the South Central Railway and North Central Railway. Currently, work is ongoing on the Delhi-Mumbai and Delhi-Howrah corridors, covering approximately 3,000 Route kilometres. Trackside works have been completed for about 1,081 Route kilometres (705 Route kilometres on the Delhi - Mumbai section and 376 Route kilometres on the Delhi - Howrah section) on these routes.

Dedicated Freight Corridor (DFC):

Before 2014, no kilometres of the Dedicated Freight Corridor (DFC) were commissioned. After 2014, over 96% of the DFC, totalling 2,843 kilometres, has been completed, with the Eastern DFC measuring 1,337 kilometres finished and the Western DFC, at 1,506 kilometres, nearing completion.

Gati Shakti Cargo Terminal (GCT):

A total of 100 GCTs have been commissioned to lower logistics costs and enhance multi-modal transportation.

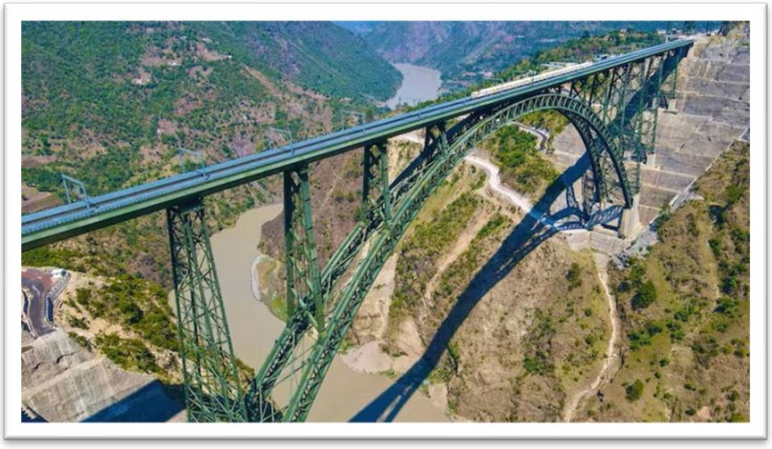
Amrit Bharat Station Scheme:

Over 1300 stations are undergoing redevelopment as part of the initiative, guaranteeing the implementation of world-class amenities.

PM Jan Aushadhi Kendra:

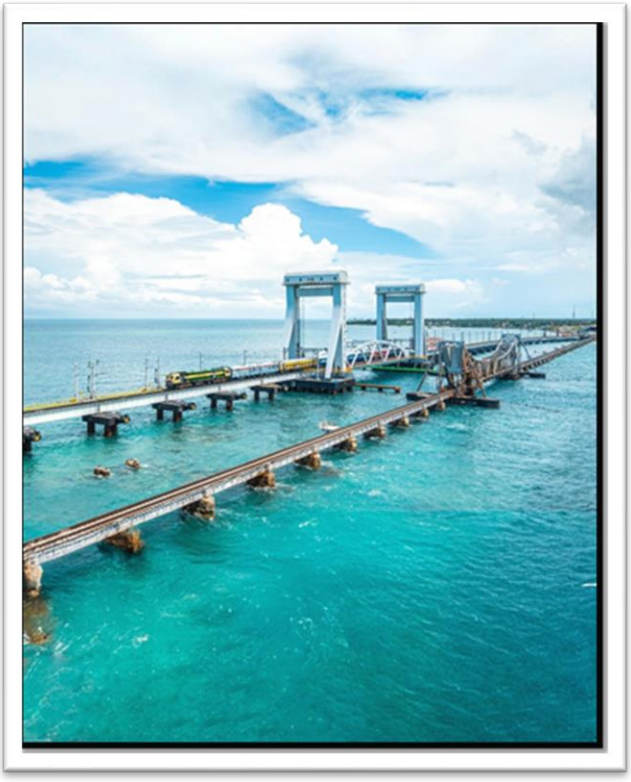
Currently, 68 PMJAKs are functioning at different Railway Stations, providing accessibility and the availability of affordable medical services on station grounds.

Chenab Bridge and Anji Khad Bridge:



The inauguration of the World's Highest Railway Arch Bridge and the Anji Khad Bridge, which is India's first cable-stayed rail bridge, took place in June 2025, officiated by the Prime Minister. The Anji Bridge is designed to function effectively in a challenging terrain. The Chenab Rail Bridge is located at an elevation of 359 meters above the river. This steel arch bridge spans 1,315 meters in length and has been engineered to endure seismic activity and wind conditions.

New Pamban Bridge:



The New Pamban Bridge was constructed by Rail Vikas Nigam Limited (RVNL), a Navratna PSU under the Ministry of Railways. This bridge is India's inaugural Vertical Lift Rail Sea Bridge, which has been dedicated to the nation, transforming rail connectivity between Rameswaram and Mainland India.

Key Features of the New Pamban Bridge are:

- The 72.5-meter navigational span can be lifted up to 17 meters, allowing larger ships to pass underneath.
- The new bridge is 3 meters higher than the existing one, improving sea connectivity.
- The substructure is designed for two tracks, with the superstructure initially accommodating a single line.
- The use of modern materials and engineering techniques will ensure the bridge's longevity.

- The bridge has been constructed with stainless steel reinforcement, high-grade protective paint, and fully welded joints.

Recent Additions:

On April 9, 2025, the Cabinet sanctioned the expansion of the 104 km Tirupati–Pakala–Katpadi railway line at an estimated expenditure of Rs. 1,332 crore.

On April 4, 2025, the Cabinet authorized four significant railway initiatives valued at approximately Rs. 18,658 crore, spanning 15 districts in Maharashtra, Odisha, and Chhattisgarh.

On February 7, 2025, the Cabinet endorsed the reorganization of the Waltair railway division. Approximately 410 km, which includes routes such as Palasa–Visakhapatnam–Duvvada, will remain under the South Coast Railway as part of the new Visakhapatnam division. The remaining 680 km, which includes routes like Kottavalasa–Bacheli, will be established as a new division under the East Coast Railway, with its headquarters located in Rayagada.

References

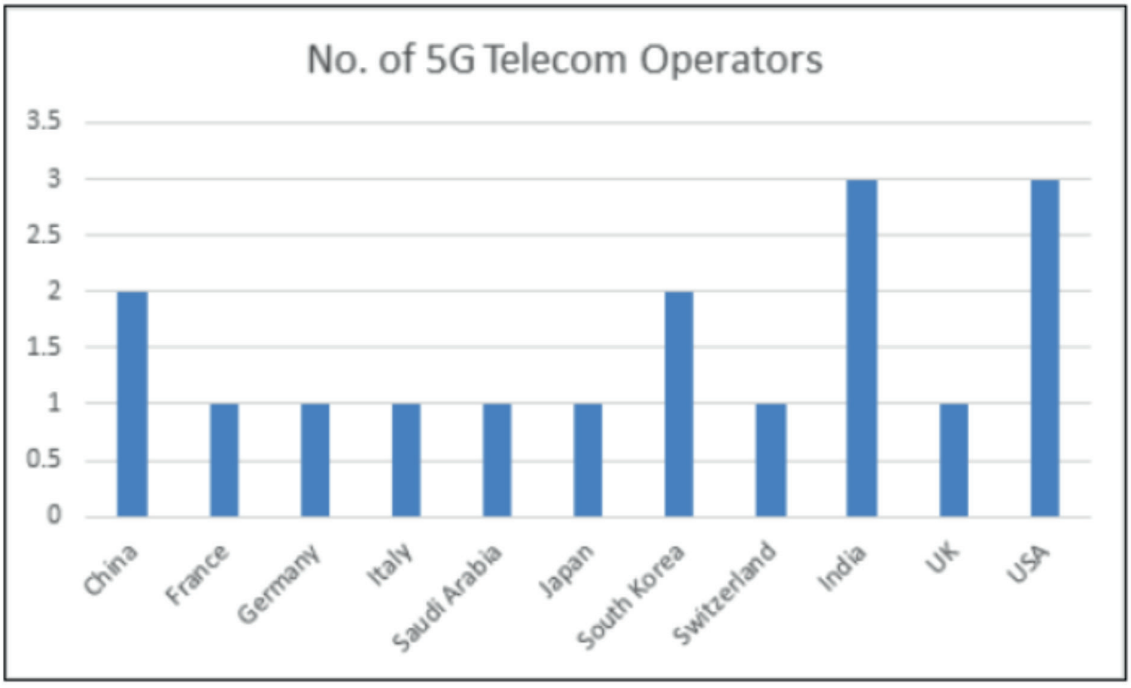
- https://morth.nic.in/sites/default/files/Annual-Report-English-with-Cover.pdf
- https://mospi.gov.in/download-reports
- https://www.ibef.org/download/1744102486_Roads-February-2025.pdf
- https://www.ibef.org/industry/indian-railways
- https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=154624&ModuleId=3#:~:text= In%20the%20last%2011%20years,built%20in%20last%20five%20years.
- https://www.pib.gov.in/PressReleasePage.aspx?PRID=2098788#:~:text=India's%20National%20Highway%20(NH)%20network,to%202%2C138%20km%20in%202024.
- https://www.pib.gov.in/PressReleseDetail.aspx?PRID=2139666

Telecommunication Infrastructure Development in India and Its Role in Economic Growth

India stands today as the world's second largest telecommunications market. This position reflects not just the size of its user base, but also the pace at which the country has expanded its digital impression over the last two decades. As of October 2024, the total telephone subscriber base in India reached 1,188.20 million, with a tele-density of 84.46% (www.ibef.org/industry/telecommunications)[7]. The Indian mobile economy is now considered one of the fastest-growing segments within the country, and it is set to contribute significantly to India's GDP in the coming years.

The backbone of this sector's rapid development has been a combination of government initiatives, technological advancement, and active participation from domestic and international players. These developments have enabled India to achieve notable milestones not just in mobile telephony but also in data services, internet penetration, and the adoption of next-generation technologies like 5G (Agiwal, M., Roy, A., & Saxena, N. 2016)[1].

Figure 1: Number of 5G Telecom Operators in Selected Countries

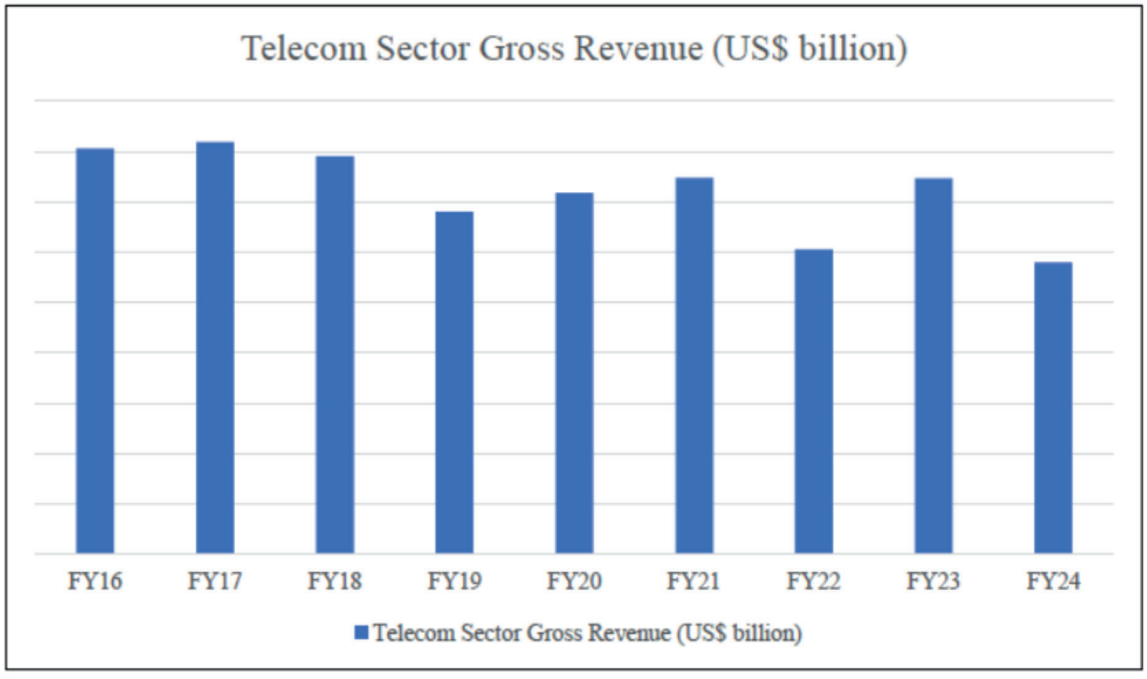


Source: India Brand Equity Foundation

Growth in Mobile and Internet Subscribers

One of the most remarkable indicators of India's telecom development is its mobile subscriber base (Narayana, M. R. 2011)[2]. In 2022, India registered over 1.2 billion mobile subscribers, making it the second-largest mobile phone market globally. The increased availability of affordable smartphones and cheaper data plans has played a crucial role in this growth. As a result, the country has seen a surge in mobile internet usage, app downloads, and digital transactions. India is also the second-largest country in terms of internet subscribers. By 2022, Indian users had downloaded over 28 billion apps, accounting for 5% of the 625 billion global downloads. The availability of 4G services across urban and rural India laid the foundation for this growth, and now 5G is emerging as the next phase.

Figure 2: Telecom Sector Gross Revenue



Source: India Brand Equity Foundation

Adoption of 5G and Technological Advancements

India's transition to 5G is progressing swiftly. According to Counterpoint Research, India is now the second-largest market for 5G smartphones, trailing only China. China holds a 32% global market share, while India commands 13%. The United States, with a 10% market share, ranks third. In the third quarter of 2024, India's smartphone market recorded a 3% year-on- year growth in volume, with a 12% year on year increase in value, marking the highest record in a single quarter. The rapid uptake of 5G smartphones across various price segments is driving this trend. To further advance the country's readiness for 5G, the government is focusing on fiberising telecom towers. As of

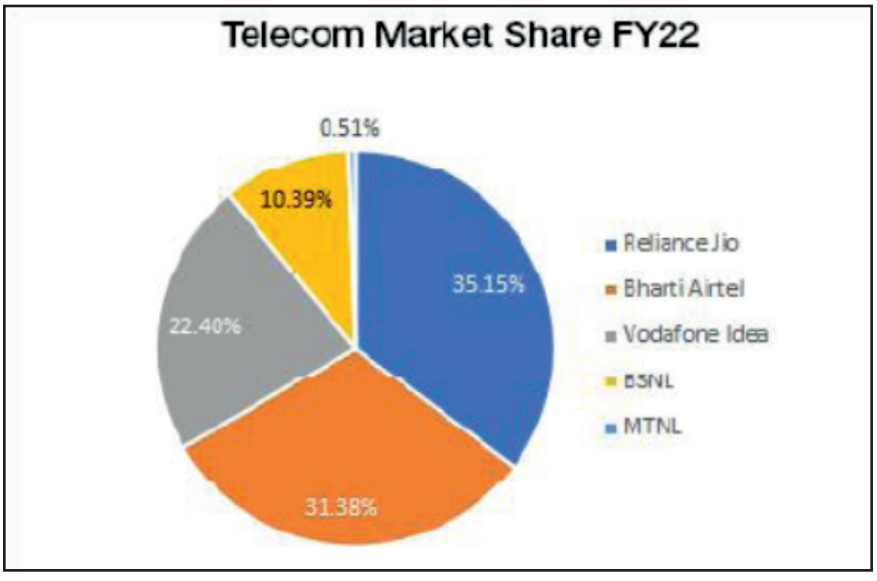
now, only 36% of towers are fiberised. The plan is to deploy 12 lakh telecom towers to ensure robust 5G coverage nationwide. Expanding infrastructure, the government plans to establish 100 laboratories within engineering colleges. These labs will focus on creating innovative applications using 5G technology, potentially opening up new business models and employment opportunities.

Telecom Operators and Market Share

As of September 2024, the wireless subscriber base for leading telecom operators in India stands as follows:

- Reliance Jio: 463.78 million
- Bharti Airtel: 276.68 million
- Vodafone Idea: 126.35 million
- BSNL: 33.50 million

Figure 3: Telecom Market Share FY22



Source: India Brand Equity Foundation

These numbers highlight the dominance of Jio and Airtel in the market. Their large user bases are reflective of competitive pricing strategies, wider network coverage, and faster adoption of new technologies.

Government Policies and Foreign Direct Investment (FDI)

The Indian telecom sector has benefited greatly from proactive policy support (Singh, H. V., Soni, A., & Kathuria, R. 2000)[3]. The FDI cap in the telecom sector was increased from 74% to 100% via the automatic route in October 2021. As a result, total FDI inflow in the telecom sector reached Rs. 2,40,439 crore (US$ 39.99 billion) between April 2000 and September 2024. Gross revenue from the telecom sector in FY24 stood at Rs. 2.4 lakh crore (US$ 29.00 billion). For the second quarter of

FY25, the sector generated Rs. 91,426 crore (US$ 10.46 billion) in revenue. These figures reflect the strong commercial viability and growth potential of the sector.

Investment in Infrastructure and Data Centers

Infrastructure is a critical component in the development of any telecom ecosystem (Li, Z. 2019)[4]. Recognizing this, several companies have made significant investments. For instance, STT GDC invested Rs. 2,000 crore (US$ 242.33 million) in two data centers in Pune in May 2023. Similarly, Jio partnered with EESL in March 2023 to provide 1 million smart prepaid meters in Bihar. In another major development, the Competition Commission of India (CCI) approved the acquisition of 100% of ATC Telecom Infrastructure Pvt. Ltd. by Data Infrastructure Trust. Such moves signal increasing consolidation and modernization within the sector.

Supportive Schemes and Strategic Initiatives

Several government schemes have further strengthened India's telecom backbone. The Production-Linked Incentive (PLI) Scheme for telecom and networking products, with a total outlay of Rs. 12,195 crore (US$ 1.65 billion), has attracted global players like Ericsson, Nokia, Samsung, and Cisco to manufacture in India. As of March 2023, the PLI scheme for Large- Scale Electronics Manufacturing (LSEM) had attracted investments of Rs. 5,998 crore (US$ 726.77 million), leading to production worth Rs. 2,76,903 crore (US$ 33.55 billion), including exports of Rs. 1,28,886 crore (US$ 15.61 billion).

Global Collaboration and Future Goals

India is looking beyond 5G towards the future of telecom (Gurugopinath, R., & Venugopal, B. 2025)[5]. The country has formed a strategic partnership with the European telecom industry through the Bharat 6G Alliance. This cooperation aims to jointly develop the next generation of communication technologies. The Department of Telecommunications (DoT) has also created a Sixth Generation (6G) Innovation Group to drive India's future readiness in telecom. With the launch of 5G services on October 1, 2022, by Prime Minister Narendra Modi, India took a major step forward.

Telecom in National Budgets

The telecom sector has received generous allocations in recent Union Budgets. In 2023-24, Rs. 97,579.05 crore (US$ 11.92 billion) was allocated to the Department of Telecommunications. In 2025-26, this figure was Rs. 81,005.24 crore (US$ 9.27 billion), showing continued support. Out of the 2023-24 allocation, Rs. 5,000 crore (US$ 611.1 million) was dedicated to BharatNet and Rs. 400 crore (US$ 48.88 million) to research and development.

Water and Sanitation Infrastructure Development in Indian Economic Growth

Clean water and proper sanitation are fundamental to a healthy, productive population (Leal Filho, Walter, et al., eds 2022)[6] In India, major strides have been made in recent years to improve water supply and sanitation services, especially in rural areas. These efforts are not only improving public health and living conditions but are also playing a vital role in supporting India's broader economic development *(Gupta, I., & Mitra, A. 2004)*. The infrastructure development in this sector is aligned with Sustainable Development Goal 6 (SDG 6), which seeks to ensure availability and sustainable management of water and sanitation for all.

India's Sanitation Journey: From Open Defecation to Safe Hygiene

The Swachh Bharat Mission (SBM), launched in 2014, was a major milestone in India's sanitation revolution. It set a goal to make India open defecation free (ODF) by October 2019. By constructing more than 110 million toilets and running massive awareness campaigns, India achieved near-complete sanitation coverage in rural areas. Today, SBM has moved into its second phase, known as Swachh Bharat Mission Phase II (SBM 2.0), which focuses on ODF- plus goals. This includes maintaining toilet usage, managing solid and liquid waste, and ensuring cleanliness in villages. As of 2024, more than 60% of rural villages have implemented systems for waste management, including biogas units, compost pits, and greywater reuse systems. The government is also promoting Menstrual Hygiene Management (MHM) through awareness campaigns and the provision of sanitary products in schools and public facilities.

Rural Water Supply: From Access to Assurance

The Jal Jeevan Mission (JJM), launched in 2019, aims to provide functional household tap connections (FHTCs) to every rural household by 2024. As of mid-2024, over 13 crore rural households have been provided with tap water connections, compared to just 3.2 crore in 2019. The mission also emphasizes source sustainability, community ownership, and regular water quality monitoring. Under this mission, Village Water and Sanitation Committees (VWSCs) are formed to plan, implement, and manage water supply schemes.

The government is also investing in the development of IoT-based smart monitoring systems to track water delivery in real time, especially in remote areas. The Swajal Project and the

National Water Quality Sub-Mission (NWQSM) are addressing the challenges of contaminated water sources in regions affected by fluoride, arsenic, and other pollutants. More than 28,000 affected habitations are being targeted with safe drinking water solutions, including solar- powered purification units.

Investments and Job Creation

The government has committed more than ₹3.6 lakh crore to water and sanitation projects under SBM and JJM combined. States like Telangana, Gujarat, and Bihar have added their own funds to expand the coverage and quality of piped water supply. This massive investment has created millions of jobs in construction, plumbing, maintenance, and manufacturing. In rural India, these programs have generated income for local workers, while also building skills in water testing, sanitation awareness, and operation of water systems.

Recent Innovations and Way Forward

To ensure long-term sustainability, the government has introduced digital dashboards that track water service delivery at the village level. Real time data collection tools and mobile applications have been introduced to report leakages, water outages, and water quality issues. Also, Gobardhan Scheme is being expanded to promote bio gas production from cattle dung and organic waste, creating a circular economy approach to rural waste management.

In sanitation, new technologies like faecal sludge treatment plants (FSTPs) are being promoted in smaller towns, while campaigns like 'Har Ghar Jal' and 'Suvidha Toilets' are encouraging behavioral changes and improving access in marginalized communities. India's journey in building water and sanitation infrastructure is transforming both rural and urban landscapes. These services not only reduce disease and improve quality of life but also empower people economically, particularly women and children. Continued focus on innovation, community participation, and sustainable practices will further strengthen this sector's contribution to India's economic and social development.

References

- Agiwal, M., Roy, A., & Saxena, N. (2016). Next generation 5G wireless networks: A comprehensive survey. *IEEE communications surveys & tutorials*, *18*(3), 1617-1655.
- Narayana, M. R. (2011). Telecommunications services and economic growth: Evidence from India. *Telecommunications Policy*, *35*(2), 115-127.
- Singh, H. V., Soni, A., & Kathuria, R. (2000). Telecom policy reform in India. *The World Bank*.
- Li, Z. (2019). Telecommunication 4.0. In *IEEE International Conference on Communications. IEEE*.
- Gurugopinath, R., & Venugopal, B. (2025). Policy and Regulatory Challenges in Implementing Beyond 5G and 6G Networks in Rural India: Ensuring Right to Health. In *Addressing B5G and 6G Network Connectivity Issues in Rural Regions* (pp. 59-88). IGI Global Scientific Publishing.
- Leal Filho, W., Azul, A. M., Brandli, L., Lange Salvia, A., & Wall, T. (Eds.). (2022). *Clean water and sanitation*. Cham: Springer International Publishing.
- www.ibef.org/industry/telecommunications
- Gupta, I., & Mitra, A. (2004). Economic growth, health and poverty: An exploratory study for India. *Development policy review*, *22*(2), 193-206.

India's Port and Energy Infrastructure: Driving Economic Growth and Global Competitiveness

India's port and energy infrastructure is undergoing a remarkable transformation, underpinned by robust government initiatives, substantial private sector investment, and a growing emphasis on sustainability and digital innovation. The country's ports, which handle over 95% of its trade by volume, have seen their cargo handling capacity double over the past decade, reaching 630 million tonnes per annum (mtpa) at major ports by March 2024. When combined with non- major ports, the total capacity stands at 2,690 mtpa, with ambitious targets set to exceed 3,500 mtpa by 2030 and reach 10,000 mtpa by 2047 under the Maritime India Vision and Amrit Kaal Vision. In the current financial year (April–November 2024), major ports have already handled

549.47 million tonnes of cargo, marking a 2.59% increase compared to the same period last year.

The government's commitment to port modernisation is evident in the completion of 98 projects worth over ₹32,000 crore, which have increased annual port capacity by more than 230 mtpa. Landmark projects such as the Vadhavan Port, with an estimated investment of

₹76,000 crore, signal India's intent to build world-class port infrastructure and enhance logistics efficiency, particularly in the western region. The Sagarmala Programme, a flagship initiative, aims to modernise and expand port infrastructure, improve connectivity through road, rail, and inland waterways, and promote port-led industrialisation. Over 600 projects worth ₹6.5 trillion have been identified under the Sagarmala initiative, with significant progress in port connectivity and coastal development. The National Perspective Plan and the Port Modernisation Plan further support these efforts, incentivising private sector participation through public-private partnerships (PPPs) and attracting foreign investment.

Sustainability and digital transformation are at the heart of India's port strategy. The government has mandated the introduction of Green Tugs and launched the Harbour Craft Green Transition Program to accelerate the adoption of cleaner fuels and technologies. The Coastal Green Shipping Corridor along the Kandla–Tuticorin route is India's first large-scale initiative to promote eco-friendly maritime transport. Ports are investing in solar power plants—Cochin Port boasts one of the largest such installations—and advanced waste management systems to reduce pollution and carbon emissions. The shift towards cleaner fuels like LNG and hydrogen is accelerating, with several ports already offering LNG bunkering facilities. V.O. Chidambaranar Port is emerging as a green hydrogen-ammonia hub, with pilot projects for green hydrogen production underway.

Policy reforms are further strengthening the sector. The Indian Ports Bill, 2025, aims to consolidate laws related to port management and promote integrated development. Recent legislative moves, such as the Carriage of Goods by Sea Bill, 2024, and the Coastal Shipping Bill, 2024, provide a

modern legal framework and boost investor confidence. International collaboration is also on the rise; India and Singapore have signed a letter of intent to establish a green and digital shipping corridor, which will accelerate the adoption of zero-emission technologies and digital solutions in the shipping sector.

On the energy front, India's infrastructure is keeping pace with its economic ambitions. The country's installed electricity generation capacity reached approximately 430 gigawatts (GW) by March 2024, with renewables accounting for over 170 GW—about 40% of the total. This reflects a strong commitment to clean energy, with targets to achieve 500 GW of non-fossil fuel capacity by 2030. Refining capacity stands at 254 million tonnes per annum (MTPA) as of April 2024, making India one of the world's largest refining hubs. The government's focus on green hydrogen is particularly notable, with ports being positioned as key hubs for green hydrogen production, storage, and export—part of a vision to produce 5 million tonnes of green hydrogen by 2030.

The impact of these developments on India's growth is profound. Enhanced port and energy infrastructure is reducing logistics costs, improving trade competitiveness, and attracting foreign investment. The expansion of digital platforms and smart technologies is streamlining operations, reducing turnaround times, and making Indian ports more attractive to global shipping lines. The emphasis on sustainability is not only addressing environmental challenges but also positioning India as a leader in green shipping and clean energy. These initiatives are creating jobs, fostering innovation, and supporting the government's vision of a self-reliant, digitally empowered, and environmentally sustainable India.

Table 1: Key Port and Energy Infrastructure Metrics (2024)

Sector	Metric	Value (2024)
Ports	Cargo handling capacity (major ports)	1,630 mtpa
Ports	Cargo handling capacity (non-major ports)	1,081 mtpa
Ports	Total port capacity	2,690 mtpa
Ports	Market size (ports infrastructure)	USD 6.89 billion
Energy	Installed electricity capacity	430 GW
Energy	Renewable energy capacity	170 GW (40% of total)
Energy	Refining capacity	254 MTPA

Sources: Ministry of Ports, Shipping & Waterways; Central Electricity Authority; Ministry of Petroleum and Natural Gas; IMARC Group; TechSci Research; India Infrastructure PublishingAdditional Government *Initiatives*

- **Inland Waterways Development:** The Inland Waterways Authority of India (IWAI) is investing to improve infrastructure on national waterways, enhancing connectivity and trade.

- **Shipbuilding Expansion:** The government aims to make India one of the top five shipbuilding nations by 2047, with plans to increase shipments like railway spur lines are improving multimodal logistics and reducing transit times.
- **Union Budget 2025 Incentives:** New incentives for domestic shipbuilding, inland waterways, and ship recycling are boosting the maritime ecosystem.
- **Bharat Container Shipping Line:** The Establishment aims to reduce dependence on foreign shipping companies.

PM Gati Shakti Initiative: Infrastructure projects.

India's port and energy infrastructure sectors stand at a pivotal juncture, driving the nation's economic growth, enhancing global trade competitiveness, and supporting the country's ambitious sustainability goals. The significant investments in port modernisation, expansion of renewable energy capacity, and the adoption of cutting-edge digital technologies underscore India's commitment to building resilient and future-ready infrastructure. Government initiatives such as the Sagarmala Programme, Maritime India Vision 2030, and the recent policy reforms are creating an enabling environment for private sector participation and international collaboration, further accelerating progress. As India continues to integrate green technologies and streamline logistics, these sectors will not only reduce costs and increase efficiency but also contribute substantially to job creation and innovation. Ultimately, the strategic development of port and energy infrastructure will be instrumental in realizing India's vision of becoming a $30 trillion economy by 2047, positioning the country as a global leader in sustainable industrial growth and maritime excellence.

References

- https://www.imarcgroup.com/india-ports-infrastructure-market
- https://www.pib.gov.in/PressReleasePage.aspx?PRID=2089049
- https://www.techsciresearch.com/report/india-ports-infrastructure-market/3745.html
- https://shipmin.gov.in/sites/default/files/Annual%20Report%202024-25%20-%20English.pdf

Healthcare Infrastructure Development in India: Progress and Challenges

Healthcare infrastructure refers to the physical and organizational structures needed to deliver health services. This includes hospitals, clinics, diagnostic labs, medical equipment, and the health workforce. Healthcare infrastructure forms the backbone of a nation's health system. In India, a rapidly growing population, urbanization, and changing disease patterns have placed immense pressure on healthcare infrastructure. In India, ensuring equitable access to quality healthcare remains a major policy challenge. This paper critically analyzes the progress in healthcare infrastructure development and the strategic roadmap ahead.

1. Health Expenditure in India

Table 1: Health Expenditure Statistics of India

Year	Current Health Expenditure (% of GDP)	Current Health Expenditure per Capita (current US$)	Domestic General Government Health Expenditure (% of current health expenditure)	Out-of-Pocket Expenditure (% of current health expenditure)
2018	2.86	57.47	34.29	53.23
2019	2.95	60.69	35.07	52
2020	3.34	63.83	36.25	49.51
2021	3.35	75.55	40.4	45.11
2022	3.31	79.52	39.11	45.98

Source: World Health Organisation Global Health Expenditure Database, 2025

There is a consistent increase in health expenditure as a percentage of GDP, reflecting heightened prioritization of the health sector. It increased from 2.86% in 2018 to a peak of 3.35% in 2021, showing slight improvement in government health spending efforts, possibly due to COVID-19.

Per capita health expenditure rose steadily, reflecting better investment in individual health care services. It rose significantly during the pandemic (2020–2021), reaching $79.52 in 2022.

Government share of expenditure increased from 34.29% in 2018 to 40.4% in 2022, indicating a slow shift towards public provisioning.

Out-of-pocket expenditure declined from 53.23% in 2018 to 45.11% in 2021, suggesting a reduction in financial burden on individuals, though it remains high by global standards.

2. Health Facilities across India

Table 2: Number of Health Facilities across India (As on 31st March 2023)

Health Facilities	Rural	Urban	Total
Sub-Centres	165639	3976	1,69,615
Primary Health Centres	25354	6528	31,882
Community Health Centres	5491	868	6,359
Sub-Divisional/ District Hospitals		1340	1340
District Hospitals		714	714
Medical Colleges		362	362

Source: Ministry of Health & Family Welfare (https://mohfw.gov.in)

Sub-Centres (SCs): A total of 1,69,615 Sub-Centres are functioning both in rural and urban areas across India. In which, 1,65.639 SCs are functioning in rural areas and 3,976 SCs in urban areas.

Primary Health Centres (PHCs): Correspondingly, 31,882 Primary Health Centres are functioning in both rural and urban areas in India. In which 25,354 PHCs are functioning in rural areas and 6,528 PHCs in urban areas.

Community Health Centres (CHCs): There are 6,359 Community Health Centres functioning in the country, consisting of 5,491 rural CHCs and 868 urban CHCs.

Sub-Divisional / District Hospitals (SDHs): 1,340 Sub-Divisional / District Hospitals, catering to both rural and urban areas, are functioning in the country.

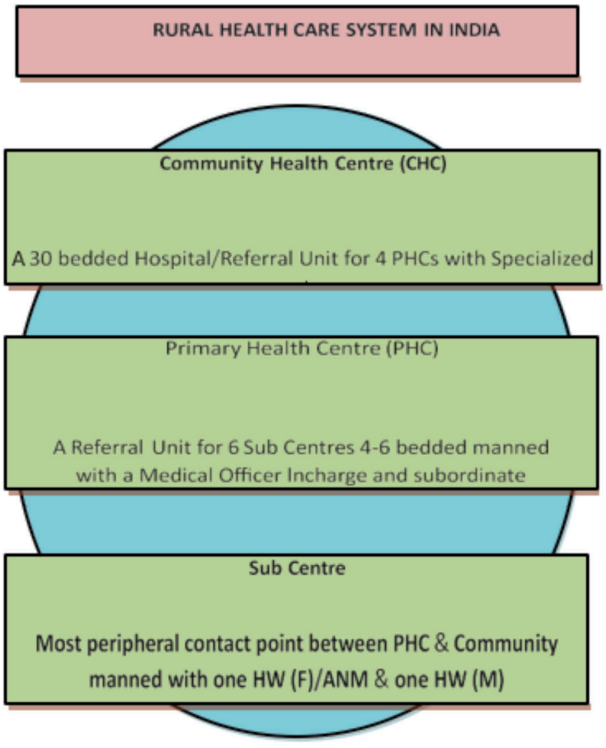
District Hospitals (DHs): There are 714 District Hospitals catering services to both rural and urban areas in the country.

Medical Colleges (MCs): There are 362 Medical Colleges that cater to both rural and urban areas are functioning in the country.

3. Rural Health Care System in India

3.1. *Structure and Current Scenario*

Rural areas of the country have a three-tier healthcare system, structured around the following population norms:



Norms for Health Care Infrastructure System		
Centre	Population Norms *	
	Plain Area	Hilly/Tribal /Difficult Area
Health Sub Centre	5000	3000
Primary Health Centre	30000	20000
Community Health Centre	120000	80000
*Number of persons covered under the services of a particular Facility (SC, PHC & CHC)		

Source: Ministry of Health & Family Welfare (https://mohfw.gov.in)

As per the population norms, the average population covered by a Sub-Centre, PHC and CHC in plain areas are 5,000, 30,000 and 1,20,000 respectively in plain areas and 3,000, 00,000 and 80,000 respectively in hilly or tribal area as on 31st March, 2023.

Table 2: Rural Health Infrastructure -Norms and Level of Achievements (All India)*

S. No.	Indicators	National Norms		Status (2023)	
1	**Rural Population (mid-year population 2023, as on 1st July 2023) covered by:**	General	Tribal Area	Rural Area	Tribal Area
	Sub-Centre	5000	3000	5450	3564
	Primary Health Centre (PHC)	30000	20000	35602	24565
	Community Health Centre (CHC)	120000	80000	164388	98687
2	Number of Sub-Centres per PHC	6		7	7
3	Number of PHCs per CHC	4		5	4
4	Average Area (Sq. Km) covered by:				
	Sub-Centre	19.30		19.17	
	PHC	102.69		132.16	
	CHC	514.87		530.96	

S. No.	Indicators	National Norms	Status (2023)
5	Average Radial Distance (Kms) covered by:		
	Sub-Centre	2.48	2.47
	PHC	5.72	6.48
	CHC	12.80	13.00
6	**Average Number of Villages covered by:**	**Rural Area**	
	Sub-Centre	4	
	PHC	26	
	CHC	121	

Source: Ministry of Health & Family Welfare (https://mohfw.gov.in)

*Number of persons covered under the services of a particular Facility (SC, PHC & *CHC)*

The average population covered by a Sub-Centre, PHC and CHC are 5,450, 35,602 and 1,64,388 respectively in rural areas; whereas, 3,564, 24,565 and 98,687 in tribal areas as on 31st March, 2023. While the rural health system is widespread, a comparison against the national norms shows that the average population coverage per facility exceeds the recommended limits. For instance, each CHC in rural areas covers approximately 1,64,388 people against the norm of 1,20,000, indicating an overstretched secondary healthcare network. Similarly, PHCs and SCs in both rural and tribal areas are servicing more than the population threshold recommended under Indian public health norms, thereby stressing the existing infrastructure.

4. Human Resources

Table 3: Human Resources *Facilities*

Parameters	In-position	
	Rural	Urban
Health Worker (Male+ Female) at SCs	239911	
Health Worker Female at PHCs	27003	21623
Doctors/ Medical Officers at PHCs	32901	7682
Pharmacists at PHCs	20118	5466
Lab Technicians at PHCs	15026	4813
Staff Nurse at PHCs	37736	10196
GDMOs / Medical Officers at CHCs	17240	2705
Surgeons at CHCs	913	1922
Obstetricians & Gynecologists at CHCs	1442	
Physicians at CHCs	992	
Pediatricians at CHCs	1066	

Parameters	In-position	
	Rural	Urban
Radiographers at CHCs	2463	565
Pharmacists at CHCs	7579	1313
Lab Technicians at CHCs	8210	1576
Nursing Staff at CHCs	41604	9455
Doctors & Specialists at SDHs	17723	
Paramedical Staff at SDHs	42909	
Doctors & Specialists at DHs	27304	
Paramedical Staff at DHs	92884	

Source: Ministry of Health & Family Welfare (https://mohfw.gov.in)

The human resource data also highlights a stark rural-urban disparity. While rural areas possess a larger number of basic health facilities, there is an evident shortage of specialized medical staff. For example, only 913 surgeons and 1,066 pediatricians are posted at CHCs in rural areas, compared to significantly higher availability in urban CHCs. Additionally, the overall staffing in rural PHCs and CHCs for pharmacists, nurses, and laboratory technicians remains inadequate in relation to the population served.

Conclusion

In conclusion, while India has made commendable strides in increasing health expenditure and expanding basic infrastructure, the health system continues to face significant challenges in terms of resource distribution, physical accessibility, and availability of specialized human resources, especially in rural and tribal areas. These disparities call for targeted policy interventions to ensure equitable access to quality healthcare across all regions.

Innovation as the Engine of India's Growth

India's growth ambitions in the 21st century are firmly anchored in the transformative power of innovation, positioning the country as a rising global leader across technology, industry, and academia[1]. With a youthful, tech-savvy population and rapidly expanding digital infrastructure, India's innovation landscape is thriving, evidenced by a startup ecosystem that now encompasses over 100,000 ventures, including more than a hundred unicorns, and a surge in patent filings that has doubled in the past decade to over 80,000 annually by 2025[2]. Innovation is no longer confined to a few sectors; it spans artificial intelligence, deep tech, clean energy, fintech, logistics, healthcare, and manufacturing, reflecting a holistic drive toward sustainable, inclusive, and globally competitive economic modernisation. The convergence of public and private collaboration, alongside significant investment from both domestic and international sources, is accelerating the translation of research into market-ready solutions and propelling India's ascent in the Global Innovation Index, now ranked among the top 40 nations worldwide[3].

Looking ahead, India's innovation-driven strategy is designed to ensure that the fruits of technological advancement are widely distributed, bridging urban-rural divides and empowering marginalized communities. The nation's ambition extends beyond domestic markets, aiming to export intellectual property, talent, and best practices while addressing pressing challenges such as climate change, healthcare access, and digital inclusion. Through sectoral diversity, robust entrepreneurial ecosystems, and a commitment to sustainability, India is charting a course toward a knowledge-driven economy that leverages innovation to create high-value jobs, solve complex societal problems, and secure a resilient, globally influential future for its citizens and the world.

Role of innovation in economic transformation and global competitiveness

Innovation is widely recognized as the engine that drives economic transformation and enables nations to secure a competitive edge in the global economy. At its core, innovation refers to the creation and application of new ideas, technologies, processes, and business models that generate value for both markets and society. Historically, from the industrial revolutions to the digital age, economies that have prioritised innovation have consistently outpaced those that remain static, leveraging technological advancements to boost productivity, efficiency, and profitability[4]. The transformative power of innovation is evident in its ability to disrupt established industries, giving rise to new sectors and markets while rendering obsolete those that fail to adapt. This process, often termed "creative destruction," is fundamental to economic dynamism, as it continuously

1 https://varindia.com/news/india-2025-embracing-a-new-era-of-technological-innovation
2 https://www.bluekraft.in/indias-innovation-renaissance-policy-reforms-and-youth-empowerment/
3 https://www.ciol.com/cxo-insights/top-10-gen-ai-trends-driving-indias-innovation-growth-in-2025-8852584
4 https://www.econstor.eu/bitstream/10419/184449/1/cer-2017-0028.pdf

reallocates resources to more productive uses and fosters the emergence of high-value industries. For example, the rapid adoption of digital technologies such as artificial intelligence, the Internet of Things, and blockchain has revolutionized sectors ranging from manufacturing and finance to healthcare and energy, driving efficiency gains, reducing costs, and improving the quality of goods and services[5]. Innovation not only propels individual companies forward but also catalyses broader economic growth by attracting investment, creating jobs, and stimulating demand across supply chains. Countries that nurture innovation-friendly environments—through investments in research and development, education, and infrastructure—tend to experience faster economic growth and greater resilience to external shocks, as evidenced by their higher rankings in global innovation indices and GDP per capita[6].

The link between innovation and global competitiveness is both direct and profound. In an increasingly interconnected world, national economies are judged not only by their resource endowments but by their ability to generate and commercialize new ideas. Innovation ecosystems, which encompass entrepreneurs, investors, academic institutions, and corporations, play a pivotal role in translating ideas into marketable products and services[7]. The presence of a robust innovation ecosystem signals to global investors and partners that a country is a fertile ground for high-value business opportunities. For instance, the rise of fintech, renewable energy, and digital payment solutions in countries like India has not only transformed domestic markets but also positioned these nations as global leaders in their respective fields. Moreover, innovation enhances a country's ability to participate in global value chains, as it enables the production of more complex, high-quality goods and services that are in demand worldwide[8]. The positive correlation between innovation performance and competitiveness indices underscores the fact that countries with strong innovation capabilities are better equipped to adapt to changing market conditions, anticipate future trends, and maintain leadership in key industries. Ultimately, sustained investment in innovation—both by the public and private sectors—is essential for any nation aspiring to achieve long-term economic transformation and secure a prominent position on the global stage. As automation and digitalization accelerate, the imperative to innovate becomes even more critical, ensuring that economies remain agile, inclusive, and capable of meeting the challenges of the 21st century.

Emerging innovation hubs and technology clusters

India's landscape of innovation is increasingly defined by the rise of dynamic technology clusters and innovation hubs across key urban centers such as Bengaluru, Hyderabad, Pune, and others. These hubs serve as focal points for the convergence of academic research, industry expertise, startup entrepreneurship, and public sector support, creating ecosystems that are both locally grounded

5 https://events.development.asia/learning-events/innovation-economic-transformation
6 https://www.econstor.eu/bitstream/10419/184449/1/cer-2017-0028.pdf
7 https://www.weforum.org/publications/the-global-competitiveness-report-2020/in-full/section-4-innovation-ecosystem/
8 https://www.shs-conferences.org/articles/shsconf/pdf/2017/07/shsconf_ies2017_01026.pdf

and globally connected. Bengaluru, often referred to as the "Silicon Valley of India," has long been at the forefront of this movement, hosting a vibrant mix of multinational corporations, homegrown tech giants, and ambitious startups. The launch of the Bengaluru Science and Technology (BeST) Cluster in 2022 marked a significant milestone, bringing together institutions like the Indian Institute of Science (IISc), Infosys, and other key stakeholders to foster collaborative, multidisciplinary research and address regional challenges with scalable solutions[9]. The BeST Cluster exemplifies the "ground-up pyramid model," which prioritizes sharing high-end laboratory resources, developing human capital, and leveraging local incubators and S&T councils to drive innovation that can be replicated nationally and globally. Across the country, similar clusters in Hyderabad, Pune, Delhi-NCR, Bhubaneswar, Jodhpur, and Vizag are each carving out unique niches—from biotech and medtech to clean energy and smart urban mobility—fueled by a shared mission to translate scientific breakthroughs into real-world impact[10].

The expansion of these innovation hubs is not only transforming their respective regions but also setting new benchmarks for problem-solving and sustainable development at the national level. In Hyderabad, for example, the Research and Innovation Circle of Hyderabad (RICH) has emerged as a powerhouse for health-tech and biotech innovation, supporting over 20 startups in diagnostics, genomics, and bioinformatics, several of which are advancing to clinical trials[11]. Meanwhile, Pune's Knowledge Cluster (PKC) is driving advancements in advanced manufacturing, materials science, and climate resilience, while Delhi's DRIIV cluster is pioneering EV charging infrastructure and digital transit solutions to decarbonize and streamline urban mobility. The collaborative, consortium-based model underpinning these clusters enables cross-sectoral partnerships between academia, industry, government, and startups, ensuring that research is demand-driven and solutions are scalable. Inter-cluster collaborations—such as joint projects between Delhi and Pune on AI for urban planning— further amplify the impact, allowing successful innovations to be replicated and adapted across regions4. The recent S&T Clusters Annual Report 2024–2025 highlights tangible outcomes, including AI-enabled e-waste management in Bengaluru, real-time water quality monitoring in peri-urban areas, and the development of indigenous medical devices at Vizag's AMTZ hub[12]. As these clusters mature, they are not only addressing local environmental, socioeconomic, and developmental challenges but also positioning India as a global leader in applied science and technology innovation.

9 https://www.indianweb2.com/2025/06/indias-sci-clusters-enter-phase-20.html
10 https://www.indianweb2.com/2025/06/indias-sci-clusters-enter-phase-20.html
11 https://www.mangalorean.com/indias-science-and-technology-clusters-to-boost-innovation-ecosystem-ajay-sood/
12 https://www.newkerala.com/news/o/indias-science-technology-clusters-boost-innovation-ecosystem-ajay-sood-453

Innovation Related Government Initiatives in India

1. ATAL INNOVATION MISSION (AIM)

Overview

Launched in 2016 under NITI Aayog, AIM is India's flagship program promoting innovation culture and entrepreneurship across schools, universities, industries, MSMEs, and communities.

Key Components

- **Atal Tinkering Labs (ATLs):** Creative maker-spaces in schools (Grades VI–XII), equipped with IoT devices, 3D printers, robotics kits, etc. As of 2025, ~10,000 labs across 722 districts, engaging over 11 million students.
- **Atal Incubation Centres (AICs):** Atal Incubation Centres (AICs), launched by the Atal Innovation Mission (AIM) in partnership with universities, institutions, and corporates, foster innovation and entrepreneurship among young Indian innovators. With 72 centres across the country, AICs provide startups with essential resources, including technical infrastructure, mentorship, funding, co-working spaces, and networking opportunities. Over 3,500 startups have been incubated, generating more than 32,000 jobs, with over 1,000 led by women founders. AICs support diverse sectors such as HealthTech, FinTech, EdTech, Space and Drone Technology, AR/VR, Food Processing, and Tourism, helping build scalable, sustainable, and impactful enterprises.
- **Atal Community Innovation Centres (ACICs):** To promote the benefits of technology led innovation to the unserved/underserved regions of India including Tier 2, Tier 3 cities, aspirational districts, tribal, hilly and coastal areas, AIM is setting up Atal Community Innovation Centres with a unique partnership driven model wherein AIM would grant upto Rs 2.5 crores to

an ACIC subject to a partner proving equal or greater matching funding. So far 14 ACICs have been established across the country.

- **Atal New India Challenges (ANIC):** Atal New India Challenge is a flagship program of Atal Innovation Mission, NITI Aayog. The program aims to seek, select, support and nurture technology-based innovations that solve sectoral challenges of national importance and societal relevance. ANIC solicits innovations in the prototype stage and supports the selected start-ups throughout the commercialization stage over the course of 12 – 18 months by funding up to INR 1 crore and other associated support. 53 Startups have been supported with grant-in-aid under ANIC phase 1, and 88 Startups have been shortlisted for grant-in- aid and mentorship support under ANIC phase 2 program.
- **Mentor India Campaign:** To enable all the initiatives to succeed AIM has launched one of the largest mentor engagement and management program "Mentor India – The Mentors of Change". Till date AIM has over 6200+ Mentors registered under the Programme.

AIM 2.0 (2024–28)

- Approved in Nov 2024 with ₹2,750 crore budget; goals include expanding labs (2,500 new in underserved regions), deep-tech commercialization sandboxes, vernacular innovation centres, industrial accelerators, sectoral launchpads, and global collaboration.

[Source: https://aim.gov.in/]

2. STAND-UP INDIA SCHEME

- **Launched:** April 5, 2016.
- **Purpose:** To encourage entrepreneurship among SC/ST and women by offering bank loans of ₹10 lakhs–₹1 crore for greenfield enterprises. It also aimed to break barriers by providing bank loans to help them start new businesses. Over the past 9 years, the scheme has not just funded

businesses—it has nurtured dreams, created livelihoods, and driven inclusive growth across India.

- **Impact:** The scheme reflected significant financial empowerment for the SC, ST communities and women entrepreneurs (from November 2018 to November 2024).

a) SC accounts grew from 9,399 to 46,248 with loan amounts rising from ₹ 1,826.21 crore to ₹ 9,747.11 crore.

b) ST accounts increased from 2,841 to 15,228 with sanctioned loans jumping from ₹ 574.65 crore to ₹ 3,244.07 crore.

c) Women entrepreneurs accounts grew from 55,644 to 1,90,844 with sanctioned amounts rising from ₹ 12,452.37 crore to ₹ 43,984.10 crore.

d) The Stand-Up India Scheme has shown remarkable growth over the years, with the total amount sanctioned increasing from Rs. 14,431.14 crore as of 31st October 2018 to an impressive Rs. 61,020.41 crore by 17th March 2025, since its launch. This reflects a substantial increase, highlighting the scheme's expanding impact in empowering entrepreneurs across the country.

[Source: https://www.pib.gov.in/PressReleasePage.aspx?PRID=2119045]

3. PUBLIC–PRIVATE INNOVATION PARTNERSHIPS (E.G. T-HUB, NSDC)

Public-private innovation partnerships, like T-Hub and NSDC, play a crucial role in fostering innovation and entrepreneurship. T-Hub, launched in 2015, is a collaboration between the Telangana state government, academia, and industry. NSDC, established in 2008, focuses on skill development to build a talent pool for innovation.

T-HUB:

- **Partners:** It was launched as a partnership between the Telangana state government, academia (including IIIT-Hyderabad, ISB, and NALSAR), and the private sector.
- **Focus:** T-Hub aims to accelerate the growth of startups by providing them with resources, mentorship, and access to investors and industry experts.
- **Phase II (2022):** Expanded its offerings to include Lab32 (a hardware innovation hub), T-Angel (an angel investing platform), and T-Bridge (a global market access program).
- **Recognition:** Recognized by the Department of Science & Technology (DST) and has received National Startup Awards.
- **Impact:** Has facilitated the growth of 2,000 startups and conducted over 100 innovation programs.

[Source: https://it.telangana.gov.in/initiatives/t-hub/]

NATIONAL SKILL DEVELOPMENT CORPORATION (NSDC):

- **Mission:** The National Skill Development Corporation (NSDC) is a not-for-profit public limited company focused on skill development and vocational training.
- **Objective:** To create a large pool of skilled manpower to meet the growing demands of various industries, including those driving innovation.
- **Approach:** Supports various skill development initiatives and works with training partners to deliver quality vocational training programs.
- **Impact:** Plays a vital role in building a skilled workforce that can contribute to the innovation ecosystem.

[Source: https://nsdcindia.org/innovation-engagement]

India's Growth and Innovation

India, with its rapidly evolving economy which is significantly influenced by innovation across various sectors, that underpins innovation in India and how they contribute to sustainable growth in future. India's growth with innovation are closely related which reflects India's dynamic economy and its potential to be a global leader.

Innovation is crucial especially for a developing country like India but the cost involved in innovation or financing innovation is critical for fostering new ideas and business models, but it does comes with several key challenges which are as follows:

- **High Risk and Uncertainty:** Innovation often involves unproven concepts leading to high level of uncertainty. Investors may be hesitant to fund new ideas that lack a clear path to success.
- **Lack of Track Record:** New innovative ideas often lack a proven track record, making it challenging to attract investment since the investors prefer to fund established and successful companies.
- **Long Time Horizons:** Many innovative projects require a long time to develop before they can generate returns. This can demotivate investors who are looking for quicker returns on their investment.
- **Regulatory Challenges:** Innovations, especially in sectors like healthcare and technology often face significant regulatory hurdles that can delay development and increase costs.
- **Economic Conditions:** Broader economic conditions can impact the availability of capital for innovation. During economic downturns, investors may become more conservative and less willing to fund projects having new ideas.
- **Market Acceptance:** Innovations must not only be technically sound but also accepted by the market. Investors may be concerned about whether there is a viable market for the innovation or not.
- **Access to Networks:** Successful innovation and its ideas often relies on access to networks of mentors, advisors, and other entrepreneurs. Lack of access to these networks can limit opportunities for securing funding and support.
- **Intellectual Property Issues:** Protecting intellectual property (IP) of innovation can be complex and expensive and therefore the investors may be careful if they believe that IP risks could undermine their investment.
- **Resource Constraints:** Many innovation projects require specialized knowledge and skills, which can be scarce and there can be constraint of right talent to drive innovation forward.

- **Cultural Barriers:** In some organizations, there may be a risk-averse culture that discourages innovative thinking and experimentation, making it harder to secure internal financing for new ideas.

Addressing these challenges requires a multifaceted approach, including fostering supportive ecosystems, building strong business cases, and creating policies that could encourage investment in innovation.

India has seen a growth in innovative startups over the years that have transformed various sectors through unique business models, technology, and a deep understanding of needs of a modern customer. Here are some notable case studies on innovative startups:

Sl. No.	Year	Founder	Innovative Startups
1	2007	Sachin Bansal and Binny Bansal	Flipkart
2	2008	Deepinder Goyal and Pankaj Chaddah	Zomato
3	2010	Bhavish Aggarwal and Ankit Bhati	Ola Cabs
4	2010	Vijay Shekhar Sharma	Paytm
5	2011	Byju Raveendran	Byju's

Source: Compilation by the authors

- **Byju's:** It is an online learning platform founded in 2011 that provides educational content for students from all age groups. It uses technology to create personalized learning experiences, making education more accessible and engaging.
- **Ola Cabs:** Founded in 2010 Ola revolutionized the transportation sector in India by providing a mobile app for booking taxis that disrupted the traditional taxi services. It has created numerous job opportunities for drivers and has empowered many Indians to earn a livelihood thus expanding its services to include bike taxis, auto-rickshaws and electric vehicles, catering to diverse customer groups.
- **Paytm:** Founded in 2010 Paytm started as a mobile wallet and has soon evolved into a comprehensive financial services platform that made revolution in digital payments platform. The platform has enabled millions of unbanked individuals to access financial services, including insurance and loans which has expanded into various sectors, including banking, e-commerce and ticket booking.
- **Flipkart:** It started as an online bookstore in 2007 and later expanded into a e-commerce platform becoming one of the largest e-commerce platforms in India with its own logistics and supply chain network, paving the way for the online shopping culture and customer satisfaction.

- **Zomato:** It started as a restaurant discovery platform in 2008 and evolved into a food delivery service transforming how people discover and order food, contributing to the rise of food delivery culture in urban India.

These case studies illustrate how Indian startups have leveraged technology and innovation to address local challenges while creating significant economic impact across various sectors.

Innovation has profoundly impacted both the infrastructure and manufacturing sectors, leading to increased efficiency, cost savings, improved sustainability, and enhanced quality of products and services. Here are some key impacts of innovation in these sectors:

Impact on Infrastructure

Internet of Things (IoT) has enabled the development of smart cities, where infrastructure such as roads, bridges, and public transport systems are equipped with sensors that monitor conditions in real-time. This leads to better traffic management, reduced congestion, and improved public safety. Advanced analytics and big data also allows urban planners to make informed decisions based on real-time data, improving resource allocation and urban development.

Innovations in materials and construction techniques, such as energy-efficient designs and sustainable materials, have led to the rise of green buildings that reduce environmental impact. Innovations in autonomous vehicle technology have also got the potential to transform public transportation systems and logistics, improving safety and efficiency. Recently, the use of 3D printing in construction also for rapid prototyping and the creation of complex structures with reduced waste in the infrastructure sector.

Impact on Manufacturing Sector

The adoption of robotics and automation technologies in manufacturing processes has led to increased productivity, reduced labor costs, and improved precision in production. Additive manufacturing allows for the production of complex parts with less material waste and shorter lead times. This technology is particularly beneficial for prototyping and customized products. Connected machines and IoT devices enable real-time monitoring and control of manufacturing processes, leading to greater efficiency and reduced downtime.

Innovations in recycling and waste management are helping manufacturers to adopt circular economy principles, where products are designed for reuse and recycling. Emerging innovations like machine learning algorithms can analyze production data to identify defects in real-time, ensuring higher quality products and reducing waste where data analytics and AI for predictive maintenance helps manufacturers anticipate equipment failures before they occur, minimizing downtime and maintenance costs.

Therefore, the impact of innovation on the infrastructure and manufacturing sectors is transformative, driving improvements across various dimensions such as efficiency, sustainability, quality, and responsiveness to market demands. As these sectors continue to evolve through technological advancements, they will likely play a crucial role in shaping economic growth and addressing global challenges such as climate change and urbanization.

The future outlook for India's growth and innovation is promising, driven by several key factors that position the country as a global leader in technology and entrepreneurship which is mainly characterized by a vibrant startup ecosystem, a focus on research and development, rapid digital transformation, a skilled workforce, public-private partnerships, sustainability initiatives, and global market integration. By applying these core areas, India is well positioned to emerge as a global leader in innovation and technology driven economic growth. However, challenges such as regulatory hurdles, infrastructure gaps, and the need for financing in education must be addressed to fully realize this potential.

Reference:

- https://fastercapital.com/topics/challenges-and-risks-associated-with-financial-innovation.
- https://growth91.com/blog/successful-startup-case-studies/
- https://manufacturing.economictimes.indiatimes.com/news/industry/union-budget-2025-paving-the-way-for-manufacturing-growth-msme-expansion-and-innovation/117934067
- https://manufacturing.economictimes.indiatimes.com/news/hi-tech/
- https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2073890
- https://www.tice.news/tice-dispatch/business-finance-economy-and-corporate-news/

Market Report: A Recap of the Key Developments for the month of March and April 2025

Significant Developments in Indian Stock Market: March-April 2025

Here's a comprehensive report on significant developments in the Indian stock market during **March and April 2025**, highlighting trends, regulatory updates, corporate activity, and investor behavior.

Market Performance & Investor Flows

- **Strong Q4-End Rally**: In March, the **BSE Sensex** and **Nifty 50** surged ~6–7%, marking a rebound from a weak start to the year. Sensex gained 6.3% in March, closing the fiscal year with a 5.3% upward move.
- **Foreign Investor Resurgence**: After months of net selling, **FPIs turned net buyers** during late-March, partially reversing earlier outflows.

Regulatory & Market Structure Updates

- **Derivatives Market Reforms**: On March 27, **SEBI proposed** limiting equity derivatives expiries to Tuesdays or Thursdays, reducing weekly options and extending minimum tenors to space out expirations.
- **Trading Holidays**: BSE and NSE were closed on **March 31** for Eid al-Fitr, followed by other public holidays in April, creating shorter trading windows.

Corporate & IPO Highlights

- **Promoter Confidence**: During March, promoters in **33 Nifty 500 companies** increased their stakes—reaching a six-quarter peak—as foreign investors pulled back.
- **IPO Pipeline Rebound**: By April, over **one million new investors** entered the market, and a dozen-plus companies lined up IPO launches over the next 3–6 months.

Sector & Company-Specific Movements

- **CDSL Stock Surge**: Central Depository Services (CDSL) recovered around 60% from March lows, reflecting restored confidence.
- **Ather Energy IPO Debut**: April saw a tepid IPO from **Ather Energy**, which fell ~4% on listing, highlighting caution around high-growth yet unprofitable sectors.

Macro & Market Drivers

- **Rural & Fiscal Uplift**: Boosted by government spending and rising rural demand, markets displayed resilience, as per Morgan Stanley's Gokul Laroia.
- **Geopolitical Impact**: Although India–Pakistan tensions flared late April, markets held steady, aided by strong earnings and corporate fundamentals.

Outlook & Market Anatomy

- **Record-Breaking Potential**: Despite valuation concerns, improved earnings, a favorable monsoon outlook, and easing geopolitical tensions point toward a potential all-time high year.
- **Cautious IPO Sentiment**: FPIs remain wary, focusing on valuations and volatility—potentially impacting near-term IPO performance.

Summary Table

Theme	March 2025	April 2025
Market Growth	Sensex/Nifty +6–7%; FPI reinvest	Nifty +5%; 1.01 million new investors
Regulatory Change	SEBI derivatives consultation	Market holiday pauses
Corporate Moves	Promoter stake increases, IPOs queued	Ather's muted debut
Sector Highlights	Recovery in CDSL	Renewed investor interest
Market Drivers	Rural demand, fiscal boost	Earnings reassurance, geopolitical stability
Outlook	Momentum recovery	Optimism with caution

Sector level Performance

Here's a comprehensive **sector-level performance breakdown** of the Indian stock market during **March and April 2025**:

Generic Indices Performance

All major broader indices recorded solid gains in both months, with mid- and small-caps outperforming in March and April

Sectoral Performance Snapshot

March 2025

- **Defence:** +24.75% — the standout performer underpinned by robust government spending.
- **PSEs:** +16.03% — gains driven by fiscal stimulus expectations.
- **Energy & Commodities:** +11–12% — commodity markets rallied amid rural demand and global tailwinds.
- **Railways & Capital Markets:** +10–11% — infrastructure-linked themes saw strong inflows.
- **REITs:** –1.1% — the only sector with negative momentum.

April 2025

- **Defence:** +11.51% — reinforced by renewed order inflows and geopolitical confidence.
- **Capital Markets:** +9.37% — buoyed by increased deal activity.
- **Transport & Logistics, SME:** among top performers, supported by trade and domestic growth.
- **Banking:** +6.83% — led sectoral gains, driven by strong inflows and earnings.
- **Oil & Gas, FMCG, Auto, PSU Bank, Consumer Durables, Realty:** all logged +4–6% returns.

Sectoral Trends & Drivers

- **Metals (Nifty Metal):** Notable profit growth over recent quarters, led by steel, supported by cost efficiency and infrastructure demand.
- **FMCG:** Despite short-term pressure from unseasonal rains, the sector remains strong long-term, bolstered by rural demand and premiumisation.
- **Pharma:** Continued healthy growth in April (+7.8% annual sales increase), aided by price strategies.
- **Banking & Financials:** Mixed Q4—banking impacted but financial services saw recovery in April with strong FPI flows (₹184B).
- **IT Sector:** Weakest performance trend in March—+3.2% fall in March, outflows continued into April due to global headwinds.

Foreign Capital Flows & Impacts

- **March:** FPIs sold ~USD 3.5B overall, particularly from **IT and Consumer sectors**, adding pressure on valuations.
- **April:** Dramatic reversal—massive inflows into **Financials, Consumer, and Telecom**, with FPIs net-buying ₹184B in financials alone.

Summary Table

Sector	March Return	April Return	Key Drivers
Defence	+24.8%	+11.5%	Govt spending, orders
PSEs	+16.0%	–	Public sector revival
Capital Markets	+10.5%	+9.4%	Deal activity, structuring
Energy & Commodities	+11–12%	–	Rural demand, input bounce
Banking & Financials	~+10%	+6.8%	Earnings, FII inflows
Oil & Gas	–	+4–6%	Global price support
FMCG	~+1–2%	+4–6%	Rural boost, easing rains
Auto	~0.2%	+4–6%	Demand recovery
Realty	–5.2%	+4–6%	Rate cuts, policy support
Pharma	+?	+7.8%	Price improvements
IT	–3.2%	-2.1% outflows	US slowdown fears, tariffs

Insights for Investors

1. **Diversify into cyclical leaders:** Defence, energy, metals, and PSEs showed strong March–April gains.
2. **Focus on stability:** Banking and financials rebounded in April, backed by earnings and FII support.
3. **Caution in growth sectors:** IT remains under pressure; outflows and global uncertainties require careful evaluation.

4. **Consumer resilience:** FMCG's long-term fundamentals remain strong despite weather-induced disruptions.

Global Economic Factors Influencing Indian Markets (March–April 2025)

1. **US Federal Reserve Policy Uncertainty**
   - Throughout March and early April, investors globally were cautious due to **mixed signals from the US Fed** regarding rate cuts.
   - Persistent inflation in the US caused delays in expected monetary easing.
   - This led to volatility in global capital flows, with **Foreign Portfolio Investors (FPIs) withdrawing over USD 3.5 billion from Indian markets in March**, particularly from rate-sensitive sectors like IT and Consumer.
2. **Geopolitical Tensions**
   - **Middle East conflicts** and renewed **Russia–Ukraine hostilities** in early April spooked global risk sentiment.
   - Crude oil prices saw temporary spikes above **$90/barrel**, pressuring India's import bill and inflation expectations.
   - However, India remained relatively resilient due to strategic reserves and stable currency management.
3. **China's Slowdown & Stimulus Measures**
   - Weak manufacturing and export data from China in March raised concerns about global demand recovery.
   - By April, China announced **new fiscal stimulus**, which buoyed metals and commodity-linked sectors worldwide—including Indian steel and capital goods stocks.
4. **Global Commodity Rebound**
   - Following soft trends in early Q1, **global commodity prices (especially base metals and oil)** rebounded in March-April.
   - This benefited Indian **PSUs, energy, and capital goods sectors**, which were among the top performers in both months.
5. **Rupee Stability & Currency Movements**
   - Despite global headwinds, the **Indian Rupee remained stable** against the US dollar, supported by:
     - Strong forex reserves
     - Lower-than-expected trade deficit
     - Softening US dollar index post-April
   - This gave FPIs confidence to re-enter Indian markets in April, particularly in banking and telecom.

6. Global Equity Trends

- US and European indices ended April on a slightly higher note, driven by strong tech earnings.
- **Emerging market ETFs** saw net inflows in late April, signaling renewed appetite for risk—benefiting India alongside peers like Brazil and Indonesia.

Summary Table

Factor	Impact on India	Sectors Most Affected
US Fed rate delay	FPI outflows in March	IT, Consumer
Oil price spike	Marginal inflation pressure	Oil & Gas, Auto
China slowdown & stimulus	Mixed global cues → rebound	Metals, Capital Goods
Global commodity rally	Boosted cyclical sectors	Energy, Infrastructure
Rupee stability	Encouraged April FPI return	Banking, Telecom
Risk-on sentiment late April	Positive for equities	Midcaps, Capital Markets

Conclusion

The Indian market in March and April 2025 navigated **significant global volatility**, but domestic macro stability and sector-specific momentum helped it outperform. While global cues caused **short-term outflows**, **strong fundamentals, earnings, and resilient currency** attracted investors back by late April.

Significant developments involving the Reserve Bank of India (RBI) during March and April 2025:

1. Key Policy Rate Cuts

April 2025 Repo Rate Adjustment

- In its April Monetary Policy Committee (MPC) meeting, RBI cut the **repo rate by 25 bps**, from 6.25% to **6.00%**, and shifted its stance from *neutral* to *accommodative* to support economic growth.

June Preparatory Steps

- The significant **50 bps cut in early June (to 5.50%)** was prefaced by a series of easing moves—25 bps in February and April—totaling **100 bps of monetary loosening** in 2025.

2. Liquidity Management & CRR Reduction

- RBI reduced the **Cash Reserve Ratio (CRR) by 100 bps** to **3%**, releasing approximately ₹2.5 trn into banking system liquidity.
- The RBI aimed to maintain a **liquidity surplus around 1% of deposits (~₹2 trn)** by injecting over ₹5.4 trn via OMOs and forex swaps, and planned another ₹400 bn injection via bond purchases in April.

3. Transmission to Lending & Deposit Rates

- Public and private banks swiftly passed on rate cuts:
  - **Lending rates down**: Bank of Baroda reduced home loan rates to 8.15%; other PSU banks followed.
  - **FD drops**: Fixed Deposit rates slid by 30–70 bps since February, affecting savers.

4. **Macroeconomic Outlook**
   - RBI projected **FY26 inflation at ~3.7%** (down from 4%), signaling easing price pressures.
   - GDP growth forecast was robust at **6.5%** for FY26.
   - The MPC shifted from "accommodative" to "neutral," indicating the belief that **monetary easing had become sufficient** despite remaining flexible.
5. **Regulatory & Technical Measures**
   - RBI responded to banking-sector feedback by planning a transition from **2-week variable-rate repo** to an **overnight rate framework**, alongside potential adoption of **SORR** as a benchmark and further CRR easing.
   - Rule revisions also targeted **small-ticket gold-loan lending**, easing appraisal norms and raising maximum LTV to **85%**, aimed at boosting financial inclusion.
6. **Broader Impacts & Implications**
   - **Credit growth expected to rise** due to ample liquidity, low policy rates, and enhanced bank lending capacity.
   - **Bond yields flattened**, with shorter-term yields dropping while the 10-year benchmark held stable around 6.24%.
   - **Deposit and home loan costs dropped**, saving consumers up to ₹7.7 lakh over a 20-year home loan term.

Summary Table

Area	Key Developments
Policy Rates	Repo reduced by 25 bps (April) + 50 bps later; cumulative 100 bps easing
Liquidity	CRR cut by 100 bps; ₹2–2.5 trn added to bank reserves; surplus maintained
Lending & Deposit Rates	Home loan rates decreased; FD rates cut by 30–70 bps
Macroeconomic Outlook	Inflation forecast 3.7%; GDP growth at 6.5%; stance shifted to neutral
Technical Refresh	Movement to overnight rate, SORR switch; gold-loan rule easing
Market Impacts	Bond yield shift; deposit & lending cost relief; broad economic stimulus

Conclusion

During March–April 2025, the RBI took **bold and coordinated actions**—slashing both repo rate and CRR, managing liquidity, and refreshing technical frameworks—to rejuvenate credit growth while keeping inflation in check. These efforts are expected to **extend economic growth momentum into FY26**, benefiting borrowers, banks, and capital markets.

MEMBERS IN INDUSTRY & PSUs COMMITTEE 2024-2025

CMA Bibhuti Bhusan Nayak — President
CMA T.C.A. Srinivasa Prasad — Vice President

Chairman
CMA Avijit Goswami

Members

CMA Manoj Kumar Anand
CMA Navneet Kumar Jain
CMA Chittaranjan Chattopadhyay
CMA Vinayaranjan P.
CMA Suresh Rachappa Gunjalli
CMA Ashwin G. Dalwadi
CMA Gagan Bihari Swain, Co-opted
CMA Aleti Jammaya, Co-opted
CMA Prasanna Kumar Acharya, Co-opted

Secretary – MII Committee; Editor – Industry Insights
CMA (Dr.) D.P. Nandy, Secretary (Officiating)

CMA Ria Chowdhury, Deputy Director

OUR CONTRIBUTORS IN THIS ISSUE

Dr. Ashish Kumar Sana
Professor & Former Head
Department of Commerce
University of Calcutta, Kolkata

CMA (Dr.) Arindam Banerjee
Associate Professor
Shiv Nadar University, Chennai

Dr. Bappaditya Biswas
Assistant Professor
Department of Commerce
University of Calcutta, Kolkata

Dr. Biswajit Paul
Assistant Professor
PG & Research Department of Commerce
University of Gour Banga, Malda

Richa Gupta
Faculty of Commerce
Andhra Education Society N.T. Rama Rao Memorial
Senior Secondary School, Janakpuri

CMA Agnishwar Mukherjee
Additional Treasury Officer
WBA&AS, Finance Department Govt. of West Bengal

Dr. Satya Kishan
Associate Professor,
MATS School of Business Studies,
MATS University, Raipur

CMA Sandip Basak
Assistant Professor
Department of Commerce
Dwijendralal College

Mr. Debasish Naskar
Assistant Professor
Department of Commerce,
Raja Peary Mohan College, Hooghly

Mr. Priyajit Kumar Ghosh
Assistant Professor
Department of Commerce (Morning)
St. Xavier's College (Autonomous), Kolkata

Mr. Rohan Prasad Gupta
Research Scholar (SRF)
Department of Commerce
University of Calcutta, Kolkata

Mr. Priyajit Ray
Assistant Professor
Department of Commerce
Raja Peary Mohan College

Mr. Mantosh Sharma
Assistant Professor
Department of Commerce
Raja Rammohun Roy Mahavidyalaya

Ms. Sailza Sharma
Research Scholar
Department of Commerce
University of Kalyani

Ms. Moumita Acharya
College Whole Time Teacher
BBA Department
The Bhawanipur Education Society College

Mr. Aditya Sarkar
Research Scholar
Department of Commerce
University of Calcutta

THE INSTITUTE OF COST ACCOUNTANTS OF INDIA

(Statutory Body under an Act of Parliament)

www.icmai.in

mii-psu@icmai.in

Headquarters:
CMA Bhawan, 3, Institutional Area, Lodhi Road, New Delhi-110003

Kolkata Office:
CMA Bhawan, 12 Sudder Street, Kolkata-700016

Behind every successful business decision, there is always a CMA