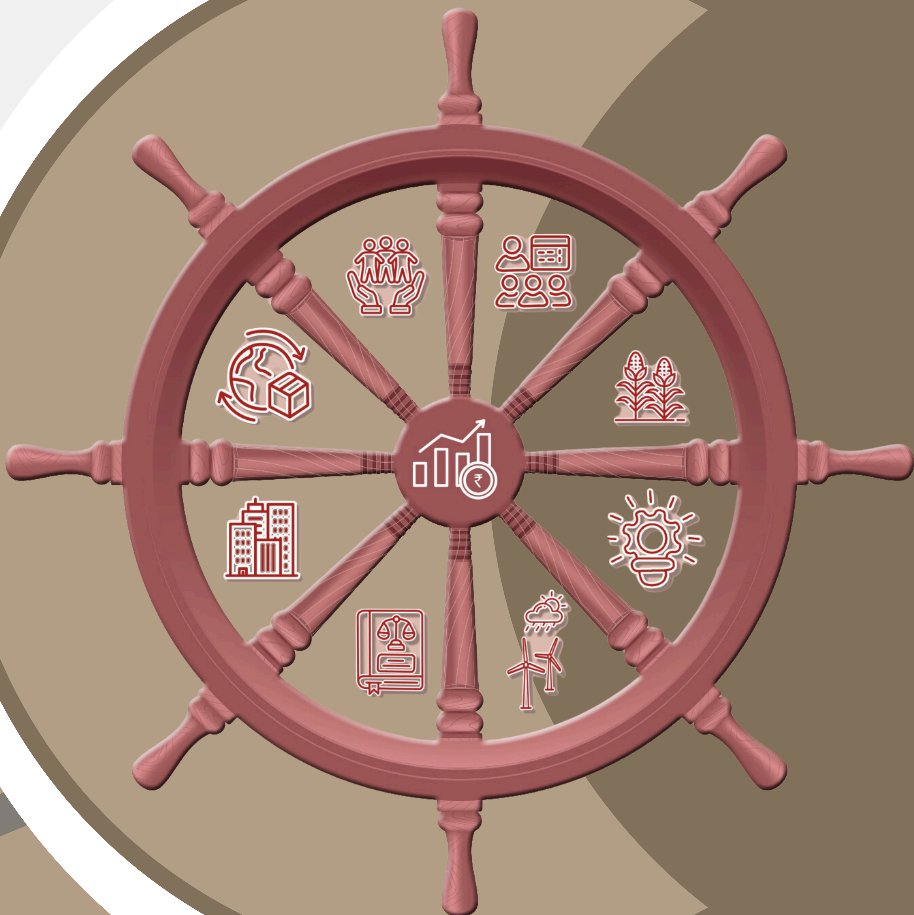
NATIONAL ECONOMIC FORUM

ECONOMIC SURVEY

2024-25

AN ANALYSIS



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STATE OF THE ECONOMY:
GETTING BACK INTO THE FAST LANE

India's economy continues to chart a growth trajectory despite global turbulence, with an estimated real GDP growth of 6.4% in FY25. This growth is backed by a strong services sector, resilient private consumption, and an agricultural rebound. However, not all is smooth sailing - external risks, manufacturing sluggishness, and financial sector concerns cast shadows on an otherwise optimistic picture. The key takeaway is that while India remains one of the fastest-growing major economies, it cannot afford complacency.

Macroeconomic Stability and Growth Prospects

- **GDP Growth**: A projected 6.4% real GDP expansion signals steady economic momentum, but it falls short of India's aspirational 7-8% growth necessary to unlock its full potential.
- **Resilient Private Consumption**: Domestic demand remains a crucial pillar of growth, bolstered by record Kharif production and increasing formal employment.
- **Manufacturing Weakness**: While the services sector thrives, the manufacturing sector faces challenges due to weak global demand and trade uncertainties.
- **External Risks Loom Large**: Geopolitical tensions, commodity price fluctuations, and fragile global trade growth pose threats to India's outlook.

Global Economic Landscape

The global economy trudged forward with a modest 3.3% growth in 2023, with forecasts of 3.2% and 3.3% for 2024 and 2025, respectively. While advanced economies like the U.S. maintained stability, the Eurozone and China struggled. India's divergence from sluggish global growth remains commendable but requires vigilance against external shocks.

- **Geopolitical Disruptions**: Conflicts such as the Russia-Ukraine war and tensions in the Middle East have fuelled inflation and energy supply shocks.
- **Monetary Policy Shifts**: The global monetary tightening cycle is easing, with central banks cutting interest rates to support growth. India's RBI remains cautious, prioritising inflation control.
- **Trade Volatility**: Global trade has suffered from shipping disruptions, protectionist measures, and subdued demand from major economies.

Sectoral Performance: The Good, the Bad, and the Ugly

<u>Agriculture: A Silver Lining Amidst Global Volatility</u>

India's agricultural sector has rebounded impressively, with record Kharif food grain production of 1647.05 LMT, 5.7% higher than the previous year. This, combined with a stable monsoon and improved reservoir levels, should ease food inflation concerns. However, structural issues like low farmer incomes and climate risks remain unresolved.

Manufacturing: A Sector in Distress

While India's Manufacturing PMI remains in expansion mode, industrial growth slowed to 6% in H1 FY25 due to weak external demand and temporary seasonal factors. The government's capital expenditure push should revive momentum, but long-term competitiveness hinges on boosting productivity and reducing logistical inefficiencies.

Services: The Growth Engine Continues to Fire

The services sector remains India's economic backbone, growing at an impressive 7.2%. High-frequency indicators like PMI services, air cargo growth, and IT sector performance reaffirm its dominance. However, India must ensure this growth translates into widespread employment opportunities.

Inflation and Financial Sector Health

- **Inflationary Trends**: Headline inflation has cooled from 5.4% to 4.9%, but food inflation remains a pain point, rising to 8.4% due to supply disruptions. The RBI's tight monetary stance has helped, but any global commodity price surge could reverse the gains.
- **Banking Sector Resilience**: India's banks remain well-capitalised, with NPAs at a 12-year low (2.6%) and a strong capital-to-risk-weighted assets ratio (16.7%). However, the mismatch between credit and deposit growth, coupled with rising unsecured retail loans, poses medium-term risks.

Employment and Formalisation: Encouraging but Incomplete

India's formal employment landscape has improved significantly, with the unemployment rate falling to 3.2% (from 6% in 2017-18) and net EPFO additions reaching record levels. However, informal employment remains high, and labour force participation rates need further improvement. Youth-driven job additions indicate a promising future, but quality job creation remains a challenge.

WAY FORWARD

Short-Term Priorities

1. **Manufacturing Revival**: Targeted interventions, such as production-linked incentives (PLIs) and infrastructure investment, must address sectoral weaknesses.
2. Infl**ation Management**: While inflation is under control, food price volatility must be tackled through supply chain improvements and strategic reserves.
3. **Credit Growth vs. Stability**: The RBI must balance supporting economic growth with financial sector prudence, particularly regarding unsecured lending.

Long-Term Imperatives

1. **Sustained Infrastructure Investment:** Public and private investments in roads, railways, and digital infrastructure will be key to sustaining high growth rates.
2. **Export Competitiveness:** India must focus on trade diversification, higher value-added manufacturing, and reducing dependence on a few key markets.
3. **Structural Reforms:** Labor market flexibility, land acquisition simplifications, and judicial efficiency are essential for improving the ease of doing business.
4. **Climate Resilience:** The economic survey highlights India's agricultural success, but climate change poses a long-term threat. Sustainable farming practices and water management must be prioritised.

The Economic Survey 2024-25 presents a story of resilience, yet underlying vulnerabilities persist. While India's growth trajectory is among the strongest globally, complacency is not an option. External uncertainties, financial sector imbalances, and industrial stagnation require proactive policy responses. India's economic policymakers must ensure that growth remains inclusive, sustainable, and resilient in the face of global headwinds. If managed well, India is poised to cement its status as the fastest-growing major economy, but structural reforms will determine whether this growth is truly transformative.

FINANCIAL & MONETARY SECTOR DEVELOPMENTS:

THE CART AND THE HORSE

Monetary Developments

- **Monetary Policy Stance**: The RBI maintained the policy repo rate at 6.5% during FY25, shifting from a “withdrawal of accommodation” stance to a “neutral” stance in October 2024 to balance inflation and growth.
- **Liquidity Measures**: The RBI reduced the Cash Reserve Ratio (CRR) to 4% in December 2024, infusing ₹1.16 lakh crore into the banking system.
- **Money Supply Trends**:
    - **M0 (Reserve Money):** Grew by 3.6% YoY as of January 2025, down from 6.3% a year ago.
    - **M3 (Broad Money):** Grew by 9.3% YoY (excluding the impact of a non-bank merger), with aggregate deposits being the largest contributor.
    - **Money Multiplier (MM):** Increased to 5.7 in December 2024, indicating higher liquidity generation in the economy.

Financial Intermediation

- **Banking Sector Performance**:
    - **Asset Quality**: Gross Non-Performing Assets (GNPAs) of Scheduled Commercial Banks (SCBs) declined to a 12-year low of 2.6% in September 2024.
    - **Capital Adequacy**: The Capital-to-Risk Weighted Assets Ratio (CRAR) stood at 16.7%, well above the regulatory requirement of 8%.
    - **Profitability**: Profit After Tax (PAT) surged by 22.2% YoY in H1 FY25, with Return on Assets (RoA) and Return on Equity (RoE) improving.
    - **Provision Coverage Ratio**: Increased to 77% in September 2024, up from 74.9% in March 2023.

Credit Growth

- Overall bank credit growth moderated to 11.8% YoY in November 2024, down from 15.2% a year ago.
- **Sector-wise credit growth**:
    - **Agriculture**: 5.1%
    - **Industry**: 4.4% (MSMEs grew at 13%, while large enterprises grew at 6.1%).
    - **Services**: 5.9%
    - **Personal Loans**: 8.8%
- **Credit/GDP Ratio:** The credit-to-GDP gap narrowed to (-)0.3% in Q1 FY25 from (-)10.3% in Q1 FY23, indicating sustainable credit growth.

Rural Financial Institutions (RFIs)

- **Regional Rural Banks (RRBs):**
  - Consolidated net profit increased from ₹4,974 crore in FY23 to ₹7,571 crore in FY24.
  - CRAR rose to 14.2% in FY24, with number of loss-making RRBs decreasing from 6 to 3.
  - **GNPA Ratio**: Improved to 6.1% in FY24, the lowest in a decade.

Development Financial Institutions (DFIs)

- **Infrastructure Financing**:
  - **Indian Infrastructure Finance Company Limited (IIFCL)**: Approved co-financing for over 780 projects with a total outlay of ₹13.9 lakh crore.
  - **National Bank for Financing Infrastructure and Development (NaBFID)**: Sanctioned ₹1.3 lakh crore in loans by September 2024, targeting ₹3 lakh crore by FY26.

Capital Markets

- **Primary Markets**:
  - **IPO Boom**: The number of IPOs increased sixfold between FY13 and FY24, with India ranking first globally in IPO listings in FY24.
  - **Resource Mobilisation**: ₹11.1 lakh crore raised from April to December 2024, a 5% increase over FY24.

- **Secondary Markets**:
  - **Nifty 50**: Delivered a return of 4.6% from April to December 2024, despite geopolitical uncertainties.
  - **Market Capitalisation**: BSE-listed stocks crossed USD 5 trillion in May 2024, with market cap-to-GDP ratio reaching 136% in December 2024.

- **Investor Participation**:
  - **Demat Accounts:** Increased by 33% YoY to 18.5 crore in December 2024.
  - **Mutual Funds**: Assets Under Management (AuM) rose to ₹66.9 lakh crore, with 10 crore SIP accounts contributing ₹10.9 lakh crore since inception.

Insurance Sector

- **Growth**:
  - Total insurance premium grew by 7.7% in FY24, reaching ₹11.2 lakh crore.
  - **Insurance Penetration**: Declined slightly to 3.7% in FY24, below the global avg. of 7%.
  - **Life Insurance**: Premium income grew by 6.1%, with 54.4% from renewal premiums.
  - **Non-Life Insurance**: Gross direct premium grew by 7.7%, driven by health and motor segments.

Pension Sector

- **National Pension System (NPS)**:
  - Total subscribers reached 783.4 lakh in September 2024, a 16% YoY growth.
  - **Atal Pension Yojana (APY)**: Subscribers increased to 629.1 lakh, with 52% female participation.
  - **Unified Pension Scheme (UPS)**: Approved in August 2024, offering a guaranteed pension of 50% of the last drawn salary for government employees.

Financial Sector Regulators

- **Regulatory Framework**:
  - The RBI, SEBI, IRDAI, and PFRDA play key roles in maintaining financial stability.
  - **Regulatory Impact Assessment (RIA)**: Suggested for improving the quality of regulations and reducing compliance burdens.

Cybersecurity in the Financial Sector

- **Cyber Threats**:
  - Financial institutions remain vulnerable to phishing, ransomware, and DDoS attacks.
  - **CERT-In**: Handled 13.9 lakh cybersecurity incidents in 2022.
  - **Global Cybersecurity Index (GCI)**: India ranked Tier 1 with a score of 98.49/100 in 2024.

Risks

- **Emerging Risks**:
  - **Financialisation:** Excessive growth of financial markets could lead to systemic risks, as seen in advanced economies.
  - **Consumer Credit**: Share of consumer credit in total bank credit increased from 18.3% in FY14 to 32.4% in FY24.
  - **Non-Bank Financing**: Bank's share in total credit declined from 77% in FY11 to 58% in FY22, with a rise in NBFCs and bond market financing.

Outlook

- **Future Outlook**:
  - The financial sector is poised for growth, driven by strong macroeconomic fundamentals, digital transformation, and increased investor participation.
  - Regulatory measures must balance financial resilience and growth to avoid over-financialisation.

EXTERNAL SECTOR:

GETTING FDI RIGHT

The Economic Survey 2024-25 delivers a panoramic overview of the prevailing geopolitical and economic uncertainties that have shaped global trade and investment flows. It highlights geoeconomic fragmentation, rising protectionism, and supply chain realignments, underlining their implications for India's external sector.

The Survey draws emphasis on the ongoing volatility; the Global Economic Policy Uncertainty (GEPU) Index remains elevated, driven by heightened trade tensions among major economies. The Trade Policy Uncertainty (TPU) Index has surged since December 2023, indicating a precarious investment climate. However, the Survey does not sufficiently interrogate how India's specific trade agreements or geopolitical positioning mitigate or exacerbate these challenges. A comparative analysis with Vietnam, Indonesia, and Mexico - nations also vying for FDI amidst similar global conditions - would have provided greater insight.

Between April and December 2024, India's total exports (merchandise + services) reached US $602.6 billion, reflecting a 6% year-on-year (YoY) growth. Notably, non-petroleum, non-gems & jewellery exports rose by 10.4%, signaling diversification in the export basket. Conversely, total imports reached US $682.2 billion, expanding by 6.9%, largely driven by high domestic demand for capital goods, electronic components, and energy products.

While the report lauds India's trade resilience, it sidesteps key structural issues:

- Merchandise exports grew at a mere 1.6%, significantly trailing behind the global trade recovery (3.3% YoY).
- The trade deficit widened to US $79.5 billion - a trend exacerbated by persistent reliance on imported capital goods and electronics.
- The services sector outperformed merchandise trade, with net services receipts increasing from US $120.1 billion (April-Dec 2023) to US $131.3 billion (April-Dec 2024). This highlights India's increasing reliance on IT and business services exports (10.2% of global share, second only to the US).

Albeit, the report fails to explore whether India's services export growth is sustainable amidst intensifying global competition from emerging tech hubs like Poland, the Philippines, and Eastern Europe.

Gross FDI inflows saw a revival in FY25, but net FDI inflows declined compared to April-November 2023, driven by rising repatriation and disinvestment. India's FDI-to-GDP ratio remains below 2%, lagging behind competitors like Vietnam (6.2%) and Indonesia (5.7%).

Investment repatriation increased, but the Survey does not dissect whether regulatory burdens, policy unpredictability, or global monetary tightening are responsible.

The Survey asserts that macroeconomic stability supports FPI inflows, yet it fails to address the risks posed by hot money flows, which increase vulnerability to external shocks.

While India's US $640.3 billion forex reserves (December 2024) cover 90% of external debt, this measure is not a panacea against volatility. With 42% of India's external debt being short-term, rollover risks remain significant. A deeper examination of the maturity structure of external debt and the nature of FDI flows (greenfield vs. brownfield investments) would provide a more holistic risk assessment.

The Survey rightly highlights a shift toward "friendshoring" and "nearshoring", where countries prioritise trade with geopolitical allies. This shift is evident in:

- Russia and China reducing trade dependence on the EU and the US.
- Vietnam and Russia increasing trade dependency on China.
- 26,000 new trade restrictions globally (2020-2024), covering 70% of global trade (as per UNCTAD data).

The Survey does lack an empirical assessment of whether India’s policy stance aligns with the following major shifts:

- Does India's recent FTA strategy (e.g., India-UAE CEPA) effectively counterbalance Western protectionism?
- Are Indian firms equipped to navigate Non-Tariff Measures (NTMs), especially carbon-related trade barriers such as the EU’s Carbon Border Adjustment Mechanism (CBAM) and the European Union Deforestation Regulation (EUDR)?

The Survey does acknowledge that India’s CBAM-exposed exports to the EU rose from 6.3% (2014) to 10.5% (2023), indicating potential vulnerabilities. Indian iron & steel exports to the EU alone rose from US $2.96 billion (2014) to US $5.55 billion (2023), making them highly susceptible to CBAM levies.

Suggested Policy Recommendations for the aforementioned shifts:

1. Establishing a domestic carbon trading mechanism to mitigate the impact of CBAM.
2. Enhancing traceability and sustainability in agri-exports to meet EUDR compliance.
3. Negotiating Mutual Recognition Agreements (MRAs) to align certification standards with key trading partners.

India’s average tariff rate declined from 48.9% (2000) to 17.3% (2024). However, tariffs on capital goods and electronics remain high, raising input costs and discouraging technology transfer.

The Survey argues that "calibrated tariffs" support industrial policy, citing historical precedents like Korea’s targeted tariff interventions in the 1970s. However, it does not assess:

- Whether India’s current tariffs effectively nurture high-tech domestic manufacturing; or
- If import substitution strategies in electronics and semiconductors enhance competitiveness or merely raise consumer costs.

Non-Tariff Measures (NTMs) now impact 67% of global trade. Technical Barriers to Trade (TBTs) affect 31.6% of product lines.Interestingly, NTMs positively correlate with FDI inflows, as firms seek local production avenues to bypass regulatory barriers. A 12% rise in FDI was observed when NTMs increased from 2.5 to 3.5 per product (as per UNCTAD data). However, India’s NTM framework lacks strategic coherence. Instead of adopting retaliatory NTMs, India should leverage trade diplomacy to negotiate exemptions for its industries.

India's B2C e-commerce exports reached US $4-5 billion in FY23, projected to hit US $200-300 billion by 2030. However, India accounts for just 1.5% of global e-commerce trade, projected to remain below 2%.

The Survey lays stress on GST rebates and e-commerce export hubs, but it neglects:

- High logistics costs, which are 2-3x those in China.
- Regulatory ambiguity on cross-border e-payments, affecting MSMEs.
- Stringent compliance burdens, making India’s export procedures more cumbersome than ASEAN peers.

In-toto, the Economic Survey 2024-25 presented a robust data-driven narrative but lacked sufficient comparative benchmarking. While it did celebrate India’s export diversification and forex resilience, it downplayed:

- FDI stagnation and rising repatriation risks.
- Merchandise trade vulnerability amidst shifting global supply chains.
- The strategic importance of aligning India’s trade policies with emerging geopolitical blocs.

Ergo, any future policy considerations ought to prioritise:

1. Reducing the cost of capital for exporters through trade finance reforms.
2. Negotiating favourable trade terms in FTAs with EU, UK, and Indo-Pacific markets.
3. Enhancing MSME participation in global e-commerce supply chains.

One can reiterate numerous times that there remains the continued necessity of a more dynamic and agile external sector strategy for India in an era of geoeconomic turbulence.

PRICES AND INFLATION:
UNDERSTANDING THE DYNAMICS

Inflation remains a critical indicator of economic health, influencing both policy decisions and household budgets. In recent years, global inflation peaked in 2022 due to supply chain disruptions and geopolitical tensions but has since moderated, aided by synchronised monetary policy tightening. In India, retail inflation eased in FY25, driven by a decline in core inflation and government interventions, though food inflation, particularly for vegetables and pulses, remained a challenge. Extreme weather events, such as heatwaves and unseasonal rainfall, have exacerbated price volatility, especially for perishable items like tomatoes and onions.

Global Inflation Trends

- **Global Inflation Peaked in 2022**: Inflation reached 8.7% in 2022 due to supply chain disruptions and geopolitical tensions but declined to 5.7% in 2024.
- **Resilience Amid Tightening Policies**: Despite synchronised monetary policy tightening, global output growth remained resilient, leading to a steady decline in headline inflation.
- **Core Inflation Decline**: Core inflation (excluding food and energy) also decreased, driven by moderation in international commodity prices.
- **Global Food Inflation Eases**: Food inflation declined globally due to improved supply conditions, though some emerging economies like India, Brazil, and China experienced diverging trends.

Domestic Inflation in India

- **Retail Inflation Moderates:** India's retail inflation eased from 5.4% in FY24 to 4.9% in FY25 (April-December), driven by a decline in core inflation and fuel prices.
- **Food Inflation Pressures:** Food inflation remained firm, primarily driven by vegetables and pulses, which contributed significantly to overall inflation.
- **Vegetable Price Volatility:** Extreme weather conditions, such as heatwaves and unseasonal rainfall, disrupted vegetable production, leading to price spikes in tomatoes and onions.
- **Core Inflation Decline:** Core inflation dropped by 0.9 percentage points between FY24 and FY25, with core services inflation declining more than core goods inflation.

Impact of Weather on Vegetable Prices

- **Extreme Weather Events**: The frequency of extreme weather events, such as heatwaves and unseasonal rainfall, increased, impacting vegetable production and prices.
- **Crop Damage**: Crop area damaged due to weather conditions rose in 2024, further worsening supply chain disruptions and price volatility.
- **Correlation with Inflation:** A positive correlation was observed between extreme weather events and vegetable inflation, with price impacts lasting up to three months after the events.

Onion and Tomato Production and Prices

- **Onion Production Decline:** Onion production decreased in 2022-23 and 2023-24 (from 30.2 million tonnes in 2022-23 to 24.3 MT in 2023-24), leading to inflationary pressures in FY24 and FY25.
- **Tomato Price Volatility:** Tomato prices remained high due to supply constraints, short crop cycles, and perishability, with production concentrated in a few states.
- **Seasonal Production Challenges:** Both onion and tomato prices are influenced by seasonal production patterns, with lean seasons leading to price spikes.

Pulses and Tur Inflation

- **Tur Production Decline:** Tur production declined by 13% in 2022-23 and 10.8% in 2023-24, leading to high price pressures in FY24 and FY25.
- **Negative Correlation:** There is a strong negative correlation between tur production and inflation, with lower production in one year leading to higher inflation the following year.
- **Government Measures:** The government implemented measures such as stock limits, imports, and monitoring to stabilise tur prices.

Administrative Measures to Control Inflation

- **Cereals and Pulses**: The government imposed stock limits, offloaded stocks through open market sales, and allowed duty-free imports of pulses.
- **Vegetables**: Measures included buffer stocking of onions, subsidised sales, and export duties to stabilise prices.
- **Monitoring and Control**: The government actively monitored stocks and prices to prevent hoarding and ensure adequate supply.

The Reserve Bank of India (RBI) and the International Monetary Fund (IMF) project that India's inflation will progressively align with the target in FY26, with headline inflation expected to stabilize around 4.2%. This optimistic outlook is supported by the anticipated decline in global commodity prices, which is likely to ease domestic inflationary pressures, particularly in key sectors such as energy and food. Additionally, a normal monsoon in 2024 has significantly improved water reservoir levels, bolstering agricultural production and potentially mitigating food inflation in the coming months. However, to ensure long-term price stability, structural measures are essential. These include developing climate-resilient crop varieties to withstand extreme weather events, expanding pulse cultivation in rice-fallow regions to address supply-demand gaps, and enhancing data systems for real-time price monitoring. Promoting best agricultural practices through farmer training and the adoption of high-yield, disease-resistant seeds will also be crucial in reducing crop damage and improving yields. While these measures offer a promising path forward, their success will depend on effective implementation and sustained policy support to address the persistent challenges in India's agricultural and supply chain sectors.

MEDIUM TERM OUTLOOK:
DEREGULATION DRIVES GROWTH

The Survey positions deregulation as the linchpin for India's economic expansion in an era marked by geoeconomic fragmentation, shifting global trade dynamics, and increasing reliance on domestic growth levers. It posits that India's path to becoming a Viksit Bharat by 2047 hinges on reducing regulatory compliance burdens, nurturing economic freedoms, and systematically enhancing investment efficiency. Although the Survey has adeptly integrated macroeconomic data and policy imperatives, yet certain analytical gaps persist, particularly concerning comparative global benchmarking, institutional constraints, and the socio-economic ramifications of deregulation.

According to the IMF’s World Economic Outlook (WEO) projections (October 2024):

- India is expected to become a US $5 trillion economy by FY28 and reach US $6.3 trillion by FY30, reflecting an annual nominal growth rate of 10.2% (FY25–FY30).
- India’s nominal GDP grew at a compounded annual rate of 12.4% (FY94–FY24), but is projected to slow to 10.7% (FY25–FY30).
- The rupee’s projected depreciation is merely 0.5% per annum, significantly lower than the 3.3% annual depreciation experienced over the past three decades, indicating enhanced macroeconomic stability.

While these figures exude optimism, a critical examination of the following is indeed warranted:

- The assumption that the rupee will depreciate only 0.5% per year is contingent upon India’s inflation convergence with the US and stable capital inflows. However, capital flight risks, external debt composition (42% short-term), and trade imbalances (CAD projected to rise to 2.2% of GDP by FY30) pose downside risks.
- India’s projected real GDP growth rate of 6.5% (FY26–FY30), while robust, remains below the historical East Asian growth models (Japan post-WWII, China 1990s–2000s), which maintained 8–10% real growth rates for over two decades.

For sustained 8% real GDP growth, the investment rate must increase from 31% to 35% of GDP. However, this transition necessitates:

- **Greater private sector participation**; given public capex constraints, deregulation must catalyse private investment in manufacturing, infrastructure, and technology.
- **Sectoral diversification**; over-reliance on services exports (IT, business services) leaves India vulnerable to external shocks; manufacturing-led growth must be prioritised.
- **Labour market reforms**; with 78.5 lakh non-farm jobs required annually till 2030, reducing labour rigidity and enhancing formal employment generation becomes imperative.

The Survey also indicates a paradigm shift from hyper-globalisation to geo-economic fragmentation (GEF), characterised by:

- A surge in global trade restrictions. Between October 2023-October 2024, WTO members introduced 169 new trade-restrictive measures covering US $887.7 billion in trade, up from US $337.1 billion in the preceding year.
- The FDI concentration among geopolitical blocs. IMF estimates global output losses from trade fragmentation could reach 7% of GDP, rising to 12% with technological decoupling.

The Survey presents some rather compelling data on China's disproportionate control over global manufacturing, which are mentioned as under:

- In 2000, China accounted for just 6% of global industrial production; by 2030, it is projected to command 45% (as per UNIDO data).
- China's EV, solar, and battery dominance is near absolute:
    - Over 80% global solar PV supply chain
    - 60% of global wind energy capacity
    - 80% of lithium-ion battery production
    - 70%+ rare earth elements (REEs) mineral processing
    - In 2022 alone, China invested US $546 billion in clean energy sectors, compared to US $321 billion by the US and EU combined.

Needless to enunciate, these strides have a serious implication for India, i.e., glaring supply chain vulnerabilities. India imports 75% of lithium-ion batteries from China and lacks production capacity for polysilicon, ingots, and wafers. While initiatives such as PLI for Advanced Chemistry Cells (ACC) and Khanji Bidesh India Limited (KABIL) aim to secure mineral resources, a coherent industrial strategy to mitigate China dependence remains elusive.

The Survey does identify regulatory burdens as the principal constraint on India's investment and employment growth. High compliance costs disproportionately affect MSMEs, limiting their ability to scale, formalise, and access institutional credit. Also, the rigid labour laws encourage informal employment, with overtime pay restrictions forcing workers into unregulated sectors. Not to forget that zoning and land-use regulations artificially constrain urban expansion, driving higher commercial real estate costs.

This Survey advocates a second wave of business-friendly reforms (EoDB 2.0), such as:

- Removing arbitrary restrictions on female employment in factory processes.
- Reducing mandatory setbacks and parking norms, which inflate land costs and deter industrial expansion.

- Enhancing fire safety compliance efficiency by extending validity periods for low-risk buildings.
- India's industrial power tariffs are 10–25% higher than cost, compared to Vietnam, which subsidises industrial electricity.

The Survey benchmarks international regulatory frameworks, advocating that the US model of Office of Management and Budget (OMB) assesses cost-effectiveness of all federal regulations. Also, that UK's "One-in, Two-out" principle mandates that every new regulatory cost must be offset by eliminating two existing regulations. The Survey also brings focus on New Zealand's Ministry of Regulation that conducts continuous assessment and repeal of inefficient laws.

The document does outline the potential risks of deregulation. Excessive deregulation may weaken consumer and environmental protections, necessitating measured implementation. Additionally, relaxing labour laws without adequate social safety nets could further widen income inequality. Without an iota of doubt deregulation requires enhanced administrative efficiency in order to ensure effective oversight in high-risk sectors.

The annual report card has offered a compelling argument for systemic deregulation as a catalyst for long-term economic expansion. However, the policy narrative must incorporate a balanced approach that safeguards regulatory efficacy while enabling economic freedoms.

A few key takeaways for policy action have been mentioned below:

1. Expand domestic industrial capacity through supply chain de-risking, targeted incentives, and infrastructure augmentation.
2. Reduce regulatory burdens for MSMEs to enhance competitiveness and employment generation.
3. Enhance institutional efficiency to complement deregulation with effective governance mechanisms.
4. Mitigate China dependence through strategic industrial alliances and domestic capacity-building.

India's Viksit Bharat vision hinges not merely on reducing regulation, but on refining its quality, ensuring that governance enhances - rather than inhibits - entrepreneurial dynamism. The Economic Survey's vision of deregulation as the bedrock of long-term prosperity remains persuasive, provided it is executed with prudence and precision.

INVESTMENT & INFRASTRUCTURE:
KEEPING IT GOING

Capital Expenditure & Public Investment

- **Government Capex Growth**:
  - Capital expenditure in infrastructure grew at a trend rate of 38.8% from FY20 to FY24.
  - The post-election period (July-Nov 2024) saw a recovery in infrastructure capex after a slowdown in Q1 FY25 due to elections and monsoon delays.
  - Ministries utilised 60% of the budgeted capex for infrastructure (April-Nov 2024), higher than previous election years.

- **National Infrastructure Pipeline (NIP)**:
  - ₹111 lakh crore investment planned from FY20-FY25.
  - Covers 9,766 projects across 37 sub-sectors, tracked via the India Investment Grid.

- **National Monetisation Pipeline (NMP)**:
  - Targets ₹1.91 lakh crore in FY25, with ₹3.86 lakh crore mobilised from FY22-FY24.
  - Roads, power, coal, and mining sectors led in asset monetisation.

Physical Connectivity

Railways

- **Infrastructure Expansion**:
  - 2,031 km of railway network commissioned in Apr-Nov 2024.
  - 17 new Vande Bharat train pairs were introduced; 900 Vande Bharat coaches produced.
  - **Gati Shakti Cargo Terminals**: 91 commissioned, 234 locations approved.

- **Sustainability and PPP Models**:
  - Indian Railways aims for 30 GW renewable energy by 2029-30.
  - 17 PPP railway projects completed (₹16,434 crore), 8 ongoing (₹16,614 crore).
  - **Mumbai-Ahmedabad Bullet Train Project:** ₹1.08 lakh crore investment, 47.17% completed.

Roads

- **Total Road Network**: 63.4 lakh km, NHs account for 146,195 km (2% of network, carrying 40% of road freight).
- **NH Construction**:
  - 5,853 km of NHs constructed (Apr-Dec 2024).
  - **Bharatmala Pariyojana**: 34,800 km planned, 76% projects awarded, 18,926 km completed.
  - **Char Dham Mahamarg Project**: 620 km of 825 km completed.
- **Sustainability Measures**:
  - Advanced Traffic Management System (ATMS) covers 4,000 km.
  - Vehicle Scrapping Policy operational with 82 scrapping centres.
  - Multi-Modal Logistics Parks (MMLPs) awarded in Chennai, Indore, Nagpur, etc.

Civil Aviation

- ₹91,000 crore capex planned (FY20-FY25), 91% achieved.
- **UDAN (Regional Connectivity Scheme)**:
  - 619 routes, 88 airports, 2 water aerodromes, 13 heliports operationalised.
  - Airport cargo handling capacity reached 8.0 million MT in FY24.

Ports & Waterways

- **Port Infrastructure**:
  - 3 MTPA capacity added in FY25 (Apr-Nov), average container turnaround time reduced from 48.1 to 30.4 hours.
  - Vadhavan Mega Port Project (₹76,000 crore) to be India’s largest container port.
  - Chabahar Port traffic increased by 43%; Sittwe Port boosts NE connectivity.
- **Sagarmala Programme**:
  - Total 482 projects, highest completion in port modernisation and industrialisation.
  - 12 smart industrial cities planned under port-led industrialisation.
  - 25,000 acres of salt land identified for port expansion.

Power & Renewable Energy

- **Power Capacity Expansion:**
    - 456.7 GW installed capacity (+7.2% YoY as of Nov 2024).
    - Renewable Energy share reached 47% (209.4 GW).
    - India targets 500 GW non-fossil fuel energy by 2030.
    - Deen Dayal Upadhyaya Gram Jyoti Yojana (DDUGJY) electrified 18,374 villages.
    - SAUBHAGYA scheme connected 2.9 crore households.
- **Electricity Distribution Reforms:**
    - ₹3.0 lakh crore Revamped Distribution Sector Scheme aims to modernise power grids.
    - Rooftop solar policy simplified, EV charging infrastructure expanded.
    - Power supply reliability improved: 23.4 hours/day in urban, 21.9 hours in rural areas.

Digital Connectivity

- **5G Rollout:**
    - 4.6 lakh 5G base stations installed, 5G available in 779 of 783 districts.
    - Universal Service Obligation Fund renamed 'Digital Bharat Nidhi' (DBN).
    - BharatNet laid 6.92 lakh km of optical fiber, covering 2.14 lakh Gram Panchayats.
    - Satellite connectivity projects launched in Andaman & Nicobar and Lakshadweep.
- **Data Center Growth:**
    - India's data center capacity reached 977 MW in 2023 (+105% YoY).
    - Market to grow from US $4.5B (2023) to US $11.6B (2032) at 10.98% CAGR.
    - Cost advantage: India's data centres cost US $6.8M per MW (vs. $9.17M in Australia).

Rural & Urban Infrastructure

<u>Rural</u>

- **Jal Jeevan Mission (JJM):**
    - Tap water coverage increased from 17% (2019) to 79.1% (2024).
    - 8 states, 3 UTs achieved 100% coverage.

- **Swachh Bharat Mission-Grameen (SBM-G):**

    - 3.64 lakh villages declared ODF Plus.
    - NADEP composting in Madhya Pradesh generates ₹30,000 per farmer annually.

<u>Urban</u>

- **PMAY-U**:
    - 1.18 crore houses sanctioned, 89 lakh completed.
    - PMAY-U 2.0 launched for 1 crore more houses.

- **Smart Cities Mission**:
    - 7,479 projects worth ₹1.50 lakh crore completed.
    - 10.2 million daily metro commuters across 23 cities.

Tourism & Space Infrastructure

- **PRASHAD & Swadesh Darshan**:

    - 76 tourism projects completed under PRASHAD.
    - ₹3,295.8 crore allocated for ‘Iconic Tourist Centres’.

- **Space Sector**:

    - 56 active satellites, India’s first private satellite launch under NSIL.
    - ISRO’s Bhuvan platform is used for infrastructure monitoring.

Challenges and Risks

- **Funding Gap**: The infrastructure sector faces a funding gap of ₹20 lakh crore over the next five years.
- **Land Acquisition**: Delays in land acquisition remain a major bottleneck, affecting 25% of projects.
- **Regulatory Hurdles**: Complex approval processes and environmental clearances delay project implementation.

Urban Infrastructure

<u>Atal Mission for Rejuvenation and Urban Transformation (AMRUT)</u>

- **AMRUT Phase 1 (2015-2021):** Focused on improving water supply and sewerage.
- **AMRUT 2.0 (2021-2026):** Expanded to all statutory towns with a ₹2.77 lakh crore allocation.
- **Achievements**:
  - Water supply coverage improved to 70%, sewerage coverage to 62%.
  - 4,649 MLD of additional water treatment capacity created.
  - 5,070 acres of new green spaces developed.

<u>Real Estate & Housing</u>

- **Real Estate Regulatory Authority (RERA):**
  - 1.38 lakh real estate projects and 95,987 agents registered as of Jan 2025.
  - 1.38 lakh complaints resolved by RERA authorities.
- **Affordable Housing & PMAY-U 2.0 (Launched in Sep 2024):**
  - 29 states/UTs signed agreements.
  - ₹6 lakh crore approved for housing projects in FY25.

Urban Transport:
  - 1,010 km metro rail operational across 23 cities; 980 km under construction.
  - Metro ridership reached 10.2 million daily commuters in FY25.

Infrastructure Sustainability & Climate Initiatives

<u>Green Construction & Circular Economy</u>

- **Green Highways Policy 2024**:
  - Mandatory use of 30% recycled materials in road construction.
  - Pilot projects in 5 states using plastic waste in road construction.

- **Energy-Efficient Buildings**:
  - Smart city projects promoting solar-powered streetlights and rainwater harvesting.

Investment & Financing Mechanisms

Private Sector & Public-Private Partnerships (PPPs)

- 17 PPP railway projects completed (₹16,434 crore).
- ₹38,000 crore of PPP investment in ports.
- Investment Trusts (InvITs) & Real Estate Investment Trusts (REITs) are driving private participation in infrastructure.

Sovereign Green Bonds

- Raised ₹20,000 crore in FY24 for renewable energy and climate projects.
- India is the second-largest issuer in Asia for green bonds

Challenges and Future Outlook

- India needs a continued step-up of infrastructure investment over the next two decades to sustain a high rate of growth. Requirements are aplenty. Accelerating our efforts to build integrated multi-modal transport, coupled with the modernisation of existing physical assets, will improve efficiency and last-mile connectivity.
- Private participation should accelerate in many critical infrastructure sectors in many ways- programme and project planning, financing, construction, maintenance, monetisation and impact assessment.

ALL ABOUT BUSINESS REFORMS

While India has made strides in improving its global manufacturing share, its 2.8% contribution remains far behind China's 28.8%, highlighting the need for more aggressive reforms. The survey acknowledges structural challenges but lacks urgency in advocating for transformative policies.

Steel Industry

- India's crude steel production grew by 3.3%, while finished steel production increased by 4.6% in FY25.
- Public infrastructure projects and construction expansion continue to drive demand.
- Despite growth, India remains a net steel importer due to lower international prices reducing export margins.
- The Steel Scrap Recycling Policy enhances energy efficiency and sustainability, but ensuring high-quality scrap availability remains a challenge.

Cement Industry

- India is the second-largest cement producer globally, with an annual installed capacity of 639 million tonnes.
- The sector is crucial for infrastructure development but faces challenges in reducing carbon emissions.
- Most plants are strategically located near raw material sources, yet logistical costs remain a concern.
- Per capita domestic cement consumption stands at 290 kg, indicating growth potential.

Chemical and Petrochemical Industry

- Contributes 9.5% to the manufacturing sector's GVA, but remains highly import-dependent.
- Around 45% of petrochemical intermediates are sourced from abroad, highlighting the need for enhanced domestic production.
- Addressing this supply-demand gap is critical for reducing India's vulnerability to external price shocks.

Capital Goods Industry

- Production fluctuated between FY20 and FY23 but saw robust growth in FY24.
- The sector still relies on imported high-end machinery due to technological gaps.
- Government's Phase II of the Capital Goods Competitiveness Scheme aims to enhance self-sufficiency through advanced R&D and smart manufacturing initiatives.

Automobile Industry

- Domestic automobile sales grew by 12.5% in FY24, making the industry a key economic driver.
- The government extended the PLI Scheme by one year to support innovation and sustainable manufacturing.
- The shift towards electric vehicles is promising, but infrastructure gaps, such as charging networks, need urgent attention.

Electronics Industry

- Domestic production surged from ₹1.90 lakh crore in FY15 to ₹9.52 lakh crore in FY24.
- Smartphone manufacturing has significantly reduced import dependence, with 99% now produced domestically.
- Despite growth, India's global market share remains at just 4%, with the sector heavily reliant on assembly rather than design and component production.

Textile Industry

- Accounts for 11% of India's manufacturing GVA, making it a major employment generator.
- India is a leading producer of jute, cotton, silk, and man-made fibres but lags in global competitiveness.
- Textile exports have declined from US $44.44 billion in FY22 to US $35.87 billion in FY24, reflecting demand fluctuations.
- High logistical costs, technological gaps, and a limited scale of operations continue to hinder growth.

Pharmaceutical Industry

- India ranks third globally in pharmaceutical production, with a total annual turnover of ₹4.17 lakh crore in FY24.
- Exports accounted for 50% of total turnover, reaching ₹2.19 lakh crore.
- Government initiatives like the PLI scheme and SPI program aim to reduce reliance on imported APIs and intermediates.
- R&D spending remains lower than global leaders, restricting innovation in new drug development.

R&D and Innovation

- India ranks 6th globally in patent filings, yet GERD is just 0.64% of GDP, far behind China’s 2.1%.
- R&D is government-dominated, while private sector contributions remain low compared to advanced economies.
- Key focus sectors like pharmaceuticals, IT, and defence receive the bulk of funding, leaving other industries under-supported.
- A shift towards applied research and stronger industry-academia collaboration is essential.

MSME Challenges

- Employs 23.24 crore people, making it the second-largest job provider after agriculture.
- Udyam Registration and Udyam Assist have facilitated formalisation, but financial constraints persist.
- The Credit Guarantee Scheme’s expansion is positive, yet bureaucratic hurdles limit MSMEs' scalability.
- Delayed payments remain a significant issue despite mechanisms like the MSME Samadhan Portal.

Industrial Growth and Regional Disparities

- Gujarat, Maharashtra, Karnataka, and Tamil Nadu account for 43% of industrial GSVA, while the Northeast (excluding Assam and Sikkim) contributes only 0.7%.
- Ease of Doing Business (BRAP 2020) rankings show progress, but regional disparities remain unaddressed.
- Decentralised industrial strategies and region-specific incentives are crucial for balanced development.

India’s manufacturing ambitions require bold reforms, not incremental changes. The key priorities include:

1. **Boosting R&D**: Raising GERD to at least 2% of GDP and incentivising private sector investment in research.
2. **MSME Support**: Reducing red tape, ensuring timely payments, and expanding access to affordable credit.
3. **Balanced Industrial Growth**: Addressing regional disparities through targeted incentives and improved infrastructure.

4. **Technological Self-Reliance**: Moving from assembly-based manufacturing to indigenous design and production.
5. **Sustainable Industrialisation**: Scaling green initiatives in key industries like steel, cement, and chemicals.

India has the potential to become a global manufacturing powerhouse, but achieving this goal requires decisive, structural shifts rather than piecemeal policy adjustments. The government's commitment to business reforms is evident, but the true challenge lies in execution and sustained transformation.

SERVICES:
NEW CHALLENGES FOR THE OLD WAR HORSE

The Economic Survey 2024-25 reiterates the primacy of services in India's economic structure, both as a driver of gross value added (GVA) and as a buffer against manufacturing volatility in an uncertain global landscape. It ensures to highlight how the “servicification” of manufacturing, the digitisation of logistics, and the integration of India into global technology supply chains have reinforced the services sector’s role in employment generation and economic resilience.

The Survey does posit a dual narrative, that is, on one hand, services remain a pillar of economic expansion, contributing 55% of GVA in FY25 (up from 50.6% in FY14), while on the other, the sector grapples with global headwinds, including geopolitical disruptions, inflationary pressures, and evolving regulatory landscapes.

The Economic Survey highlights India’s ascendant role in global services exports, which has compensated for volatility in merchandise trade. India’s services export share rose from 1.9% in 2005 to 4.3% in 2023, ranking seventh globally. The US (13%), UK (7.4%), and Germany (5.5%) lead global services trade, while India has outpaced France and China (both at around 5%).

The export trend rate for services was 11% compound annual growth rate (CAGR) between FY14-FY23, significantly outperforming merchandise exports (5.7% CAGR). While India’s export-led services growth appears robust, the Survey omits competitor benchmarking; China’s services exports have grown in higher-value segments (financial and digital services), whereas India's dominance remains confined to IT and business process outsourcing (BPO). Also, India relies on digital trade openness in key export markets - the US, UK, and the EU, making it susceptible to data localisation laws and protectionist policies.

It is a widely known fact that India’s services sector has witnessed consistent growth, barring the COVID-19 contraction (FY21). The sector’s CAGR pre-pandemic was 8%, which has risen to 8.3% in FY23–FY25, primarily driven by the following sub-sectors:

- **Information & Communication Services**: CAGR of 12.8% from FY13 to FY23, increasing its GVA share from 6.3% to 10.9%.
- **Financial, Real Estate & Professional Services**: Contributed 45% of total services GVA growth in H1 FY25.
- **Logistics & Transport**: Recovered post-pandemic, with PMI for services remaining in expansion for 41 consecutive months (August 2021–December 2024).

Despite such strong growth figures, integral structural challenges remain unaddressed, such as:

- The services sector employs only 30% of the workforce, disproportionately lower than its 55% share in GVA, indicating a productivity skew that limits employment elasticity.

- While BFSI, IT, and professional services expand, low-wage segments (trade, repair, hotels, restaurants) struggle with formalisation.
- The Ease of Doing Business (EoDB) 2.0 reforms aim to streamline compliance, but MSMEs in services continue to grapple with licensing bottlenecks.

Particularly in Financial Services and Banking, the outstanding credit to services sector stood at INR 48.5 lakh crore (Nov 2024). The FDI inflows to services totaled US $5.7 billion (H1 FY25), with insurance receiving 62%. While financialisation trends are promising, credit penetration in MSME services remains inadequate. The insurance sector's dominance in FDI inflows indicates foreign investors prefer high-margin, capital-light models rather than broader service sector investments.

The IT sector revenue reached US $254 billion in FY24, with exports at US $200 billion. Global Capability Centres (GCCs) expanded from 1,430 (FY19) to 1,700+ (FY24), employing 1.9 million professionals. AI adoption in services - particularly BFSI, telecom, and e-commerce - has accelerated, with India accounting for 28% of the global STEM workforce. With US and UK tightening outsourcing regulations, India's IT exports growth could be severely curtailed. While India leads in tech services, it lags in intellectual property (IP) creation, with low AI/ML patent filings relative to China and the US.

The country's railway freight grew 5.2% YoY, with e-ticketing adoption at 86%. Road transport accounts for 78% of total transport GVA. FASTag adoption has reduced toll plaza wait times from 734 seconds to 47 seconds. These numbers suggest why India's logistics costs remain 13-14% of GDP, compared to 8-9% in China and 7% in Europe. While initiatives like PM Gati Shakti aim for multimodal logistics efficiency, last-mile delivery constraints persist.

On the one hand, India became the fastest-growing aviation market, handling 32 crore passengers in FY24, while on the other, port cargo movement reached 622 MT (Apr-Dec 2024), with Maritime India Vision 2047 targeting global top-5 shipbuilding status. The aviation sector's Maintenance, Repair, Operations (MRO) industry remains underdeveloped, compelling airlines to outsource repairs to Singapore and Dubai.
Despite port expansion, turnaround times remain higher than global benchmarks.

The Survey has categorised states based on their service-industrial synergy. The states of Gujarat, Uttarakhand and Himachal Pradesh exhibit high industrialisation and lower services orientation. The southern states of Karnataka and Telangana are driven by IT, finance, and real estate. The high revenue generating states of Maharashtra and Tamil Nadu display balanced industry-service growth. The states of Bihar, Jharkhand and West Bengal continue to be a cause of worry with a high unorganised services sector, requiring urgent formalisation.

Ergo, in India, state-wise service inequality is stark, with Maharashtra and Karnataka accounting for over 25% of gross state value added (GSVA). Also, public administration dominates in smaller states, with North-East states reliant on government spending rather than commercial services growth.

The Economic Survey 2024-25 has presented a nuanced yet optimistic picture of India's services-led growth trajectory, but policy interventions must address structural inefficiencies and global risks. A few suggested policy priorities for giving a fillip to the sector are mentioned below:

1. **Strengthen AI and deep-tech integration**; ensure moving beyond IT outsourcing to innovation-driven growth.
2. **Reduce logistics costs**; accelerate PM Gati Shakti execution and last-mile logistics digitisation.
3. **Expand service sector formalisation**; incentivise MSME formalisation through tax rationalisation and compliance simplification.
4. **Leverage digital trade diplomacy**; mitigate protectionist headwinds in the US and EU for IT-BPO exports.

In summation, India's service sector remains the "old war horse" driving economic growth, but it must evolve into a high-value services powerhouse to sustain long-term global competitiveness.

AGRICULTURE AND FOOD MANAGEMENT:
THE SECTOR OF THE FUTURE

Agriculture Sector Overview

- **Contribution to GDP**: Agriculture and allied activities contribute 16% to India's GDP (FY24) and support 46.1% of the population.
- **Growth Rate**: The sector grew at 3.5% in Q2 FY25, recovering from a low of 0.4% in previous quarters.
- **Resilience**: The sector has shown resilience with an average growth rate of 5% from FY17 to FY23, driven by government initiatives and favourable weather conditions.
- **Kharif Production**: Kharif foodgrain production in 2024 is projected at 1647.05 Lakh Metric Tonnes (LMT), an increase of 89.37 LMT from the previous year.

Crop Production and Diversification

- **Crop Yields**: India accounts for 11.6% of global cereal production, but yields are lower compared to other leading producers.
- **Crop Diversification**: High-value sectors like horticulture, livestock, and fisheries are driving growth, with fisheries showing the highest CAGR at 13.67% (FY15-FY23).
- **Floriculture**: India's floriculture industry has grown into a 100% export-oriented sector, with 297,000 hectares under cultivation in FY24, producing 2.28 million tonnes of loose flowers and 947,000 tonnes of cut flowers.
- **Horticulture**: India is a leading exporter of fresh grapes, with 343,982.34 MT exported in FY24, worth ₹3,460.70 crore.

Minimum Support Price (MSP) and Crop Insurance

- **MSP**: The government has increased MSP for key crops like arhar (59%), bajra (77%), masur (89%), and rapeseed (98%) over the weighted average cost of production.
- **Crop Insurance**: The Pradhan Mantri Fasal Bima Yojana (PMFBY) enrolled 4 crore farmers in FY24, covering 600 lakh hectares, a 19% increase from FY23.

Seeds, Fertilizers, and Soil Health

- **Seed Quality**: ICAR produced 1.06 lakh quintals of breeder seeds in FY24, with 2,177 climate-resistant varieties released since 2014.
- **Fertilizers**: The introduction of Urea Gold (urea with sulphur) and the use of drones and fertigation techniques are optimizing fertilizer application.
- **Soil Health**: The PM-PRANAM initiative promotes the use of alternative fertilizers like Nano Urea and Nano DAP to improve soil health.

Irrigation and Water Management

- **Irrigation Coverage**: 55% of the gross cropped area is irrigated, with states like Punjab (98%), Haryana (94%), and Telangana (86%) leading in irrigation coverage.
- **Micro-Irrigation**: The Per Drop More Crop (PDMC) scheme has covered 95.58 lakh hectares under micro-irrigation, with ₹21,968.75 crore released since FY16.
- **Rain-fed Agriculture**: The Rain-fed Area Development (RAD) program has covered 8.00 lakh hectares with ₹1,858.41 crore allocated since FY15.

Agricultural Credit and Mechanisation

- **Kisan Credit Card (KCC)**: 7.75 crore operational KCC accounts with ₹9.81 lakh crore outstanding loans as of March 2024.
- **Ground-Level Credit (GLC)**: GLC to agriculture grew at a CAGR of 12.98% from FY15 to FY25, reaching ₹25.48 lakh crore in FY24.
- **Farm Mechanisation**: 26,662 Custom Hiring Centres (CHCs) established, with 15,000 drones approved for Women SHGs to provide rental services for agricultural purposes.

Agricultural Extension and Marketing

- **Extension Services**: Over 3.66 million farmers benefited from extension activities in FY24, with 4.49 million availing services by November 2024.
- **e-NAM**: 9,204 FPOs registered on the e-NAM platform, with 4,490 receiving equity grants of ₹237 crore.
- **Agriculture Marketing Infrastructure (AMI)**: 48,611 storage infrastructure projects sanctioned, with ₹4,795.47 crore disbursed in subsidies.

Climate Action in Agriculture

- **National Mission on Sustainable Agriculture (NMSA)**: Focuses on water efficiency, soil health, crop insurance, and climate-resilient varieties.
- **Organic Farming**: 52,289 clusters covering 14.99 lakh hectares under Paramparagat Krishi Vikas Yojana (PKVY), benefiting 25.30 lakh farmers.
- **Composite Index of Agricultural Sustainability**: States like Mizoram, Kerala, and Madhya Pradesh score higher than the national average (0.49).

Allied Sectors: Livestock and Fisheries

- **Livestock Sector**: Contributed 30.23% to agricultural GVA in FY23, with milk production generating ₹11.16 lakh crore.

- **Fisheries**: Total fish production reached 184.02 lakh tonnes in FY23, with seafood exports growing by 29.70% to ₹60,523.89 crore in FY24.
- **Pradhan Mantri Matsya Sampada Yojana (PMMSY):** Launched to boost aquaculture productivity, with 16.35 lakh fish producers registered on the National Fisheries Digital Platform (NFDP).

Cooperative Societies

- **Primary Agricultural Credit Societies (PACS):** 9,000 new PACS established, with 35,293 functioning as Pradhan Mantri Kisan Samriddhi Kendras (PMKSK).
- **RuPay Kisan Credit Cards**: Issued to dairy cooperatives to improve financial access.

Food Processing Industry

- **Employment**: The food processing industry accounts for 12.41% of total organised manufacturing employment.
- **Exports:** Agri-food exports reached USD 46.44 billion in FY24, with processed food exports contributing 23.4%.
- **Pradhan Mantri Kisan Sampada Yojana (PMKSY):** 1,079 projects completed, with ₹8,910 crore invested under the Production Linked Incentive Scheme for Food Processing (PLISFPI).

Food Security and Management

- **National Food Security Act (NFSA**): Covers 81.35 crore people, providing subsidized food grains.
- **Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY)**: Extended for five years from January 2024, providing free food grains to 80 crore beneficiaries.
- **e-KYC Compliance**: 100% e-KYC compliance under the One Nation, One Ration Card (ONORC) scheme, benefiting migrant workers.

Challenges and Future Outlook

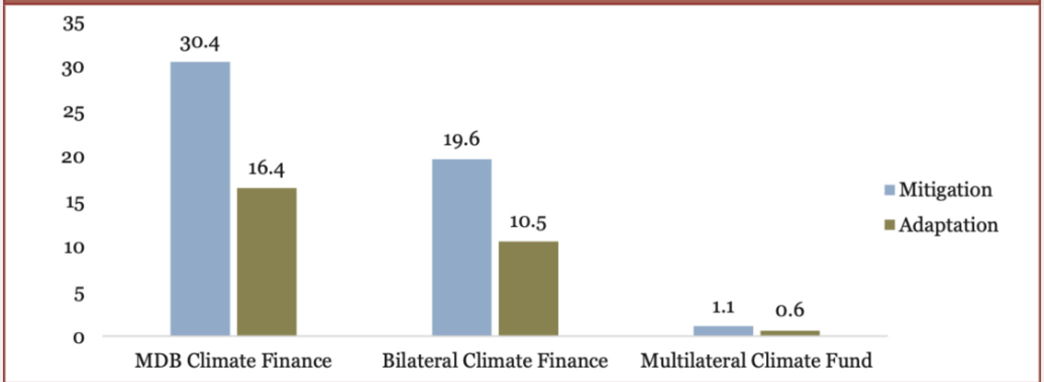
- **Climate Change**: Increased frequency of droughts and erratic rainfall patterns pose significant risks to agriculture.
- **Water Scarcity**: Micro-irrigation and water conservation practices are critical to addressing water scarcity.
- **Market Efficiency**: Strengthening e-NAM and supporting FPOs are essential for improving price discovery and market access.
- **Policy Shifts**: Encouraging crop diversification, reducing overproduction of cereals, and promoting balanced fertilizer use are key to sustainable growth.

CLIMATE AND ENVIRONMENT:
ADAPTATION MATTERS

Introduction

- **India's Climate Goals:** India aims to achieve developed nation status by 2047, focusing on inclusive and sustainable development. Despite low per capita carbon emissions (one-third of the global average), India faces challenges in renewable energy deployment due to lack of storage technology and access to critical minerals.

Chart X.1: International flow of finance in 2021-22 (in USD billion)



Source: Based on the Sixth Biennial Assessment and Overview of Climate Finance Flows by the Standing Committee of Finance, UNFCCC. The flow of finance to cross-cutting actions has not been included here. The report can be accessed at https://tinyurl.com/52md2zht.

- **Adaptation Expenditure**: Adaptation expenditure increased from 3.7% to 5.6% of GDP between FY16 and FY22, highlighting its importance in India's development strategy.
- **Lifestyle for Environment (LiFE)**: The LiFE initiative promotes sustainable practices and a circular economy, aiming to transform consumption and production behaviours.

Adaptation Strategy

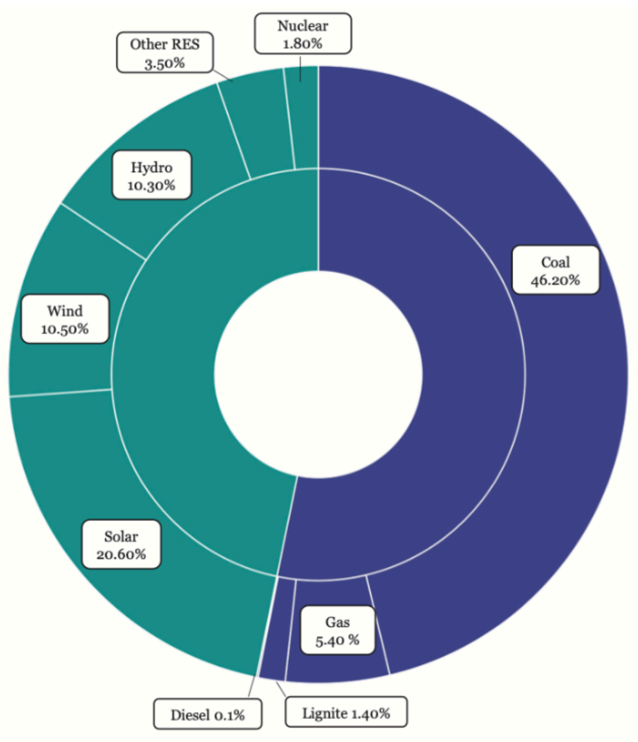
- **Vulnerability to Climate Change**: India is the seventh most vulnerable country to climate change, facing extreme weather events, sea-level rise, and water insecurity.
- **National Adaptation Plan (NAP)**: The Ministry of Environment, Forest and Climate Change (MoEFCC) is developing a comprehensive NAP to align with sustainable development goals and ensure climate resilience.
- **Adaptation in Agriculture**: Focus on climate-resilient seeds, groundwater preservation, soil health, and modified cropping practices to ensure food security.
- **Urban Resilience**: Initiatives like the National Mission on Sustainable Habitat (NMSH) and Atal Mission for Rejuvenation and Urban Transformation (AMRUT) aim to address urban flooding, heat stress, and water management. As of December 2024, 785 stormwater drainage projects and 2,438 parks have been developed under AMRUT.

- **Coastal Adaptation**: The Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI) aims to restore 540 square kilometres of mangroves over five years, creating 22.8 million mandays of employment and sequestering 4.5 million tons of carbon.
- **Water Management**: The Jal Shakti Abhiyan focuses on rainwater harvesting, water body mapping, and afforestation. The Bhu-Neer portal and FloodWatch India app provide real-time groundwater and flood management data.

Energy Transition

- **Energy Consumption Trends**: G7 countries still rely heavily on fossil fuels, with per capita energy consumption shifting from coal and oil to gas. Electricity prices in G7 countries have risen due to the integration of renewables.
- **India's Energy Mix**: As of November 2024, 46.8% of India's installed electricity capacity comes from non-fossil fuels (solar: 20.6%, wind: 10.5%, hydro: 10.3%, nuclear: 1.8%). The goal is to reach 50% by 2030.

Chart X.5: India's Installed Generation Capacity (fuel-wise) (30 November 2024)



Source: Internal calculation based on data from Ministry of Power https://powermin.gov.in/sites/default/files/uploads/power_sector_at_glance_Nov_2024.pdf.

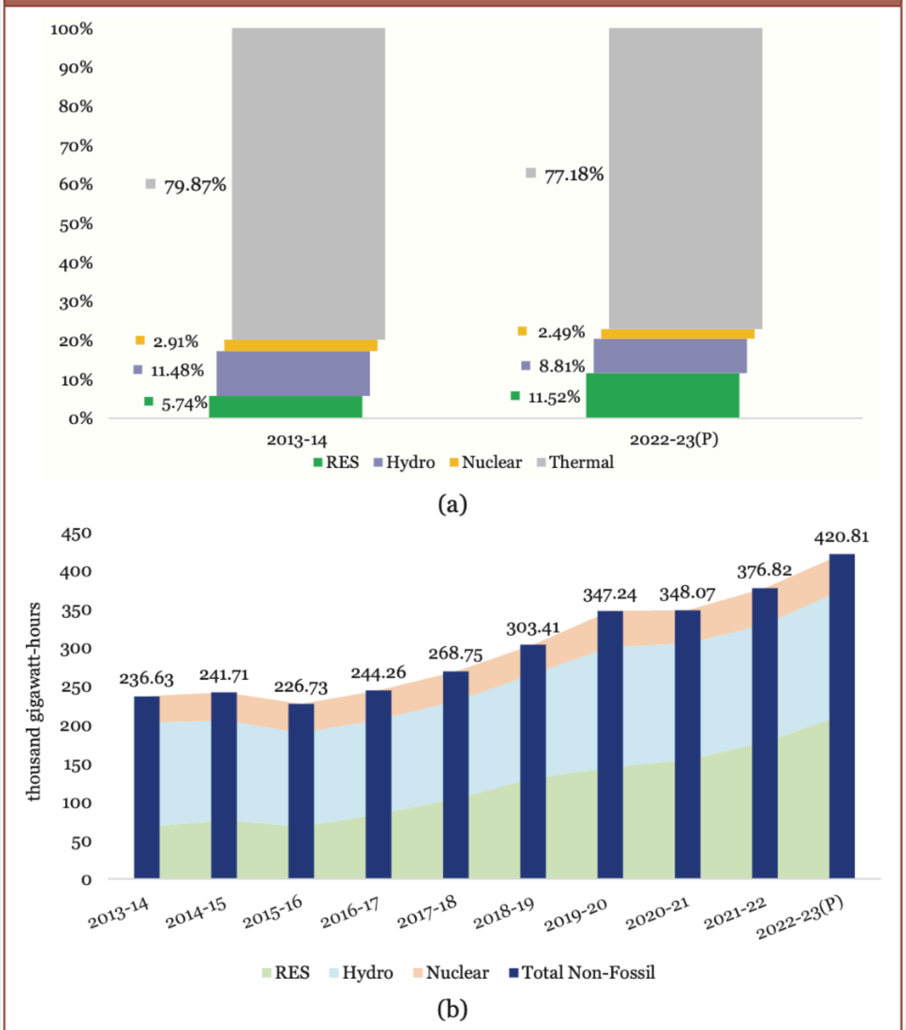
- **Coal Dependency**: Coal remains a reliable and affordable energy source for India, contributing to 88% of the US's coal-fired capacity built between 1950 and 1990. India has commissioned 65,290 MW of supercritical and 4,240 MW of ultra-supercritical coal power plants.

- **Nuclear Energy Challenges:** Nuclear energy faces public safety concerns, geographical concentration of uranium, and reliance on fossil fuel supply chains for sulphuric acid production.

Renewable Energy Initiatives

- **Solar Power**: The PM-Surya Ghar: Muft Bijli Yojana aims to install rooftop solar plants in one crore households, targeting 40-45 GW of rooftop solar capacity by 2027. As of January 2025, 7 lakh households have installed rooftop solar systems.
- **Offshore Wind Energy**: A Viability Gap Funding (VGF) scheme of ₹7,453 crore has been introduced for 1 GW of offshore wind projects.
- **Green Hydrogen Mission**: Aims to produce 5 million metric tonnes of green hydrogen annually by 2030, with 412,000 tonnes of production capacity already awarded.
- **Bioenergy**: The National Bioenergy Programme has installed 9.8 GW of biomass power and 249.74 MW of waste-to-energy projects.

Chart X.6: Growing energy generation from non-fossil fuels in India (Utilities and Non-Utilities)



Source: Based on Tables 3.6 (a) and (b) in Energy Statistics of India 2024, M/o Statistics, Planning and Implementation. Accessed from https://www.mospi.gov.in/publication/energy-statistics-india-2024-1.

Financial Regulation and Green Investments

- **ESG Reporting**: SEBI introduced the Business Responsibility and Sustainability Report (BRSR) for top 1000 listed companies, mandatory from FY23. The BRSR Core will be expanded to top 500 companies by FY26.
- **Green Bonds**: Sovereign Green Bonds (SGrBs) worth ₹16,000 crore were issued in FY23 and ₹20,000 crore in FY24. Green debt securities amounting to ₹6,128 crore have been issued by listed companies.
- **Green Deposits**: RBI introduced a framework for green deposits to encourage funding for renewable energy projects, classified under priority sector lending.

Lifestyle for Environment (LiFE)

- **Global Movement**: The LiFE initiative, endorsed by the UN Environment Assembly, aims to mobilise one billion Indians and global citizens to adopt sustainable lifestyles by 2028.
- **Dietary Impact**: Cutting dairy and meat from diets can reduce emissions by 66%. A plant-based diet can reduce an individual's carbon footprint by up to 2.1 tons annually.
- **Urban and Rural Goals**: By 2028, 80% of villages and urban local bodies are targeted to become environmentally friendly.

Circular Economy and Resource Efficiency

- **Economic Benefits**: The circular economy could save 11% of GDP in 2030 and 30% in 2050. India promotes recycling e-waste and plastic waste through Extended Producer Responsibility (EPR) frameworks.
- **Plastic Waste Management**: India's per capita plastic consumption is 14 kg, compared to over 100 kg in developed economies. The Plastic Waste Management Rules, 2016, mandate waste collection and restrict open incineration.

Air Pollution

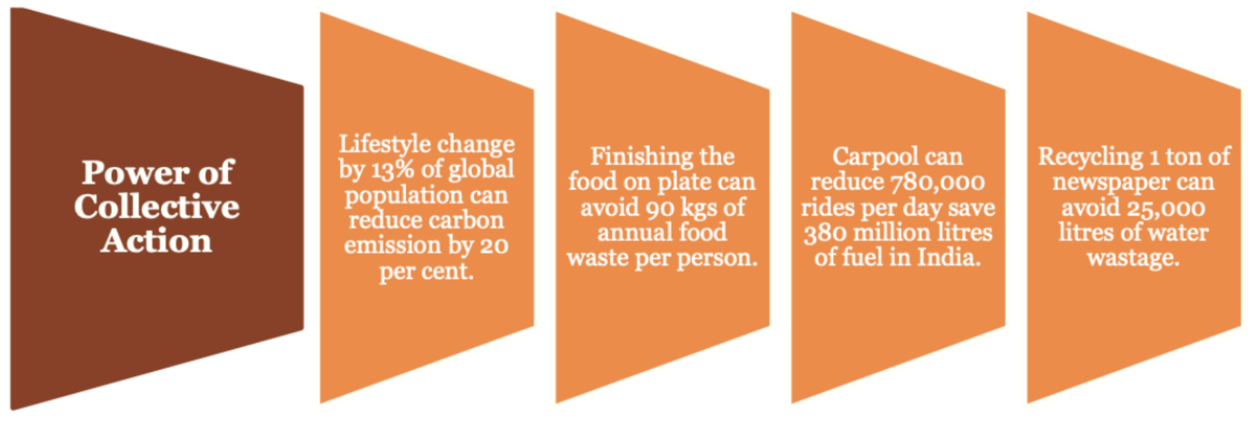
- **National Clean Air Programme (NCAP)**: Launched in 2019 to reduce air pollution in 130 non-attainment cities. The Graded Response Action Plan (GRAP) imposes preventive measures based on air quality index (AQI) levels.
- **Stubble Burning**: Financial assistance is provided to farmers in Punjab, Haryana, Uttar Pradesh, and Delhi for crop residue management machinery to reduce stubble burning.

Conclusion

- **Net Zero by 2070**: India's long-term goal is to achieve net-zero emissions by 2070 while ensuring economic growth, energy security, and environmental sustainability.

- **Adaptation and Mitigation**: A holistic approach is needed, focusing on resilient infrastructure, R&D in climate technologies, and mobilising financial resources for adaptation.

Chart X.7: Harnessing the Power of Collective Action for Environment



Source: Prepared internally based on the NITI Report titled 'Lifestyle for Environment (LiFE): A global mass movement to promote climate-friendly behaviours among individuals'. (https://tinyurl.com/4wzvb4xt)

- **Renewable Energy Challenges:** Investments in battery storage, grid infrastructure, and critical minerals are essential for scaling up renewable energy.
- **LiFE Mission:** Promoting low-carbon lifestyles through awareness campaigns and integrating LiFE principles into education can drive sustainable development.

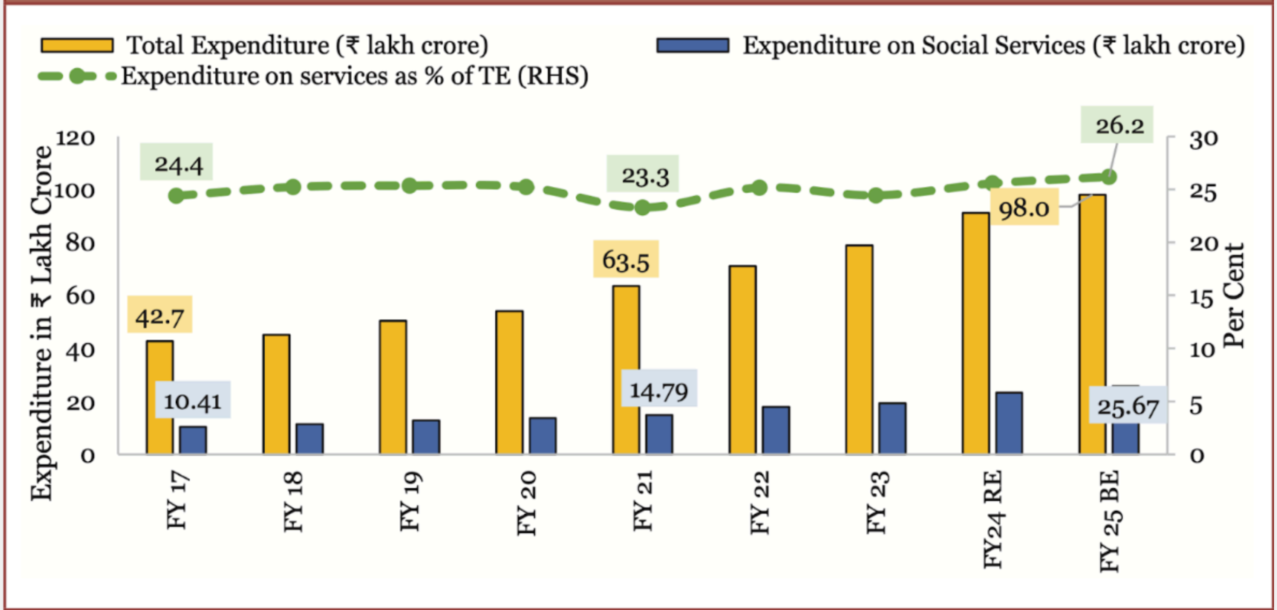
SOCIAL SECTOR:

EXTENDING REACH & DRIVING EMPOWERMENT

Introduction

- **Inclusive Growth**: Economic growth must be inclusive to ensure welfare through education, healthcare, skill development, and infrastructure.
- **Interdependence of Policies**: Effective policies must consider the interplay of education, healthcare, and social security to improve citizens' welfare.

Chart XI.1: Trends in social service sector expenditure by government (combined Centre and States)



Education

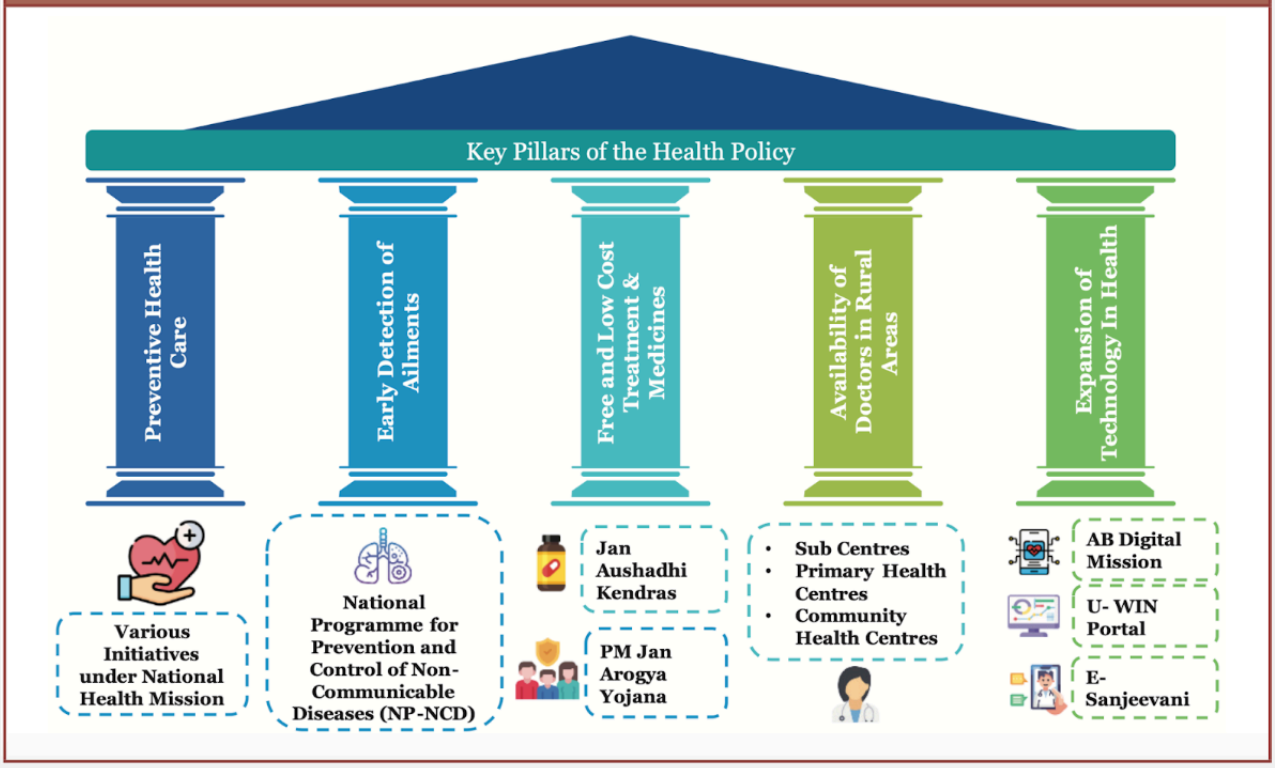
- **Education System:** India's education system serves 24.8 crore students with 98 lakh teachers, and aims for a 100% Gross Enrolment Ratio (GER) by 2030.
  - GER: Primary education is near 93%, secondary is 77.4%, and higher secondary is 56.2%.
- **National Education Policy (NEP) 2020**: This policy promotes inclusivity, aims to produce engaged and productive citizens, and integrates social-emotional learning (SEL) with digital literacy.
- **Programmes Supporting Education**: Various initiatives like Samagra Shiksha Abhiyan, DIKSHA, and PM SHRI are in place to enhance education quality and accessibility.

Healthcare

- **Total Health Expenditure (THE):** ₹9,04,461 crore in FY22 (3.8% of GDP), up from ₹7,98,920 crore in FY21.

- **Government Health Expenditure (GHE)**: Increased from 29% in FY15 to 48% in FY22, reducing household out-of-pocket expenditure (OOPE) from 62.6% to 39.4% during the same period.
- **Ayushman Bharat (AB-PMJAY)**: Over ₹1.25 lakh crore in savings and 25 lakh beneficiaries in dialysis schemes.

Chart XI.5 Key pillars of health policy[92]

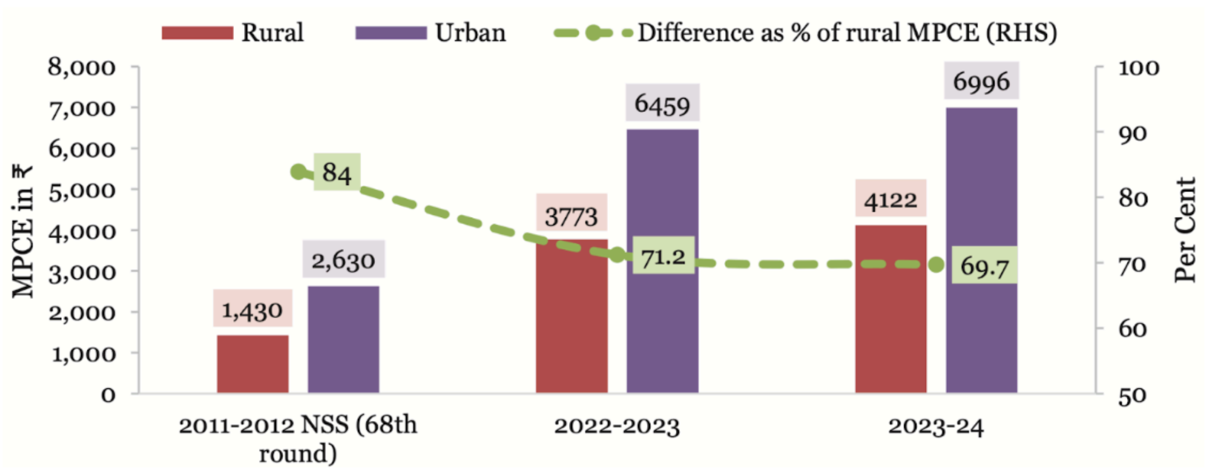


- **Non-Communicable Diseases (NCDs)**: NCDs like cardiovascular diseases, cancers, chronic respiratory diseases, and diabetes account for 61.8% of deaths, with efforts to combat these through screening and preventive programmes.
- **Government Schemes**: Programs such as the Free Dialysis Scheme and the AB-PMJAY focus on providing affordable healthcare.

Rural Economy

- **Consumption and Income: Welfare** initiatives like direct cash transfers and loans through Self-Help Groups (SHGs) have empowered poorer households, raising consumption.
- **SHG Impact**: Loans are used for household consumption (34%), health expenditure (22%), business start-ups (19%), and agricultural spending (19%).
- **Infrastructure**: Rural areas are benefiting from improving infrastructures such as roads, housing, and education.

Chart XI.3. Declining urban-rural gap in consumption



Source: HCES 2023-24, MoSPI

Table XI.6: Progress of Rural infrastructure development schemes

Roads	Pradhan Mantri Gram Sadak Yojana (PMGSY) (as of 9 January 2025)[171] • 8,34,695 km of road length sanctioned. • 7,70,983 km of road length completed. • 99.6 per cent of the targeted habitations provided connectivity.
Housing	**2.69 crore houses** completed since 2016 under **Pradhan Mantri Awaas Yojana-Gramin (PMAY-G).**[172]
Water bodies	**68,843 *Amrit Sarovars*** (ponds) constructed under Mission Amrit Sarovar.[173]
Health Infrastructure National Health Mission[174] (Figures in '000s.)	165.6 Sub-centres (SCs); 25.4 Primary Health Centres (PHCs); 5.5 Community Health Centres (CHCs) 32.9 Doctors at PHCs; 4.4 Total Specialists at CHCs; 79.3 Nursing Staff at PHCs & CHCs; 27.7 Pharmacists at PHCs & CHCs; 23.2 Lab Technicians at PHCs & CHCs
Drinking Water	**12.2 crore households** provided with tap water connections under Jal Jeevan Mission (as of 27 January 2025).[175]

Technology Integration

- **AI in Healthcare**: AI helps improve diagnosis accuracy, reduce drug discovery costs, and provides real-time monitoring of remote patients.
- **Drones for Healthcare**: Initiatives like 'Medicines from the Sky' in Telangana and Arunachal Pradesh deliver medicines using drones, reducing delivery times dramatically.
- **Tele-MANAS**: A mobile platform offering mental health consultations and support.

Mental Health

- **Mental Health Initiatives:** India is prioritising mental health with government schemes, including Tele-MANAS, aimed at providing accessible mental health services.
- **Workplace and Lifestyle**: Addressing lifestyle choices and workplace culture are crucial to improving mental well-being, which affects productivity.

Social Sector and Inequality

- **Income Distribution**: Social sector initiatives have reduced inequality, evidenced by a declining Gini coefficient in both rural (0.237) and urban (0.284) areas, alongside a narrowing rural-urban consumption gap.
- **PDS Impact**: The Public Distribution System (PDS) benefits 84% of the population, providing significant welfare to low-income households.

Sustainable Development Goals (SDGs)

- **SDG Localisation**: Kerala serves as a model for SDG localisation, integrating SDG goals into local planning through data-driven decision-making.
- **State Participation**: 10 states and UTs are working through SDG Coordination Centres to implement SDGs by aligning state budgets and policies with SDG objectives.

Key Data Figures

- **Total Health Expenditure (THE)**: ₹9,04,461 crore (3.8% of GDP) for FY22.
- **Government Health Expenditure (GHE)**: Increased from 29% to 48% of total health expenditure.
- **Ayushman Bharat Impact**: ₹1.25 lakh crore savings from reduced OOPE.
- **MPCE in 2023-24**: Rural ₹4,122, Urban ₹6,996; the rural-urban gap narrowed from 84% in 2011-12 to 70% in 2023-24.
- **NCD Screening**: 39.8 crore individuals screened for diabetes, hypertension, and cancers.

EMPLOYMENT & SKILL DEVELOPMENT: EXISTENTIAL PRIORITIES

India's labour market is at a pivotal juncture, balancing the opportunities of a demographic dividend with the challenges of creating quality jobs and ensuring inclusive growth. It provides a comprehensive overview of the strides made and the road ahead. While the report highlights significant progress, it also underscores the need for strategic reforms and targeted interventions to address persistent gaps. Here's a critical analysis of the chapter, weaving in key takeaways and offering an opinionated perspective.

Improving Labour Market Indicators

- **Declining Unemployment**: The unemployment rate has steadily declined, supported by rising labour force participation and worker population ratios. This is a testament to India's post-pandemic recovery and the resilience of its workforce.
- **Formalisation of Jobs**: EPFO data shows a doubling of net payroll additions from FY19 to FY24, indicating a shift towards formal employment. However, the informal sector still employs a significant portion of the workforce, highlighting the need for broader formalisation efforts.

While the decline in unemployment is commendable, the quality of jobs remains a concern. Many new jobs are in low-paying, informal sectors, which do not provide sustainable livelihoods or social security. The focus should shift from mere job creation to creating quality jobs with fair wages and benefits.

Harnessing the Demographic Dividend

- **Working-Age Population**: With 65% of the population under 35, India has a unique opportunity to leverage its demographic dividend for economic growth.
- **Dependency Ratio**: A declining dependency ratio presents an opportunity for higher productivity and economic expansion.

The demographic dividend is a double-edged sword. Without adequate job creation and skill development, it could turn into a demographic disaster. The government must act swiftly to align education and skilling programs with industry needs to ensure that the youth are employable.

Job Creation and Skill Development

- **Government Initiatives:** Programmes like Skill India, Start-Up India, and Mudra Yojana have fostered entrepreneurship and employment. Over 1.24 crore individuals have been trained under ITIs and PMKVY schemes.

- **Reskilling and Upskilling**: Emphasis on aligning the workforce with global demands through reskilling and upskilling is crucial.

These initiatives are laudable, their impact remains uneven. Many skilling programs suffer from low placement rates and a mismatch between training and industry requirements. There is an urgent need for greater industry collaboration to ensure that skilling programmes are demand-driven.

Women's Workforce Participation

- **Rising FLFPR**: Female Labour Force Participation Rate (FLFPR) has grown significantly, particularly in rural areas. Women dominate traditional sectors like khadi (80%) and handloom (72%).
- **Digital Inclusion**: Initiatives like the Women Economic Empowerment (WEE) programme aim to integrate women into the digital economy, impacting 2.5 lakh women by 2025.

The rise in FLFPR is encouraging, women's participation remains disproportionately low in high-paying, formal sectors. Addressing structural barriers such as wage gaps, lack of childcare facilities, and societal norms is essential for true gender inclusion.

Emerging Sectors Driving Employment

- **Digital Economy and Renewable Energy**: These sectors hold immense potential for high-quality job creation. For instance, the Solar Urja Lamps Project has trained women in Rajasthan, providing sustainable livelihoods.
- **Green Jobs**: The transition to renewable energy is expected to generate significant employment opportunities.

Emerging sectors offer hope, their contribution to employment is still nascent. Scaling up these sectors requires substantial investment, policy support, and infrastructure development. Additionally, the benefits of these jobs must reach marginalised communities, including women and rural populations.

Labour Market Reforms

- **Simplified Compliance:** Labour law reforms aim to simplify compliance, promote flexibility, and protect worker rights.
- **Social Security for Gig Workers**: The Code on Social Security, 2020, provides welfare measures like insurance and maternity benefits for gig and platform workers.

Labour reforms are a step in the right direction, their implementation remains patchy. Many workers, especially in the informal sector, are still excluded from social security benefits. Strengthening enforcement mechanisms is critical to ensuring that reforms translate into tangible benefits for workers.

International Mobility of Skilled Workers

- **Global Demand**: By 2025, an estimated 97 million new jobs will emerge worldwide in sectors like healthcare, IT, and construction.
- **India's Diaspora**: With 32 million diaspora members, India has the potential to become a global talent hub.

India's demographic advantage is undeniable, its skilling ecosystem must align with global job market demands. Regular demand-supply analyses and international collaborations are essential to maximise opportunities for Indian workers abroad.

LOOKING FORWARD

While this survey paints a hopeful picture of India's labour market, highlighting significant progress in reducing unemployment, formalising jobs, and increasing women's participation. However, the report also reveals critical gaps that must be addressed to ensure sustainable and inclusive growth. The focus on skilling and job creation is commendable, but the quality of jobs remains a pressing concern. Many workers, especially in the informal sector, continue to face low wages, job insecurity, and lack of social security. The government must prioritise creating quality jobs that provide sustainable livelihoods and fair working conditions.

Women's workforce participation, while improving, is still far from ideal. Structural barriers such as wage gaps, lack of childcare, and societal norms must be dismantled to achieve true gender inclusion. Emerging sectors like the digital economy and renewable energy offer immense potential, but their benefits must reach marginalised communities. Labour reforms are a step in the right direction, but their implementation must be strengthened to ensure that all workers, including those in the informal sector, reap the benefits. Finally, India's demographic dividend is a golden opportunity, but it must be harnessed through strategic investments in education, skilling, and industry collaboration.

In conclusion, while India's labour market has made significant strides, the road ahead is fraught with challenges. A collaborative approach involving the government, industry, and civil society is essential to navigate these challenges and unlock India's full potential as a global economic powerhouse. The vision of Viksit Bharat can only be realised if every worker, regardless of gender or socio-economic background, has access to quality jobs and opportunities for growth.

LABOUR IN THE AI ERA:
CRISIS OR CATALYST?

Introduction

- **AI's Rapid Advancement**: Artificial Intelligence (AI) presents both opportunities and challenges for global labour markets. Policymakers must address the potential disruptions caused by AI, particularly in entry-level jobs.
- **India's Demographic Advantage**: India's young and diverse workforce positions it uniquely to benefit from AI, but this requires significant investments in education and skilling.
- **Inclusive Institutions**: Historical technological revolutions highlight the importance of inclusive institutions to manage disruptions and ensure equitable outcomes.
- **Lifestyle for Environment (LiFE)**: India's LiFE initiative aims to promote sustainable practices and a circular economy, aligning AI-driven innovation with societal goals.

AI's Impact on Labour Markets

- **Job Displacement Concerns**: AI is expected to outperform humans in decision-making processes in healthcare, criminal justice, education, and financial services. Estimates suggest that 75 million jobs globally are at risk of automation due to AI.
- **Global Estimates**:
    - **Goldman Sachs**: 300 million full-time jobs are exposed to AI-driven automation.
    - **McKinsey**: By 2030, up to 30% of current work hours could be automated by generative AI in Europe and the US.
    - **Ernst & Young**: 57% of occupations in emerging economies could be affected by AI adoption.
- **India's Vulnerability**:
    - **IIM Ahmedabad Survey**: 68% of Indian white-collar workers expect their jobs to be partially or fully automated by AI within five years.
    - **RBI Study**: Indian banks are increasingly adopting AI, with the AI market expected to grow at 25-35% CAGR by 2027.

Lessons from Past Technological Revolutions

- **Historical Disruptions**: Previous technological revolutions, such as the Industrial Revolution, led to prolonged unemployment and income inequality. For example, during the Industrial Revolution, wages lagged behind productivity gains, leading to "Engel's pause."
- **Societal Impact**: Technological advancements often exacerbate economic disparities if not managed by robust institutions. For instance, the energy transition in the US led to significant job losses in coal mining.

- **India’s Challenge**: India must create 78.5 lakh jobs annually in the non-farm sector by 2030 to meet workforce demands. The services sector, which is highly susceptible to automation, is a key area of concern.

The Need for Robust Institutions

- **Enabling Institutions**: These institutions focus on equipping the workforce with future-ready skills, ensuring smooth transitions to new jobs, and preventing long-term unemployment.
- **Insuring Institutions**: These provide safety nets, such as unemployment benefits, housing, and social support, to cushion the impact of labour market disruptions.
- **Stewarding Institutions**: These institutions ensure that AI applications align with societal values, promoting transparency and accountability. They are crucial for mitigating risks and fostering social acceptability of AI.

Challenges in AI Adoption

- **Practicality vs. Breakthrough**: AI is still in its experimental phase, with many applications lacking real-world practicality. For example, self-driving cars and AI chatbots face challenges in cost-effectiveness and social acceptability.
- **Reliability Issues**: AI models often produce errors or “hallucinations,” making them unreliable for critical applications. For instance, AI in recruitment has shown bias against female candidates, and predictive policing algorithms have been biased against minorities.
- **Infrastructure Challenges**: AI adoption requires significant infrastructure, including data centres, reliable chip supply, and clean data. Building this infrastructure is time-consuming and resource-intensive.
- **Resource Efficiency**: Training AI models is becoming increasingly expensive. For example, training OpenAI’s GPT-4 cost US $78.4 million, while Google’s Gemini Ultra cost US $191.4 million. AI’s energy and water consumption also pose significant challenges.

AI and India: Opportunities

- **Labour-Augmenting Potential**: AI can enhance productivity rather than replace jobs. For example, AI assistants in customer support have increased productivity by 14%, with a 34% improvement for lower-skilled workers.
- Human-AI Collaboration: In fields like scientific research, AI can assist in hypothesis generation, data collection, and error auditing, enhancing human capabilities.
- **Services Sector Growth**: India’s services-driven economy offers opportunities for AI to augment productivity, particularly in sectors like finance, healthcare, and retail.

Demand Elasticities and Employment

- **Demand Elasticities**: Sectors with high demand elasticity, such as financial services (1.86), health and social work (1.3), and retail trade (1.2), are more likely to see employment growth due to AI-driven productivity gains.
- **Low Elasticity Sectors**: Sectors like education (0.77) and post and telecom (0.32) may see limited employment growth or even job displacement due to automation.

Conclusion

- **Institution Building**: India must focus on building robust institutions to manage the transition to an AI-driven economy. This includes enabling, insuring, and stewarding institutions to ensure equitable outcomes.
- **Corporate Responsibility**: The private sector must adopt AI responsibly, balancing innovation with social impact. Premature AI adoption without adequate safeguards could lead to significant economic and social costs.
- **Tripartite Compact**: Collaboration between the government, private sector, and academia is essential to ensure that AI-driven productivity gains are widely distributed, fostering inclusive growth.

“May all be happy; May all be without disease; May all have well-being; May none have the misery of any sort”

~ Brihadaaranyaka Upanishad

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