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Content

Strengthening India'S Fiscal Foundations for Viksit Bharat 2047

This editorial is based on "The case for states to adopt fiscal reforms" which was published in The Hindustan Times on 28/12/2025. The article examines India's growth story and highlights the need for fiscal consolidation to sustain the long term growth rate.

India's ambition to sustain high growth and achieve developed-nation status by 2047 hinges on strengthening fiscal discipline across both the Centre and the states. While the Centre has reduced its **fiscal deficit from 9.2% to 5.6% and public debt from 89% to about 82% of GDP**, state-level fiscal reforms remain uneven. Global investors assess **India's *general government* finances,** making coordinated fiscal governance essential. Adopting deeper fiscal reforms at the state level, anchored in debt sustainability and accountability, is thus critical to ensure long-term macroeconomic stability and inclusive growth.

What is India's Current Fiscal Governance Framework?

- **Fiscal Policy:** Fiscal policy refers to the **government's use of taxation, public expenditure, and borrowing** to influence the economy.
  - It is a key tool through which the government regulates **economic growth, employment, inflation, income distribution, and overall macroeconomic stability**.
  - It operates through two major components **Revenue Policy** (taxation and non-tax revenues) and **Expenditure Policy (**capital and revenue spending**)**
  - **India's fiscal policy is defined by a strategy of "Growth with Consolidation."** The government is currently focused on reducing the fiscal deficit while maintaining high levels of capital expenditure (spending on infrastructure) to drive long-term economic growth.
    - **Fiscal policy differs from monetary policy** which is administered by the central bank to regulate money supply and interest rates.
- **Constitutional Framework for Union:** The framework is primarily drawn from **Part V (The Union) and Part XII (Finance, Property, Contracts and Suits)** of the Constitution.
  - **Budgetary Process (Union Level):** The Constitution does not use the word "Budget." Instead, it refers to it as the Annual Financial Statement.
    - **Article 112:** Requires the President to present Parliament with annual estimates of receipts and expenditure.
    - **Article 113:** Mandates Lok Sabha approval of expenditure from the Consolidated Fund through Demands for Grants, excluding charged expenditure.
    - **Article 114 (Appropriation Act):** Prohibits withdrawal from the Consolidated Fund without parliamentary sanction.
    - **Article 110 (Finance Bill):** Classifies taxation proposals as Money Bills, forming the legal basis for tax changes.
  - **The Three Public Funds**: The Constitution establishes three key public accounts:
    - **Consolidated Fund of India (Art. 266(1))**: Primary account for government revenues and expenditures.
    - **Public Account of India (Art. 266(2)):** Funds held in trust by the government; withdrawals do not require parliamentary approval.
    - **Contingency Fund of India (Art. 267):** Emergency fund to meet unforeseen expenses pending legislative authorization.
  - **Fiscal Federalism (Centre–State Relations):** The Constitution ensures cooperative fiscal relations between the Union and States.
    - **Article 280 (Finance Commission):** Recommends vertical and horizontal tax devolution every five years.

- **Article 279A (GST Council):** Institutional forum for joint decision-making on GST matters.
- **Grants-in-Aid:**
  - **Article 275:** Statutory grants based on Finance Commission recommendations.
  - **Article 282:** Discretionary grants for public purposes.
- Control over Taxation
  - **Article 265:** Mandates that taxation must have legislative authority.
  - **Seventh Schedule:** Allocates taxing powers between the Union and States through Union and State Lists.

- **Constitutional Framework for States:** The constitutional framework for the States mirrors that of the Union but is tailored for regional governance.
  - The State Budgetary Process
    - **Article 202 (Annual Financial Statement):** Just like the Union, the Governor must lay the estimated receipts and expenditure of the State before the Legislature every year.
    - **Article 203 & 204:** These ensure that no money is spent without a Demand for Grant voted by the Legislative Assembly and the subsequent passing of an Appropriation Bill.
    - **Article 199:** Defines Money Bills at the state level (specifically for taxes and borrowing), giving the Legislative Assembly (Lower House) supreme power over the Legislative Council (Upper House).
  - **State Funds & Custody:** The States maintain three funds identical in nature to the Union's:
    - **Consolidated Fund of the State (Article 266):** Where all state taxes and revenues are deposited.
    - **Public Account of the State (Article 266):** For transactions where the state acts as a banker (e.g., state provident funds).
    - **Contingency Fund of the State (Article 267):** An emergency fund at the disposal of the Governor for unforeseen expenses.
  - **Power to Tax & Borrow**
    - **Seventh Schedule (List II):** Grants States exclusive power to tax specific items, including:
    - Agricultural income.
    - Land and buildings.
    - Alcohol for human consumption.
    - **Electricity, vehicles, and entertainment.**
  - **Article 293 (Borrowing):** A State can borrow money within India. However, if the State still owes any money to the Union Government, it must obtain the Union's consent before raising a new loan.
  - **Fiscal Devolution**
    - **Article 243-I & 243-Y (State Finance Commission):** Every five years, the Governor constitutes a State Finance Commission to recommend how the state's revenue should be shared with Panchayats and Municipalities.

- **Legal Framework:** India's fiscal legal framework operationalises constitutional principles through key parliamentary laws governing deficits, debt, and taxation.
  - **The FRBM Act, 2003** anchors fiscal discipline via deficit targets, a debt-to-GDP framework, and mandatory fiscal disclosures; following this, most States enacted their own FRBM Acts.
    - A key provision of the FRBM Act is the requirement for the CAG to carry out an annual compliance review of the Act.
    - It also mandates that the government present three statements to Parliament along with the Budget: the **Macro-economic Framework Statement, the Medium-Term Fiscal Policy Statement, and the Fiscal Policy Strategy Statement.**
  - **The Income-tax Act, 2025 (effective April 2026)** modernises direct taxation by simplifying provisions and making the new tax regime the default. Indirect taxation is governed by the **GST Laws of 2017,** with recent reforms strengthening compliance and addressing post-pandemic state revenue challenges.

What is the Current Status of India's Fiscal Consolidation Targets?

- **Fiscal Deficit:** The Government of India has set a fiscal deficit target of **4.4% of GDP** for FY 2025–26, down from the revised estimate of **4.8% of GDP in FY 2024–25**. This reflects continued fiscal consolidation efforts under the FRBM framework.
- **Revenue Deficit and Other Indicators:** For FY 2025–26, the **revenue deficit** is projected at **1.5% of GDP**, lower than the revised estimate of 1.9% for FY 2024–25. The **primary deficit** is also expected to narrow, indicating improved balance after accounting for interest payments.
- **Debt Targets:** The Union Budget 2025 recognized the need to shift focus from rigid deficit targets to **managing the debt-to-GDP ratio**, with an aim to gradually reduce overall liabilities.
  - Outstanding central government liabilities were estimated at around **56.1% of GDP in FY 2025–26** and a target has been set to bring this down towards **around 50% of GDP by FY 2030–31**.
- **State's Fiscal Status:** The combined **debt-to-GDP ratio of states** declined from about **31% of GDP in March 2021 to 28.5% by March 2024**, although this is still above the pre-pandemic level of 25.3%.

What are the Key Issues Associated with Fiscal Management in India?

- **High Interest Burden and Debt Servicing:** A significant portion of India's revenue is consumed by interest payments on past borrowings, leaving limited room for social sector spending.
  - While the **debt-to-GDP ratio is gradually declining,** the absolute volume of interest remains a "committed expenditure" that creates fiscal rigidity.
  - **Interest payments act as a massive "crowding out" factor, consuming nearly 25% of the total budget** and restricting the government's ability to fund health and education.
    - In the **FY 2025–26 Budget,** interest payments were projected to account **for nearly 37%** of the Union government's **total revenue receipts.**
- **Elevated Fiscal Deficit and Slower Consolidation**: Despite efforts at fiscal consolidation, the fiscal deficit remains high. For FY 2025-26, the fiscal deficit target is set at 4.4% of GDP, **but progress is gradual and pressures persist.**
  - Recent data shows that **by April–November 2025, the fiscal deficit had already reached 62.3% of the full-year target** (₹9.76 lakh crore), higher than the same period last year, **indicating ongoing pressures on revenue and expenditure management**.
- **High Public Debt Burden:** India's general **government debt (Centre + States)** remains significant. In the **Union Budget 2025–26**, total central government debt was estimated at around 56.1% of GDP.
  - While there is an aim to reduce this over time, **the current level still constrains fiscal space for growth-enhancing expenditure.**
- **States' Fiscal Stress and Debt Sustainability** : State finances show persistent stress. According to a recent PRS India report drawing on RBI and state budget data, states **collectively had outstanding liabilities of about 27.5% of GDP in 2023–24, exceeding the long-term target of 20% of GDP**.
  - 19 states had **fiscal deficits above the 3% of GSDP norm** in 2023–24. Several states (e.g., Andhra Pradesh, Punjab, Tamil Nadu) continue to struggle with structural imbalances.
  - Higher debt levels have led to high interest payment obligations across states. Interest payments grew at an annual rate of 10% between 2016-17 and 2024-25, faster than revenue receipts growth of 9.2%.
- **Committed Expenditure Crowding Out Development Spending** : A significant portion of government budgets goes towards committed and non-discretionary expenditures (salaries, interest payments, subsidies).
  - For states in 2023–24, **over 53% of revenue receipts were spent on salaries, interest and pensions**, severely limiting the fiscal room for capital outlays and productive investment.

- **Centre–State Coordination and FRBM Implementation Gaps:** Although the **FRBM framework provides fiscal rules,** both Centre and states have seen frequent slippages and temporary relaxations.
  - States often rely on special borrowing provisions and carry forward unutilised borrowing space due to weaker revenue mobilisation and higher committed spending.
- **Weak Revenue Mobilisation and Tax Buoyancy Challenges**: India's **tax-to-GDP ratio** remains relatively low compared with many advanced economies and even some emerging markets, constraining its ability to finance expanding developmental and welfare commitments without increased borrowing.
  - According to **World Bank data**, India's tax revenue was only about **6.73% of GDP in 2022** when measured at the central level, reflecting a modest tax share relative to economic output.
  - When combined with state tax collections, India's overall tax-to-GDP ratio is typically estimated in the range of **11–12% of GDP** in recent years, which is significantly lower than the **OECD average tax-to-GDP ratio of over 34%**, highlighting the gap in revenue mobilisation capacity.
  - Low tax buoyancy, further complicates fiscal planning; analysts suggest India needs a **tax buoyancy of 1.2 to 1.5 to support medium-term growth targets (6.5 to 7%)**, underlining the need for structural reforms to broaden the base and improve compliance.

What Measures are Needed to Strengthen Fiscal Management in India ?

- **Strengthening Fiscal Consolidation and Credible Medium-Term Targets:** To address persistently high fiscal deficits, India must adhere to a **credible medium-term fiscal consolidation path anchored in debt reduction rather than only annual deficit targets.**
  - The proposed shift towards a **debt-to-GDP anchor (around 50% by 2030–31)** should be operationalised through clear glide paths for both the Centre and States.
  - Improved **transparency in off-budget borrowings and stricter adherence to FRBM limits**, except under well-defined escape clauses, will enhance fiscal credibility and investor confidence.
  - **NITI Aayog released the Fiscal Health Index (FHI) Report 2025** to assess sub-national fiscal health and should be utilized to design targeted fiscal reforms for sustainable and resilient economic growth.
- **Managing Public Debt and Enhancing Debt Sustainability:** Given that general government debt remains elevated, the focus must shift to active debt management.
  - This includes lengthening **debt maturity profiles, reducing interest costs through better timing of issuances**, and improving coordination between the Centre and States in market borrowings.
  - Strengthening the role of the **RBI's debt management framework** and developing **deeper bond markets** can help lower refinancing risks and improve fiscal resilience.
- **Addressing State-Level Fiscal Stress:** States require a calibrated mix of incentives and discipline. The Centre should link **additional borrowing space to measurable fiscal reforms (power sector reforms, subsidy rationalisation, asset monetisation**).
  - Encourage adoption of **medium-term fiscal frameworks** at the state level. And promote **transparent reporting of off-budget borrowings and guarantees**.
  - Further strengthening state capacity for revenue mobilisation and expenditure prioritisation is essential to prevent persistent debt accumulation.
- **Containing Committed Expenditure and Improving Spending Quality:** To address this, the government needs to rationalise subsidies through better targeting, especially by expanding **Direct Benefit Transfer (DBT)** mechanisms that reduce leakages and ensure benefits reach intended beneficiaries.

- At the same time, greater priority must be given to **capital expenditure** such as infrastructure, logistics, and digital assets, **which has a higher multiplier effect** on economic growth and employment compared to revenue expenditure.

- **Enhancing Revenue Mobilisation and Tax Buoyancy:** Improving revenue mobilisation requires structural reforms rather than frequent tax rate increases. **Broadening the tax base, improving compliance, and leveraging digital tools such as data analytics and AI can significantly improve tax collection efficiency.**
  - Strengthening the GST framework through rate rationalisation, simplification of compliance procedures, and plugging leakages is essential to enhance tax buoyancy.
  - Additionally, **expanding the direct tax base by formalising the informal economy** and improving income reporting will help raise India's tax-to-GDP ratio and reduce dependence on borrowing for financing development needs.
- **Strengthening Centre–State Fiscal Coordination:** Effective fiscal management in a federal system requires close coordination between the Centre and the States. Regular and structured Centre–State consultations beyond the Finance Commission cycle can help align fiscal priorities and manage macroeconomic risks.
  - **Harmonising borrowing norms and fiscal rules across states** will promote discipline and reduce imbalances.
  - Greater transparency in state finances, through standardised accounting and real-time reporting systems, will also improve oversight and trust between different levels of government.
- **Improving Institutional Capacity and Fiscal Governance:** Strong institutions are essential for sustainable fiscal management. Enhancing the technical and analytical capacity of finance departments and treasuries will improve budgeting, forecasting, and policy evaluation.
  - **Independent fiscal institutions** can play a vital role in monitoring compliance with fiscal rules and providing objective assessments of public finances.
  - Wider adoption of **outcome-based budgeting and data-driven decision-making** will ensure that public spending delivers measurable results and long-term value for the economy.

Conclusion:

India's fiscal sustainability hinges on strengthening revenue mobilisation, rationalising expenditure, and adhering to a credible consolidation path. With the goal of reducing the fiscal deficit to around **4.4% of GDP** and lowering public debt towards **50% of GDP by 2030–31**, disciplined fiscal management is essential. Enhancing capital expenditure, improving tax buoyancy, and strengthening Centre–State coordination will be critical to sustaining high growth. Robust institutions and transparent fiscal governance must support these reforms. Together, these measures are vital for achieving India's vision of becoming a **developed nation by 2047**.

Gig Economy- Balancing Growth With Worker Protection

This editorial is based on "Gig workers' strike reveals intolerable working conditions" which was published in The Hindu on 01/01/2026. The article highlights, for the first time, a nationwide collective assertion by gig workers demanding dignity, regulation, and accountability in India's platform economy.

India's gig economy has emerged as a major feature of its labour market, with an estimated **7.7 million workers engaged in platform-based work in 2020-21**, expected to grow towards **23.5 million by 2029-30**. The recent nationwide **New Year's Eve strike** by tens of thousands of app-based delivery and transport workers has starkly revealed the **harsh realities behind the convenience economy-long hours, low pay, and unsafe conditions.** This protest highlights how crucial gig workers have become to everyday urban services across India. At the same time, it underscores regulatory gaps that leave these millions without basic rights or protections. The gig economy now stands at a crossroads between rapid expansion and the urgent need for labour justice.

What is the Gig Economy?

- **About:** The **gig economy** refers to a labour market where work is performed through **short-term, flexible, and task-based engagements** rather than traditional full-time employment.
  - In this system, individuals often called **gig or platform workers**, earn income by providing services such as food delivery, ride-hailing, logistics, freelance work, or home services through **digital platforms** like **Uber, Swiggy, Zomato, Urban Company, or Ola.**
- **Status of the Gig Economy in India**: India's gig economy has grown significantly in recent years, with an estimated **12 million gig workers by FY 2024-25**, up from around **7.7 million in 2020-21**.
  - This segment now makes up **over 2% of the total workforce** and is expanding due to digital connectivity, urbanisation, and the rise of on-demand services like food delivery and ride-hailing.
  - According to government estimates, the number of gig and platform workers could rise to **about 23.5 million by 2029-30**, representing a larger share of India's non-agricultural workforce.
  - **Union Budget 2025** introduces **identity cards and healthcare benefits** for gig workers, ensuring better social security and financial inclusion.
- **Regulation in India:** The Code on Social Security (2020) **formally recognised gig and platform workers** and allowed for social security schemes, but **enforceable standards on wages, working hours, grievance redressal, and algorithmic accountability remain weak or unimplemented**.
  - States like **Rajasthan and Karnataka** have passed welfare legislation, though implementation is lagging.
  - **Draft rules under the Social Security Code,** released in January 2026 propose that gig and platform workers must be engaged with an aggregator for at least **90 days** in a financial year to qualify for social security benefits established by the Centre.
    - For those working with more than one aggregator, the required period increases to **120 days.**

How does the Gig Economy Contribute to India's Development Journey?

- **Employment Generation & Youth Absorption:** The gig economy provides **livelihoods to over 7–8 million workers** (projected to reach **23.5 million by 2030**), absorbing surplus labour from agriculture and informal sectors.
  - It plays a crucial role in **urban employment**, especially for youth, migrants, and semi-skilled workers, thereby reducing open unemployment.
- **Boost to Services Sector & GDP:** Gig platforms significantly contribute to the **services sector**, which accounts for over **55% of India's GDP**.
  - Sectors such as **ride-hailing, food delivery, logistics, e-commerce, home services, and digital freelancing** have expanded rapidly, supporting service-consumption driven growth.
- **Promotion of Digital Economy & Innovation:** Gig platforms accelerate **digitalisation**, cashless payments, GPS-based logistics, and AI-driven service delivery.
  - They support India's Digital Public Infrastructure **(DPI)** ecosystem—UPI, Aadhaar, and mobile connectivity—enhancing economic efficiency and formalisation.
  - With this, India's digital economy is expected to grow almost twice as fast as the overall economy, contributing to **nearly one-fifth of national income by 2029-30**.
- **Support to MSMEs and Entrepreneurship**: Gig platforms enable **micro-entrepreneurship** by lowering entry barriers, **workers can earn with minimal capital investment.**

- Small businesses and MSMEs benefit from last-mile delivery, digital marketing, and logistics support.
- It enhances labour market flexibility by allowing workers to choose their hours and diversify income sources, while also absorbing displaced workers during economic shocks such as the post-COVID recovery.

- **Driving Female Labor Force Participation (FLFPR):** Platform-based work **dismantles traditional "9-to-5" barriers,** allowing women to balance domestic responsibilities with income generation through flexible, often home-based, digital tasks.
  - By providing a **safe and autonomous environment,** the gig economy is the **primary driver behind the recent surge in urban and peri-urban female employment.**
  - India's FLFPR has seen a notable uptick **with women making up approximately 28% of the gig workforce.**
    - Platforms like Urban Company and various **"beauty-at-home" services** have empowered thousands of women to earn 40-50% more than traditional salon roles.
- **Engine for Regional Economic Decentralization:** The aggressive expansion of "Quick Commerce" **and logistics into Tier-2 and Tier-3** cities is decentralizing economic growth away from saturated metros like Bengaluru and Delhi.
  - For instance, in 2025-26, **India's Q-Commerce market surged to ₹64,000 crore**.
  - By utilizing a **"Dark Store" model** and AI-driven route optimization, the gig economy converts latent urban demand into immediate economic activity, fueling a cycle of high-frequency consumption.
    - This shift creates localized job hubs, preventing distressed migration and stimulating **"hyper-local"** economies through increased consumption and **last-mile delivery networks**.
  - **In 2026, an estimated 20 lakh (2 million) new gig jobs are expected**, primarily driven by the expansion of platforms like Blinkit and Zepto into smaller cities. During the 2025 festive season, these platforms reported a massive **120% surge in orders, directly boosting rural and semi-urban incomes.**
- **Catalyst for Structural Transformation and Formalization:** The gig economy acts as a **"formalization bridge"** by pulling millions of unregistered manual laborers into a digital ecosystem that tracks income, skills, and work history.
  - This transition provides the government with granular data to design targeted welfare schemes, effectively **reducing the historical "invisibility" of India's unorganized workforce.**
  - As of December 2025, over 31.2 crore workers are registered on the e-Shram portal. Also, **EPFO records the highest net addition of 20.06 lakh members in May 2025,** signaling increased employment opportunities and awareness.

What are the Key Issues Associated with India's Gig Economy?

- **Income Instability and Job Insecurity:** Unlike regular salaried jobs, gig work depends on demand, platform policies, and competition.
  - Many workers find their earnings fluctuate widely from week to week, making it difficult to plan financially or secure credit and loans.
    - This irregular income also means workers must often take on more hours just to make ends meet.
  - The **report "Prisoners on Wheels"** highlights severe work stress in the gig economy: **about 55% of delivery workers work 10–12 hours daily,** while **nearly 20% work 12–14 hours.**
    - Despite long hours, over one-third take home less than ₹10,000 per month after deducting expenses like EMIs, maintenance, and fines..
- **Occupational Health and "Hustle" Risks:** The pressure of **"10-minute delivery" targets and the "always-on" nature** of the apps lead to severe physical and mental health risks.


INDIA'S GIG ECONOMY
1 What is the Gig Economy?
Short-term, task-based work mediated through digital platforms
Examples: Ride-hailing, food delivery, logistics, freelancing
2 Key Statistics (India)
7.7 million gig workers (2020–21)
Projected 23.5 million by 2029–30)
Accounts for 1.5-2% of total workforce
3 Key Challenges
Income instability & absence of minimum wages
No social security (pension, health, insurance)
Algorithmic control & arbitrary deactivation
Long working hours and unsafe conditions
Weak grievance redressal mechanisms
3 Key Challenges
Income instability & absence of minimum wages
No social security (pension, health, insurance)
Algorithmic control & arbitrary deactivation
4 Regulatory Gaps
Social Security Code, 2020 -- limited implementation
No clarity on employment status
No algorithmic transparency norms
5 Global Best Practices
EU Platform Work Directive (2024)
Employment status tests
Algorithmic transparency
Fragmented state-level policies
ILO
6 Way Forward for India
Minimum earnings guarantee
Universal social security coverage
Transparent algorithms & appeal systems
Welfare boards for gig workers
7 Link to SDGs
SDG 8 - Decent Work & Economic Growth
SDG 10 - Reduced Inequalities
SDG 16 - Strong Institutions
India's gig economy can become a growth engine only if technological efficiency is matched with social justice and worker protection.
8 DECENT WORK & ECONOMIC GROWTH
10 REDUCED INEQUALITIES
16 STRONG INSTITUTIONS

- Workers often ignore safety protocols to meet delivery windows, leading to a high rate of road accidents that are often not compensated because the worker was **technically "off-duty" between gigs**.
- The report **"Prisoners on Wheels"** reveals severe health stress: over 80% work more than 10 hours daily, nearly half get no weekly day-off, and **over 99% report physical and mental health issues, often aggravated by long hours, income insecurity, and arbitrary ID deactivations.**

- **Lack of Adequate Regulation and Legal Protection:** India currently lacks a **comprehensive regulatory framework** that protects gig workers' rights.
  - **Gig workers are predominantly treated as "independent contractors" rather than formal employees.**
    - The Social Security Code, 2020 recognises gig workers for the purpose of social security, but **standards on minimum wages, working hours, fair payment mechanisms, and grievance redressal are yet to be implemented effectively**.
    - As a result, **over 82% of gig workers in India remain in the informal sector** without access to basic employment safeguard.
  - State efforts like the Rajasthan Platform Based Gig Workers (Registration & Welfare) Act, 2023 and similar laws in Karnataka aim to improve protections, but implementation remains uneven.
- **Algorithmic Management and Lack of Transparency:** Platforms largely manage work through opaque algorithms that **decide pay, ratings, and incentives.**
  - Workers often lack visibility into how these algorithmic decisions are made and have **no formal appeal mechanism** when affected by penalties or deactivations.
    - This creates a "**black box" environment** where workers face "**algorithmic anxiety",** the constant stress of **not knowing why their ratings dropped** or why they were suddenly **"shadow-banned**" or blocked from the app.
  - This lack of **algorithmic accountability** perpetuates bias and unfair treatment, which workers cannot challenge easily.
- **Embedded Gender and Social Gaps in Gig Employment:** Women gig workers face **additional barriers** such as limited career progression, lower pay, and safety concerns, especially during night shifts or in high-risk environments.
  - The World Economic Forum (WEF) notes a **30% gender wage gap** in the gig economy, higher than in traditional jobs; in India, structural informality and caregiving burdens are likely to widen this gap further.
  - Social factors such as **caste and class quietly influence access to gig work**, often determining who is concentrated in lower-paid roles and who has the economic cushion to participate in the sector.

What Measures can be Adopted to Strengthen India's Gig Economy?

- **Promote Active Implementation of Social Security Code: Operationalise the Social Security Fund and schemes** promised for gig/platform workers (health cover, accident insurance, maternity benefits, pension).
  - The Code provides for **aggregator contributions (capped)**, but benefits must be clearly notified and delivered.
  - Use **e-Shram and Aadhaar-linked IDs** to ensure **portability** across states/platforms and track eligibility. (Recent govt notes also highlight platform-worker registrations on e-Shram.)
- **Create a "Minimum Pay Floor"**: Pay should be based on time and distance based, not incentive games. Set a **statutory minimum earning standard** (per hour/per km plus waiting time), with periodic indexation (inflation/fuel costs).
  - For example, **New York City's minimum pay standards** for app-based delivery workers pay floor wage and periodic adjustment.
- **Fair Process Before Deactivation:** To protect gig workers from sudden loss of livelihood, platform companies should treat ID deactivation on par with employment termination.

   - This means providing **clear written reasons** for deactivation, giving **prior notice** except in cases of serious misconduct, and allowing workers a **fair opportunity to explain or defend themselves**.
      - Additionally, an **independent grievance or appeal mechanism** should be in place so that workers can challenge unfair decisions. Such safeguards promote transparency, accountability, and basic job security in the gig economy.
   - This directly addresses one of the biggest livelihood risks in platform work **(sudden "log-out unemployment").**
- **Algorithmic Transparency and Data Rights**: Mandate that platforms **disclose how ratings, incentives, penalties, and job-allocation work** in worker-friendly language; provide **audit trails** for disputes.
   - For instance, **Telangana's draft gig workers law** proposes algorithm transparency and structured grievance redressal.
   - India can draw valuable lessons from the **European Union's Platform Work Directive (2024),** which strengthens safeguards against opaque algorithmic management and introduces clearer tests to determine employment status.
   - Aligning domestic regulations with the **International Labour Organization's (ILO) framework on algorithmic management** would help ensure transparency, accountability, and fair treatment of platform workers while balancing innovation with labour rights.
- **Ensure National Standards with State-Led Implementation:** India should adopt a unified **Gig Workers Welfare & Rights Framework** that sets minimum national standards on wages, working hours, social security, safety, and grievance redressal, while allowing states to implement them through dedicated boards and welfare funds.
   - The **Rajasthan Platform Based Gig Workers Act, 2023** serves as a model by mandating worker registration, creating a welfare board, and levying a welfare fee on digital platforms to finance social security benefits.
- **Promote Occupational Safety**: Gig workers should be provided **mandatory accident insurance, emergency support, and protective gear** to ensure their safety. Platform work must be recognized as a safety-regulated occupation, with helmets, reflective jackets, vehicle fitness checks, and limits on work hours.
   - City-level enforcement should **create safe delivery zones, designated pick-up/drop points, and coordinate with traffic authorities** to protect workers.
   - Moreover for Quick Delivery Models, mandate **risk assessment, realistic timelines** and prohibit penalty structures that force speeding.
- **Strengthen Worker Voice And Grievance Redressal:** Create **tripartite platforms (Govt–Platform–Worker reps)** at state level for rate revision, disputes, and welfare design, similar to boards under other labour welfare laws.
   - Ensure **collective representation** is protected (no retaliation for union activity).

Conclusion:

India's gig economy **can remain sustainable only if growth is matched with worker protection** and **fair regulation.** Aligning with ILO principles can ensure transparency, dignity, and accountability in digital labour. Strengthening social security, regulating algorithms, and ensuring fair pay are essential to prevent exploitation. Such reforms advance **SDG 8 (Decent Work)** and **SDG 10 (Reduced Inequalities)**.

Strengthening India-EU Ties

This editorial is based on "Between India and EU, a carbon gap and an FTA bridge" which was published in The Indian Express on 02/01/2026. The article highlights the impact of EU's CBAM on Indian exporters and underscores the challenge lies in balancing climate ambition with fair trade, competitiveness, and the future of India's export-driven growth.

As the **European Union's Carbon Border Adjustment Mechanism** reshapes global trade, India–EU economic ties are entering a critical phase. With **bilateral trade exceeding €120 billion**, new carbon-linked rules will directly affect key Indian exports such as steel, aluminium, and cement. While these measures pose short-term challenges, they also underscore the **need for cleaner production and stronger carbon accounting frameworks in India.** The ongoing **India–EU Free Trade Agreement** negotiations offer a timely platform to address these concerns. If leveraged wisely, this transition can deepen a more resilient, competitive, and sustainable India–EU partnership.

How India–EU Relations Have Evolved Over Time?

The history of India-EU relations has transitioned from a simple buyer-seller relationship to a sophisticated strategic partnership. While it began with trade, it now encompasses defense, technology, and global governance.

- **Phase 1: Foundations (1960s – 1990s):** The early years were defined by India seeking developmental aid and market access for its goods.
  - **1962:** India became one of the first countries to establish diplomatic relations with the **European Economic Community (EEC).**
  - **1994**: A landmark Cooperation Agreement was signed, broadening the scope from pure trade to include political and cultural exchanges.
- **Phase 2: Upgradation to Strategic Partnership (2000 – 2010):** As India's economy liberalized, the EU recognized it as a global player.
  - **2000:** The **First India-EU Summit** was held in Lisbon, marking a watershed moment in institutionalizing the relationship.
  - **2004:** Relations were upgraded to a **"Strategic Partnership"** during the Hague Summit, placing India in the same category as the US and China for the EU.
  - **2007:** Negotiations for the **Broad-based Trade and Investment Agreement** (BTIA)—the FTA—began, though they would later stall for nearly a decade.
- **Phase 3: Modern Strategic Realignment (2016 – Present):** The current era is focused on the Indo-Pacific, green energy, and technology sovereignty.
  - **2016:** The Clean Energy and Climate Partnership was launched to align on the Paris Agreement goals.
  - **2022:** Formal resumption of FTA negotiations signaled a renewed commitment to de-risk from China.
  - **2025:** The European Union unveiled its **"New Strategic EU-India Agenda"** in September, 2025, to deepen ties across five pillars: **Prosperity & Sustainability, Technology & Innovation, Security & Defence, Connectivity & Global Issues, and Enablers Across Pillars, focusing on trade, critical tech, security, climate action, and mobility**, with a strong push to **finalize the EU-India Free Trade Agreement (FTA)** amidst global instability and rising geopolitical challenges, positioning India as a key partner.

What is the Current Development in the India EU-Relations?

- **Anchoring Economic Resilience**: India and the European Union share one of the world's most significant economic partnerships, EU is India's second-largest trading partner, accounting for trade in goods which is **11.5% of India's total trade**.
  - The EU remains a **key destination for Indian exports such as engineering goods, pharmaceuticals, textiles and IT services.**
  - As global supply chains diversify post-pandemic and amid geopolitical tensions, **India and the EU are increasingly viewing each other as reliable long-term economic partners.**
- **Renewed Push for the India–EU Free Trade Agreement (FTA)**: After remaining stalled for years, negotiations on the India–EU FTA **resumed in 2022,** reflecting mutual strategic urgency.
  - The proposed agreement aims to boost market access, reduce tariffs, facilitate investment, and enhance cooperation in digital trade, sustainability and supply chains.
    - **For India, it offers access to advanced technology and markets** and for the EU, it provides a trusted manufacturing and growth partner.
  - The FTA is being fast-tracked as a **"geopolitical necessity"** to de-risk supply chains from China, though friction **persists over the EU's** Carbon Border Adjustment Mechanism (CBAM).
- **Collective March Toward Energy Transition**: Energy cooperation has moved beyond policy dialogue to concrete infrastructure projects, specifically through the **National Green Hydrogen Mission** and the **EU's Hydrogen Bank**.

- The focus is on creating a "Green Hydrogen Corridor" where India serves as a primary production hub for Europe's decarbonization needs.
- This **"natural alignment"** leverages India's low-cost renewable scale and Europe's technology and capital to achieve **mutual Net Zero targets.**
- The **AM Green-Rotterdam Corridor Agreement (May 2025)** aims to **export 1 million tonnes of green ammonia annually** from India to Europe via the Port of Rotterdam.

- **Accelerated Technology Cooperation**: The India-EU Trade and Technology Council **(TTC),** established as **only the second such platform for the EU (after the US),** has become the primary vehicle for aligning digital standards.
  - Both sides are focusing on **"human-centric" AI** and the interoperability of **Digital Public Infrastructure (DPI)** to create a global alternative to closed digital ecosystems.
  - TTC serves as a **strategic shield against technological dependencies,** fostering co-development in frontier areas like 6G and semiconductors rather than mere buyer-seller ties.
  - For instance, in 2025, both sides **launched the GANANA project** for **High-Performance Computing (HPC).**
- **Enhanced Push for Connectivity:** The India-Middle East-Europe Economic Corridor (IMEC), is being operationalized to create a seamless multimodal transport and energy link.
  - This corridor is designed to bypass traditional **"chokepoints"** and offer a transparent, rules-based alternative to the Belt and Road Initiative (BRI).
  - IMEC is evolving from a transport route into a **"green and digital corridor"** that will fundamentally lower the cost of Eurasian logistics while integrating energy grids.
    - Projections indicate IMEC will **reduce logistics costs by 30%** and **transit time by 40%.**
- **Geopolitical and Strategic Convergence**: The launch of the **"New Strategic EU-India Agenda"** in late 2025 signals a shift toward making the **partnership "actionable** and cohesive."
  - Both sides have transitioned from a relationship of **"distant democracies"** to **"indispensable partners"** in a multipolar world, specifically focusing on de-risking from China and navigating the unpredictability of US trade policies.
  - This convergence is driven by the shared **goal of "Strategic Autonomy,"** where India and the EU act as stabilising poles to **prevent a G2-style bipolarity between the US and China**.
  - **Cooperation on Indo-Pacific stability**, maritime security, and multilateral reform reflects a shared interest in a rules-based international order and strategic autonomy from major power rivalries.
- **People-to-People and Knowledge Partnerships:** Beyond economics, India–EU relations are expanding through education, research, mobility, and skill development.
  - **Programs under Horizon Europe, Erasmus+**, and research collaborations enhance knowledge exchange and strengthen long-term societal ties.
  - Further **joint research calls are planned for 2026**, including on EV battery recycling and wastewater treatment, with total TTC-linked investments amounting **to about €60 million**.

What are the Key Areas of Friction in India-EU Relations?

- **Trade and Market Access Disputes:** The Free Trade Agreement (FTA) negotiations, restarted in 2022, are currently stalled over sensitive sectors like automobiles, dairy, and **"Mode 4" labor mobility.**
  - **The EU wants India to sharply reduce tariffs on automobiles, wines, dairy and luxury goods**, while **India seeks greater access for its pharmaceuticals, textiles, and IT services**.
    - India fears that **sudden tariff cuts may hurt domestic industries**, while the **EU argues that deeper liberalisation is needed** for a balanced partnership.

- **"Green Protectionism":** The EU's Carbon Border Adjustment Mechanism (CBAM) has become a major friction point. **By imposing a carbon cost on imports like steel, aluminium and cement**, the EU is effectively increasing costs for Indian exporters.
  - For example,In FY2025, Indian **steel and aluminum exports to the EU dropped by 24% due to compliance uncertainty.**
  - Moreover it will reshape export contracts, with European buyers increasingly **inserting clauses to pass on carbon costs**, requiring **verified plant-level emissions data,** and renegotiating prices **as EU carbon rates fluctuate**.
    - Many **exporters now quote dual prices**, a base price and a CBAM-adjusted price—to remain competitive.
    - Since India's industries are still transitioning to low-carbon technologies, this risks reducing export competitiveness.
- **Standards and Regulatory Barriers:** Beyond tariffs, Indian exporters face difficulties due to **strict EU technical, sanitary and environmental standards.**
  - For instance, Indian exports such as **Basmati rice, dairy products, and chemicals frequently face EU non-tariff barriers,** particularly over **pesticide residue limits (e.g., Tricyclazole)**, contamination risks, and gaps in traceability and certification.
    - Small and medium Indian firms often struggle to meet these requirements, making market entry expensive and complex despite tariff concessions.
- **Geopolitical Differences**: India and the EU do not always align on global geopolitical issues. Differences have surfaced over India's energy ties with Russia, voting patterns at multilateral forums, and strategic autonomy.
  - For instance, **EU and U.K. sanctions** were placed on the **Indian-Russian joint venture Nayara Energy in late 2025**, reflecting the **EU's use of economic tools to pressure third-party ties with Moscow.**
  - The EU's attempt to link trade and technology cooperation to India's foreign policy alignment creates a **"trust deficit,"** as New Delhi perceives Brussels' stance as Eurocentric and insensitive to Asia's unique security dependencies.
    - In this context, **India's EAM quoted** that ***"Europe has to grow out of the mindset that its problems are the world's problems but the world's problems are not Europe's problems".***
  - While both sides support a rules-based order, their approaches to global crises and sanctions sometimes diverge, affecting political trust.
- **Differences in Data Governance:** Digital trade is a growing area, but differences remain in data protection laws.
  - A major point of contention within the Trade and Technology Council (TTC) is the mismatch between the **EU's GDPR (General Data Protection Regulation) and India's DPDP Act 2023. While the EU pushes for "Free Flow of Data with Trust,"** India emphasizes **"Data Sovereignty,"** requiring certain critical datasets to be stored locally for national security and economic growth.
    - Since India lacks an EU adequacy status, cross-border data flows rely on complex legal mechanisms like Standard Contractual Clauses, increasing compliance costs and friction.
    - This **creates uncertainty for businesses** in sectors like fintech, cloud services and digital platforms, **slowing deeper digital integration**.
- **Divergent Approaches to Investment Protection**: While the EU seeks strong investor protections, India prefers a cautious approach to avoid excessive litigation and protect policy space.
  - For instance, the EU seeks broader **"Fair and Equitable Treatment" (FET)** and "**Most Favored Nation" (MFN)** clauses to ensure its firms are not discriminated against compared to domestic or third-country firms.
    - **India is traditionally averse to including MFN in its investment treaties.**

What Measures Can be Adopted to Strengthen India- EU Ties?

- **Fast-Tracking a Balanced and Inclusive FTA:** India and the EU should adopt a phased and flexible Free Trade Agreement, allowing sensitive sectors time to adjust.
  - **Special safeguard clauses**, **longer transition periods for Indian industries**, and **differential treatment for MSMEs** can make the agreement politically and economically sustainable.
    - A strong FTA can unlock market access, attract investments, and reduce trade uncertainty.
- **Aligning Climate Goals Without Penalising Development:** To address concerns around CBAM, India and the EU should cooperate on mutual recognition of carbon accounting systems, technology sharing, and climate finance.
  - The **EU can support India through concessional green finance, technology transfer, and capacity building** rather than trade penalties.
    - This would ensure climate action remains equitable and development-friendly.
- **Strengthening Industrial and Green Technology Cooperation:** Joint initiatives in green hydrogen, electric mobility, renewable energy, semiconductors, and battery storage can help both sides reduce dependency on third countries.
  - Establishing **joint research hubs, innovation funds**, and **technology transfer platforms** would enhance long-term industrial resilience.
- **Improving Regulatory Compatibility and Standards**: India and the EU should work toward mutual recognition of standards, conformity assessments, and certification systems.
  - Capacity-building support for Indian MSMEs to meet EU technical, environmental and safety standards can reduce compliance costs and expand market access.
- **Enhancing Mobility, Skills and People-to-People Ties:** Easing visa regimes for students, professionals, researchers and skilled workers would unlock the full potential of the services sector.
  - **Expanding mutual recognition** of qualifications and promoting academic exchanges can strengthen long-term social and economic linkages.
- **Deepening Cooperation in Digital and Data Governance:** Through the India–EU Trade and Technology Council, both sides can work toward trusted data-sharing frameworks, cyber security cooperation, and responsible AI governance.
  - **Alignment in digital standards** will help unlock growth in fintech, AI, and digital services.
- **Building Strategic Trust and Policy Dialogue**: Regular high-level political dialogue, crisis communication mechanisms, and cooperation in multilateral forums can help manage differences on geopolitics, sanctions, and global governance.
  - A **transparent and consultative approach** will strengthen confidence and long-term partnership.

Conclusion:

As global trade, climate action and geopolitics become increasingly interconnected, **India and the EU must move beyond transactional engagement toward a partnership grounded in trust, sustainability and shared strategic interests**. By aligning economic growth with climate responsibility, deepening technological and people-to-people linkages, and ensuring fairness in global rules, both sides can build a resilient, future-ready partnership. **A balanced and forward-looking India–EU relationship will not only strengthen bilateral ties but also contribute to a more stable, inclusive and rules-based global order.**

Reimagining India'S Waste Management System

This editorial is based on "Transforming a waste-ridden urban India" which was published in The Hindu on 03/01/2026. This article foregrounds urban waste as a climate, public health, and governance challenge, linking India's mounting waste burden with global climate commitments and circular economy principles.

As highlighted at **COP30, waste has emerged as a central climate challenge**, with methane from unmanaged urban waste posing a serious global threat. In India, rapid urbanisation means cities are projected to generate **165 million tonnes of waste annually by 2030**, rising sharply to **436 million tonnes by 2050**, alongside **over 41 million tonnes of greenhouse gas emissions**. The reality of waste-ridden cities now directly affects public health, air quality, water security, and economic productivity. Initiatives such as **Swachh Bharat Mission** and **Mission LiFE** underscore the urgency of behavioural change and systemic reform. Moving decisively from a linear **"collect–dump" approach** to a **circular waste management model** is thus not optional, but an existential necessity for India's urban future.

What is the Present Scenario of Waste Generation in India?

- **Overall Waste Generation**: India is generating an increasingly large amount of waste as its population grows, cities expand, and consumption patterns change. Recent estimates show that the country produces around **170,000 tonnes of municipal solid waste every day**, amounting to roughly **62 million tonnes annually**.
  - Globally, assessments by the **United Nations Environment Programme** highlight that waste generation is **accelerating faster in developing economies,** making waste management a critical environmental and governance issue rather than merely a sanitation concern.
- **Urban–Rural Differences in Waste Generation:** Waste generation patterns differ sharply between urban and rural areas in India.
  - **Cities produce much higher waste per person**. Urban centres are projected to generate **around 165 million tonnes of waste annually by 2030**, placing immense pressure on municipal systems. In contrast, rural areas generate less waste per capita, and much of it is biodegradable.
  - However, **rural regions often lack organised collection and scientific processing, leading to open dumping and burning**.
    - Thus, while **urban India faces a scale problem, rural India struggles with inadequate waste management systems.**
- **Types and Composition of Waste:**
  - **Organic Waste:** Leftovers, vegetable peels, fruit waste, market and garden waste, the "wet" fraction that rots quickly. When left in landfills or dumped, **it produces methane**, a powerful greenhouse gas and causes odour, flies and disease risk.
    - **More than half of municipal solid waste in many Indian cities is organic**.This makes it the largest single stream and the most important to manage.
  - **Dry waste:** Paper and cardboard, glass bottles, metal cans, textiles, rubber, items that are often recyclable if collected separately.
    - Dry waste constitutes **nearly one-third (35% as per Ministry of Housing and Urban Affairs) of municipal solid waste** in India, according to government assessments and waste characterisation studies.
  - **Plastic Waste:** It includes all kinds of plastic packaging, single-use items, multi-layer sachets, PET bottles, film, and plastic fragments.
    - India generates **about 5.6 million tonnes of plastic waste per year**.
  - **Electronic Waste (E-waste):** India is among the fastest-growing producers of electronic waste in the world.
    - With rapid digitisation, frequent replacement of gadgets, and growing use of smartphones, laptops, and appliances.
- India's e-waste generation surged by 73% in five years, reaching **1.751 million MT in 2023-24.**
    - Also, as of FY23, India has generated about 100 kilotonnes (kt) of cumulative **solar waste**, which will increase to 340 kt by 2030.
  - **Biomedical Waste:** Biomedical waste is generated from hospitals, clinics, laboratories, and healthcare facilities.
    - In major urban centres such **as Delhi, about 40 tonnes of biomedical waste are**

produced every day, reflecting the pressure on waste treatment infrastructure.
- Improper handling of such waste can spread infections and pose serious public health risks. While national figures vary, urban healthcare systems contribute a major share of biomedical waste generation.

- **Hazardous Waste:** Includes toxic, flammable, corrosive, or reactive waste generated mainly by industries such as chemicals, pharmaceuticals, and metallurgy.
  - According to the Central Pollution Control Board (CPCB), **India generates around 7.9 million tonnes of hazardous industrial waste annually**.
  - Safe storage, transport, and disposal remain major challenges, especially in industrial clusters.
- **Construction and Demolition (C&D) Waste**: Construction and demolition waste is generated from activities such as building construction, renovation, and demolition, and mainly consists of bricks, concrete, tiles, soil, plaster, wood, and rubble.
  - With rapid urbanisation and infrastructure expansion, **India generates around 10–12 million tonnes of C&D waste annually**.
  - A significant portion of this bulky waste is dumped illegally on roadsides, open plots, and water bodies, leading to urban flooding, dust pollution, and land degradation.

What is the Regulatory Framework Governing Waste Management in India?

- **Statutory and Rule-Based Framework:** India does not operate under a single, consolidated "Waste Management Act." Instead, waste governance is regulated through a set of stream-specific rules, periodically revised to incorporate mechanisms such as Extended Producer Responsibility (EPR).

Waste Stream	Governing Regulation	Core Focus
Municipal Solid Waste	Solid Waste Management Rules, 2016 (revised several times)	• Mandatory source segregation (wet, dry, hazardous) and defined responsibilities of Bulk Waste Generators
Plastic Waste	Plastic Waste Management Rules, 2016 (revised several times)	• Ban on single-use plastics and EPR obligations for Producers, Importers, and Brand Owners (PIBOs)
E-Waste	E-Waste (Management) Rules, 2022 (updated in 2024)	• Mandatory EPR targets and compulsory registration of recyclers/refurbishers on the CPCB portal
Construction & Demolition Waste	C&D Waste Management Rules, 2016 (new rules notified in 2025, effective April 2026)	• Recycling mandates for large projects and compulsory use of recycled materials • Web monitoring through portals
Hazardous Waste	Hazardous and Other Wastes Rules, 2016 (latest updated in 2024)	• Regulation of industrial waste handling and cross-border movement • Key amendment added penal provisions for contravention
Bio-Medical Waste	Bio-Medical Waste Management Rules, 2016 (latest updated in 2018)	• Colour-coded segregation and mandatory scientific treatment • Amended rules stipulate that generators of bio-medical waste such as hospitals, nursing homes, clinics, and dispensaries etc will not use chlorinated plastic bags and gloves beyond March 27, 2019 in medical applications to save the environment

- **Institutional Architecture:** Waste management enforcement in India follows a multi-tiered regulatory structure:
  - **Ministry of Environment, Forest and Climate Change (MoEFCC): Apex body** responsible for policy formulation and rule notification at the national level.
  - **Central Pollution Control Board (CPCB): Sets technical standards, coordinates with states**, and manages centralized digital platforms for EPR compliance and monitoring.
  - **State Pollution Control Boards (SPCBs) / Pollution Control Committees (PCCs):** Primary **enforcement agencies** granting Consent to Establish/Operate and overseeing compliance.
  - **Urban Local Bodies (ULBs):** Frontline agencies responsible for collection, transportation, and scientific processing of municipal solid waste.
- **Contemporary Regulatory Shifts:** India's waste governance framework has evolved around **three key modern pillars**:
  - **Extended Producer Responsibility (EPR): Manufacturers are legally accountable for the end-of-life management of products** such as plastics, electronics, and batteries, with annual recycling targets and financial penalties for non-compliance.
  - **Digital Compliance and Monitoring:** EPR obligations are tracked through CPCB-managed digital portals, where producers and recyclers trade verified EPR certificates.
  - **Extended Bulk Waste Generator Responsibility (EBWGR):** Recent government initiatives impose greater responsibility on large establishments such as malls, hospitals, and housing complexes, to process biodegradable waste on-site or incur higher user charges.

What are the Major Gaps in India's Waste Management System ?

- **Failure of Segregation at Source:** Segregation of waste into wet, dry, and hazardous categories remains weak across most cities. Despite rules mandating source segregation, cities like **Delhi and Mumbai are segregating less than 50 per cent of the total waste.**
  - When mixed waste reaches collection vehicles or processing plants, **recyclables get contaminated and organic waste cannot be composted or bio-methanated efficiently.**
    - This single failure **increases landfill load** and **raises treatment costs at every downstream stage.**
- **Continued Dependence on Landfills and Dumpsites:** India still relies heavily on landfilling as the default waste disposal method.
  - Estimates suggest that **over half of municipal solid waste ends up in dumpsites**, many of which are open and unscientific.
    - Large legacy dumps like **those around Delhi (Ghazipur),** and other metros continue to **emit methane**, leach toxic liquids into groundwater, and cause air pollution through fires.
  - **Limited progress in landfill remediation** means cities are running out of land for waste disposal.
- **Inadequate Processing and Treatment Infrastructure:** While waste generation is rising rapidly, **processing capacity has not kept pace.** Composting plants, biomethanation units, material recovery facilities, and C&D recycling plants are unevenly distributed and often underutilised.
  - Due to this, less than 30% of waste is treated. Plants frequently shut down due to poor feedstock quality, operational issues, or lack of market demand for outputs like compost or refuse-derived fuel.
    - **For instance, Bidawadi WtE plant in Bengaluru** has underperformed, often shutting down because the mixed waste provided damages its machinery.
- **Limited Capacity of Urban Local Bodies (ULBs):** Urban Local Bodies are the backbone of waste management, but **many lack technical expertise, manpower, and administrative capacity.** Smaller municipalities and towns often depend on outdated equipment and short-term contracts.

- Financially, ULBs remain constrained, with user charges recovering only a **small fraction of waste management costs**, making long-term planning and innovation difficult. This capacity gap results in reactive rather than preventive waste management.
- Dependency on central grants like SBM-U 2.0 often leads to **"ghost infrastructure"** where plants are built but stand idle due to lack of operational funds.

- **Weak Implementation of Extended Producer Responsibility (EPR):** Although EPR has been introduced for plastics and e-waste, **coverage and enforcement remain uneven.** Tracking, verification, and accountability gaps allow under-reporting and paper compliance.
  - It gives rise to **"greenwashing"** and the sale of fraudulent recycling certificates without physical material recovery.
  - Many waste categories, such as multilayer plastics and composite packaging, **still lack effective take-back systems.**
  - This shifts the burden of waste management disproportionately onto municipalities instead of producers and consumers.
- **Challenges in Integrating the Informal Sector:** In India, **nearly 80% of plastic waste collection is handled by the informal sector.**
  - An estimated **1.5 to 4 million people work in the informal waste sector**; over 70% of them are women.
  - However, this sector **operates without formal recognition, social security, or safety standards.** Lack of integration with municipal systems leads to inefficiencies and exploitation.
  - When formal waste contracts ignore informal workers, recycling rates may fall instead of improving, as informal networks are disrupted without viable alternatives.
- **Poor Monitoring, Data Gaps and Accountability Issues: Accurate data on waste generation, composition, processing, and disposal** is often missing or inconsistent across cities and States.
  - For instance, most states report only consolidated data and limited ULB-wise information **(CPCB, 2021).**
  - As of 2024, **nearly 22% of India's daily waste remains entirely unaccounted for or leaked into the environment.**
  - Inadequate site-level monitoring,especially of leachate and groundwater, and substandard data quality hinder targeted interventions.
    - Administrative delays have also weakened compliance with NGT directives due to poor tracking mechanisms.
- **Behavioral Gaps and Public Apathy:** Public participation remains one of the weakest links in the system. Many citizens view waste as solely a municipal responsibility and resist behavioural changes such as segregation, composting, or paying user charges.
  - For example, **residents near a Metro station in Bengaluru were forced to clean a decade-old "blackspot"** (illegal dumping ground) themselves. Despite the presence of a formal collection system, market vendors and passersby continued to dump garbage there for over ten years, **demonstrating a persistent lack of civic responsibility even when services are available.**
  - **Convenience-driven consumption,** excessive packaging, and littering worsen the problem.

What are the Consequences of Poor Waste Management ?

- **Exacerbating Environmental Degradation:** Poorly managed waste directly pollutes the environment. Open dumping and burning of waste release toxic gases such as **particulate matter, dioxins, and furans, degrading air quality in cities.**
  - Leachate from dumpsites contaminates groundwater and nearby rivers, **as seen around large landfill sites like Ghazipur (Delhi) and Deonar (Mumbai).**
  - Plastic waste persists in soil and water for decades, entering food chains and harming

ecosystems. This widespread pollution **reduces environmental quality and damages biodiversity.**

- **Contribution to Climate Change:** Waste is a significant but often underestimated contributor to climate change. Organic waste dumped in **landfills decomposes anaerobically and emits methane,** a greenhouse gas far more potent than carbon dioxide over the short term.
  - The **waste sector contributed to about 4% of India's total GHG emission** in 2018.
  - Frequent landfill fires, such as those reported in Delhi's dumpsites, further release carbon dioxide and black carbon, worsening climate impacts and local air pollution simultaneously.
- **Public Health Risks:** Unmanaged waste creates ideal conditions for the spread of disease. Open dumps **attract flies, mosquitoes, rats, and stray animals,** increasing the risk of vector-borne and water-borne diseases such as **dengue, malaria, cholera, and diarrhoea.**
  - Waste pickers and sanitation workers **face constant exposure to sharp objects, toxic substances, and biomedical waste, often without protective gear**.
    - During the Covid-19 period, improper handling of biomedical waste highlighted how waste mismanagement can amplify health crises.
- **Urban Flooding and Drainage Failures:** Solid waste is a major cause of urban flooding in Indian cities. **Plastic bags, food waste, and construction debris clog** stormwater drains, preventing the natural flow of rainwater.
  - Cities like **Mumbai, Chennai, and Bengaluru** frequently experience flooding during monsoons partly due to waste-blocked drainage systems. These floods damage homes, disrupt transport, contaminate drinking water, and impose recurring economic losses on households and city administrations.
    - A severe outbreak of waterborne disease occurred in the Bhagirathpura, **Indore** after **sewage leaked into the drinking water supply**, leading to dozens of deaths and hundreds falling ill with symptoms such as **diarrhoea and vomiting due to contaminated water.**
- **Loss of Valuable Resources:**
  - When waste is dumped or burned, valuable materials are permanently lost. **Organic waste could be converted into compost or biogas; plastics and metals could be recycled,** and construction waste could replace natural aggregates. Instead, India continues to extract fresh raw materials while discarding recoverable resources.
  - **This linear "use and throw" approach** increases pressure on land, forests, minerals, and water, making development more resource-intensive and environmentally costly.
- **Economic Inefficiencies and Rising Public Costs:** Inefficient waste management imposes high economic costs on governments and society. **Treating mixed waste is far more expensive than handling segregated waste**, increasing municipal expenditure.
  - **Healthcare costs rise** due to pollution-related illnesses, while productivity is lost due to sickness and flood-related disruptions.
  - At the same time, **missed opportunities in recycling, composting, and waste-to-energy mean lost jobs** and revenue that could otherwise strengthen local economies.
- **Decline in Urban Liveability and Quality of Life:** Mountains of garbage, foul odours, polluted water bodies, and frequent fires reduce the overall quality of urban life.
  - Waste-ridden neighbourhoods experience **lower property values and social stress, often affecting poorer communities disproportionately**.
  - Cities aspiring to be global economic and cultural hubs struggle to attract investment and tourism when basic cleanliness and environmental safety are compromised.

What Measures are Needed to Address the Gaps in Waste Management in India ?

- **Strengthening Policy and Regulatory Reforms:** Clear and enforceable policies are the foundation for transforming waste into a resource. Waste management rules covering solid waste, plastic waste, e-waste, biomedical waste, and construction and demolition waste already exist, **but their implementation needs to be strengthened**.
  - Strict **enforcement of source segregation, penalties for illegal dumping,** and **accountability of bulk waste generators** can significantly reduce landfill dependence.
  - Globally, countries like **Japan** enforce strict household segregation laws, where non-compliance can attract fines, ensuring high-quality recyclable waste and minimal landfill dependence.
  - **Regular audits, transparent reporting**, and coordination across urban, environment, and construction departments are essential to make regulations effective on the ground.
- **Transition to a Circular Economy Model:** Moving from a **linear "use–dump" approach to a circular economy is key to long-term waste solutions.** In a circular system, waste is treated as a resource that can be reused, recycled, or converted into energy.
  - The **Amsterdam** circular economy model **focuses on designing products for reuse and recycling, reducing raw material extraction** while creating green jobs.
  - This shows that circularity improves both environmental and economic outcomes.
- **Use of Technology and Innovation:** Technology enhances efficiency, transparency, and scale in waste management. **Indian cities increasingly use GPS-enabled collection vehicles,** automated material recovery facilities, and bio-methanation plants to convert wet waste into energy.
  - For example in **Sweden**, advanced waste-to-energy plants convert **non-recyclable waste into electricity and district heating, reducing landfill use to near zero**.
    - Such innovations demonstrate how technology can turn waste into a productive input.
- **Extended Producer Responsibility (EPR) and Market Development:** EPR ensures that producers share responsibility for the waste generated by their products. India's EPR framework for plastics and e-waste is a step forward, **but stronger monitoring and enforcement are needed.**
  - For instance **European Union EPR** systems for packaging and electronics have significantly improved recycling rates **by making producers financially responsible for end-of-life management**.
  - When backed by reliable recycling markets, EPR reduces the burden on municipalities and encourages sustainable product design.
- **Integrating and Empowering the Informal Sector:** India's informal waste pickers play a vital role in recycling but often work without safety or recognition. Cities that formally integrate waste pickers through identity cards, protective equipment, and cooperative models achieve higher recycling efficiency and social inclusion.
  - For example, **Brazil's cooperative-based waste picker model** offers a global example where **informal workers are recognised as environmental service providers,** ensuring livelihoods while strengthening recycling systems.
- **Financing, Capacity Building and Institutional Strengthening:** The **15th Finance Commission** earmarked substantial grants for urban local bodies, with a major share linked to **sanitation, solid waste management, and performance-based outcomes**.
  - These grants encourage cities to improve source segregation, processing capacity, and service delivery rather than merely creating infrastructure.
  - The **Indore model** offers a replicable example, where **consistent funding, strong municipal leadership, citizen participation, and outcome-based monitoring** enabled high segregation levels, decentralised processing, and **elimination of open dumping**.

- Adapting such an approach which **combines predictable finance with institutional capacity and accountability**, can help other Indian cities build durable and efficient waste management systems.

- **Behavioural Change and Citizen Participation:** Citizen behaviour determines the success of any waste management system. **Indian cities with sustained awareness campaigns, door-to-door engagement, and incentives for segregation have achieved higher compliance**.
  - For instance, **San Francisco** achieved **landfill diversion rates above 80%** through strict segregation laws, clear labelling, and continuous public education.
  - These experiences show that **long-term behavioural change requires consistent messaging and visible results.**

Conclusion:

Transforming waste into a resource is essential for achieving key **Sustainable Development Goals**, especially **SDG 11, SDG 12, SDG 13, and SDG 6**, while improving public health and urban liveability. For India, effective waste management underpins national priorities such as **Swachh Bharat Mission**, **Mission LiFE**, and the vision of a **Viksit Bharat by 2047**. Strengthened governance, circular economy practices, and responsible citizen behaviour can together make India's cities cleaner, more resilient, and resource-efficient.

Rethinking Care in India'S Economy

This editorial is based on "The struggle to count women's labour" which was published in The Hindu on 05/01/2026. The article highlights the invisibility of women's labour which is neither measured in GDP nor systematically counted in national accounts or policy frameworks.

For centuries, economic systems have systematically ignored the labour that sustains households and reproduces the workforce. This historical negligence continues today, with women globally spending **2.8 hours more per day than men on unpaid care and domestic work** (**United Nations, 2023**). The care economy extends beyond physical tasks to include emotional and mental labour essential for social stability and productivity. Yet, this work remains excluded from GDP calculations, labour laws, and budgetary priorities. Recognising the care economy is therefore central to achieving inclusive and sustainable economic growth.

What is the Care Economy?

- **About:** According to the International Labour Organisation **(ILO),** the care economy refers to "The production and provision of goods and services that are necessary for the physical, social, emotional and intellectual well-being of people." It includes
  - **Unpaid Care Work**: Cooking, cleaning, fetching water or fuel, childcare, elder care, caring for the sick or persons with disabilities, and managing household routines.
  - **Emotional and Mental Labour**: Providing emotional support, maintaining family relationships, resolving conflicts, planning household needs, and ensuring the well-being of family members.
  - **Paid care Work**: Jobs such as nurses, Anganwadi workers, ASHA workers, domestic workers, teachers, childcare workers, and elder-care providers.

What are the Key Provisions Governing Care Economy in India?

- **Constitutional Provisions:**
  - **Article 14 – Right to Equality:** It guarantees equality before the law and equal protection of laws to all persons.
    - For working women, it ensures that no arbitrary or unequal treatment is permitted in employment-related matters.
  - **Article 15 – Prohibition of Discrimination:** Article 15 prohibits discrimination on grounds of sex, among other factors.
    - In the context of employment, **it safeguards women against gender-based exclusion**

and ensures equal access to public opportunities.

- **Article 16 – Equality of Opportunity in Public Employment:** This provision ensures equal opportunity for all citizens in matters of public employment.
  - It protects women from being **denied jobs, promotions, or service benefits solely on the basis of gender.**
- **Article 39 – Principles to be Followed by State**: It lays down important socio-economic principles relevant to working women:
  - **39 (a)**: **Men and women have an equal right** to an adequate means of livelihood.
  - **39(d)**: Mandates **equal pay for equal work** for both men and women.
  - **39 (e)**: Directs the State to protect workers' health, prevent child labour, and avoid forcing citizens into unsuitable employment due to economic necessity.
- **Article 42 – Just and Humane Conditions of Work:** It directs the State to ensure humane working conditions and provide maternity relief.
  - This forms the constitutional basis for workplace safety standards and maternity-related protections for women.

- **Statutory Labor Protections:** These laws provide the legal foundation for paid care workers and maternity rights in the formal sector**.**
  - **Maternity Benefit (Amendment) Act, 2017:** Mandates **26 weeks of paid maternity leave** for the first two children.
    - Provides for **"Work from Home"** options if the nature of the work allows.
  - **Code on Social Security, 2020**: This code aims to extend social security (insurance, maternity benefits, etc.) to unorganized workers, gig workers, and platform workers for the first time.
    - It recognizes **"home-based workers,"** which is a critical step for formalizing domestic care work.

- **Institutional Frameworks & Worker Categories:**
  - The Indian care economy relies heavily on a large workforce of "voluntary" or "honorary" workers who implement national health and nutrition programs.
  - **Integrated Child Development Services (ICDS):**Governs Anganwadi Workers (AWWs) and Helpers. They are the backbone of early childhood care and nutrition (ECCE) in India.
  - **National Health Mission (NHM):** Governs ASHA (Accredited Social Health Activists). While legally classified as "volunteers," they are the primary providers of maternal and neonatal care in rural India.
  - **Palna Scheme**(**National Creche Scheme):** A central scheme providing **day-care facilities for children (6 months to 6 years)** of working mothers, particularly those in the unorganized sector.
- **Elderly & Disability Care:**
  - Provisions for the aging population and persons with disabilities focus on maintenance and health rights.
  - **Maintenance and Welfare of Parents and Senior Citizens Act, 2007**: Makes it a **legal obligation for children/heirs to provide maintenance** to senior citizens. It also mandates the establishment of old-age homes in every district.
  - **Rights of Persons with Disabilities Act, 2016**: It promotes inclusion, dignity, and independence, moving beyond a welfare approach to a rights-based framework for 21 recognized disabilities, ensuring accessibility and equal opportunities.
- **Evolving Policy & Recognition:**
  - Recent shifts indicate a move toward quantifying the "invisible" care economy.
  - **Time Use Survey (TUS):** Conducted by the **NSO,** this data is now being used to argue for the inclusion of unpaid care work (mostly by women) into the National GDP.

Global Norms Governing Care Economy

- **Beijing Platform for Action (1995):** It was the **first global framework to formally recognise unpaid care and domestic work** as an economic and development issue.
  - It called for making women's unpaid labour **visible through time-use surveys and satellite national accounts**.
  - The Platform emphasised **redistribution of care responsibilities** between men and women, and across the State, market, and households.
    - These provisions **laid the normative foundation for later frameworks such as SDG 5.4 and ILO care-economy standards.**
- **International Labour Organization (ILO) Provisions:**
  - **Care Work and Care Jobs for the Future of Decent Work (2018)**: Recognises care work as productive economic activity, encompassing both paid and unpaid care.
    - ILO's **"5R Framework for Decent Care Work**": Recognize, Reduce, and Redistribute unpaid care work, and Reward and Represent paid care work by promoting decent work for care workers and guaranteeing their representation, social, dialogue and collective bargaining.
  - **ILO Convention No. 156 – Workers with Family Responsibilities:** Mandates that workers with caregiving responsibilities should not face discrimination.
    - Encourages policies that enable men and women to balance paid work and care duties.
  - **ILO Convention No. 183 – Maternity Protection:** Guarantees maternity leave, health protection, and income security for working women. Establishes care responsibilities as a **shared societal obligation**, not an individual burden.
- **United Nations (UN) Initiatives:**
  - Sustainable Development Goals (SDGs)
    - **SDG 5.4**: Explicitly recognises unpaid care and domestic work through public services, infrastructure, and social protection.
    - **SDG 8**: Promotes decent work, including care-sector employment.
    - **SDG 10**: Addresses inequalities arising from unpaid and informal care burdens.
  - **UN High-Level Panel on Women's Economic Empowerment:** Identifies unpaid care work as a **structural barrier** to women's labour-force participation.
    - Recommends investment in care services as an economic growth strategy.
  - **UN Women:** Defines the care economy as the foundation of human well-being and economic sustainability.
    - Advocates time-use surveys, care-sensitive budgeting, and expansion of public care infrastructure.
    - Emphasises redistribution of care between **state, market, community, and households**.

What are the Key Issues Associated with India's Care Economy ?

- **Invisibility and Undervaluation of Care Work:** Most care work, such as cooking, cleaning, childcare, elder care, and emotional support, is **not counted as "work"** because it does not generate direct income.
  - **For example,** a homemaker who works 10–12 hours daily contributes to the health, productivity, and stability of the family, **yet her labour is absent from GDP calculations**.
  - This invisibility leads policymakers to underestimate the real size and importance of the care economy.
- **Gender Gap In Unpaid Care Responsibilities:** Women bear a disproportionate share of unpaid care work. In India, of the total time in a day, **females spent 16.4% of their time on unpaid domestic work compared to males, who only spent 1.7%** of their time on such work. This is not all.

- Other than domestic work, **females in India spent 137 minutes a day** in caregiving activities, taking care of children and the elderly, **compared to 75 minutes spent by males**.
- Even **working women often manage both paid employment and unpaid household responsibilities**, leading to **time poverty,** stress, and limited career progression.

- **Data and Measurement Deficits:** India's Time Use Survey (2019) was an important step in documenting unpaid work, **but such data collection remains infrequent and incomplete.**
  - **Unpaid and emotional labour is still absent** from national income accounting and policy design.
    - The **International Labour Organization notes that without regular measurement,** care work continues to be ignored in economic planning and resource allocation.
- **Absence Of Comprehensive Legal Framework:** India **lacks a dedicated legal or policy framework** recognising unpaid care and emotional labour.
  - Notably the **Madras High Court and Delhi High Court** have increasingly recognized homemakers' non-financial contributions (domestic chores, childcare) as crucial to building family assets .
    - For instance, in the ***Kannaian Naidu vs Kamsala Ammal (2023)*** — Madras High Court held that women's household and caregiving labour **contributes indirectly to asset creation, entitling them to equal property share.**
  - **However, without legislative backing,** unpaid caregivers remain excluded from social security, pensions, and labour protections.
- **Inadequate Public Care Infrastructure:** The limited availability and uneven quality of affordable childcare, eldercare, and mental health services continue to **shift the primary responsibility of care onto households, with women bearing a disproportionate burden.**
  - Insufficient crèches and overstretched Anganwadi centres weaken early childhood care and force women to exit or avoid formal employment, while the severe underinvestment in mental health infrastructure,undermines workforce productivity and social resilience.
  - At the same time, India faces a rapidly ageing population, **necessitating an estimated $4.8–$8.4 billion investment by 2030** to meet growing demand for senior living and eldercare infrastructure.
    - Together, these deficits reveal a **structural neglect of the care economy**, with **long-term implications for gender equality,** human capital formation, and inclusive economic growth.
- **Precarious Conditions of Paid Care Workers:** Paid care workers such as domestic workers, Anganwadi workers, ASHA workers, and caregivers frequently face low wages, informal employment, and weak social protection.
  - The COVID-19 pandemic exposed this contradiction, where **care workers were labelled "essential" but continued to work without adequate pay**, insurance, or job security, reinforcing structural inequality within the care sector.
  - ASHA and Anganwadi workers are **categorized as "volunteers,"** denying them the legal status of "workers" and associated minimum wage protections.
    - Major 2024-25 protests highlighted that ASHAs **often earn only ₹2,000–₹3500 in fixed incentives monthly.**
- **Weak Fiscal And Policy Prioritisation Of Care:** India lacks a dedicated national policy for the **"Purple Economy,"** leading to chronic underfunding and fragmented interventions that fail to treat care as a public good.
  - Public spending in India is **still largely gender-neutral** and does not treat care infrastructure as a key economic investment. As a result, **spending on care services is spread thinly across different ministries**, with little coordination.

- Although the share of the **Gender Budget increased to 8.86% in FY 2025–26,** many critics point out that this **rise is mainly due to better classification of existing schemes rather than fresh spending** targeted specifically at women.
  - In practice, **schemes meant exclusively for women** have seen **only limited real growth**. This has left the **"Purple Economy"** without the sustained public investment.
- **Deep-Rooted Gender Norms And Social Expectations:** Care work is widely perceived as women's natural responsibility rather than skilled labour. Even when men participate, it is often seen as **"help" rather than shared responsibility.**
  - These entrenched norms **hinder redistribution of care between genders** and resist policy efforts aimed at achieving equality in household labour.

What Measures are Required to Strengthen India's Care Economy?

- **Recognise Care Work As Economic Work:** Governments can take an important step by formally acknowledging unpaid care and domestic work as a valuable economic contribution.
  - By gradually integrating care work into **policy discussions, development planning, and labour frameworks**, along the lines recommended by the International Labour Organization, care activities can be better understood, measured, and supported.
    - **Recognition is the first step toward visibility, valuation, and reform.**
- **Measure And Value Unpaid Care Work:** Regular **Time Use Surveys**, gender-disaggregated data, and **satellite national accounts** should be institutionalised to estimate the economic value of unpaid care work.
  - As emphasised by the Beijing Platform for Action, **what remains unmeasured continues to be ignored in budgeting and policy priorities.**
- **Invest In Care As Social Infrastructure:** Childcare centres, eldercare services, disability support, and mental health services should be treated as **core public infrastructure**, similar to roads or power.
  - **Increased public investment in care services** reduces women's unpaid workload and simultaneously creates decent employment opportunities, a strategy supported by **UN Women.**
- **Redistribute Care Responsibilities:** Care work must be shared more equally between women and men, and among households, the State, the market, and communities.
  - Policies such as **paid parental leave for both parents, flexible work arrangements, and awareness campaigns** can help shift care from being a women-only responsibility to a shared social obligation.
- **Reward And Protect Paid Care Workers:** Paid care workers, such as domestic workers, ASHA workers, Anganwadi workers, nurses, and caregivers should be brought under **formal labour protections.**
  - This includes minimum wages, social security, occupational safety, and career progression, consistent with ILO standards on **decent work in the care sector**.
- **Adopt Care-Sensitive Budgeting:** Public budgets should explicitly account for care-related spending and its gendered impact.
  - **Gender-responsive and care-sensitive budgeting** ensures that allocations for childcare, health, nutrition, and social protection are **seen as investments in economic productivity, not welfare expenditure.**
- **Support Women's Labour Force Participation:** Expanding affordable care services enables **women to enter, remain, and progress in paid employment.**
  - This directly contributes to economic growth, poverty reduction, and demographic dividend realisation, aligning with **Sustainable Development Goals**, especially **SDG 5.4** and **SDG 8**.
- **Address Care During Crises And Climate Stress:** Disaster response, pandemic planning, and climate adaptation strategies must include care dimensions.
  - **During crises, unpaid care burdens rise sharply;** strengthening public care systems improves societal resilience and prevents women from disproportionately absorbing shocks.

Comparative Global Practices for Care Economy
Bolivia
Constitutional Recognition of Household Work
Household work recognized as economic activity in the Constitution
Homemakers eligible for social security benefits
State responsibility towards care providers
Trinidad & Tobago
Counting Unremunerated Work Act, 1996
Measurement & monetization of unpaid work
Gender-disaggregated data collection
Unpaid work made visible in national accounts
Argentina
Pension Credits for Unpaid Care Work
Pension credits for women raising children
Bridging income & pension gaps
Care work recognized in social security

Conclusion:

Strengthening the care economy is essential for achieving **inclusive growth and gender equality**. Recognising, reducing, and redistributing care work directly advances **Sustainable Development Goals**, especially **SDG 5.4** on unpaid care and **SDG 8** on decent work. Investing in care as social infrastructure enhances human capital, labour productivity, and social resilience. A care-centred development approach is therefore not welfare-driven, but growth-enabling and future-ready.

India'S Aviation Sector and the Safety Imperative

This editorial is based on "Indian aviation safety, its dangerous credibility deficit" which was published in The Hindu on 06/01/2026. The article highlights how India's rapid aviation growth is being undermined by safety lapses, regulatory weaknesses, and a credibility deficit in accident investigation. It brings renewed focus on the urgent need for transparent oversight and institutional reform to restore public and global trust.

India's civil aviation sector is among the **world's fastest growing,** driven by **expanding connectivity and rising demand**. However, recent air accidents (eg, **Air India Flight 171 Ahmedabad Crash**) and regulatory lapses have exposed serious gaps in aviation safety, transparency, and institutional credibility. As a signatory to **International Civil Aviation Organization norms**, India is expected to ensure independent and timely safety oversight. **Persistent delays and opacity in investigations** have weakened public trust and global confidence. Restoring safety-first governance is now essential to sustain growth and protect lives.

What is the Current Status of the Aviation Sector in India ?

- **Expansion of Airports and Infrastructure:** India's airport infrastructure has grown **rapidly over the past decade**. The number of operational airports has more than **doubled from 74 in 2014 to around 163 by 2025**, reflecting aggressive infrastructure development and policy focus on connectivity.
  - The government has set an ambitious long-term vision to expand this network further to **350–400 airports by 2047**, anticipating exponential growth in demand and deeper regional penetration.
  - New greenfield projects such as the **Navi Mumbai International Airport** — which has started handling thousands of passengers shortly after its inauguration are key to enhancing capacity and reducing congestion at existing hubs.
- **Passenger Traffic and Market Size:** India has cemented its position as the **third-largest domestic civil aviation market globally**.
  - Passenger numbers continue to climb. For instance, **Indira Gandhi International (IGI) Airport in Delhi has been ranked 9th among the world's busiest airports** in 2024, handling 77.8 million passengers.
  - Domestic traffic has consistently stayed robust, with airports like Visakhapatnam and Bhopal recording **notable increases in passenger footfall and regional connectivity**
    - Airline capacity also reflects this growth, with both domestic and international seat deployments rising steadily.
- **Regional Connectivity:** The **UDAN (Ude Desh ka Aam Naagrik) initiative** has been transformational in boosting regional air connectivity.
  - Under this scheme, which primarily uses viability gap funding to make routes commercially viable, **over 625 regional routes have been operationalised**, linking more than **90 airports and aerodromes** including water aerodromes and heliports.
  - It has carried more than **1.56 crore passengers** so far, dramatically improving access to air travel from smaller towns and Tier-II/III cities.
    - Extensions like UDAN 2.0 plan to connect **120 more destinations** further entrenching connectivity deep into hinterlands.
- **Capacity, Fleet Growth and Economic Contribution:** To cater to rising demand, Indian carriers are aggressively expanding their fleets.

- Industry estimates suggest Indian airlines may **induct about 100 aircraft annually over the next 15 years**, underpinning long-term capacity growth.
- The sector's economic footprint is significant; it supports **over 7.7 million jobs indirectly, including 369,000 jobs directly**, and acts as a catalyst for tourism, trade, logistics and manufacturing ecosystems.
  - Furthermore, projections estimate the aviation market size at nearly **$15 billion in 2025**, with expectations of crossing over **$26 billion by 2030**.

What are the Regulatory Frameworks Governing the Aviation Sector?

- **Ministry of Civil Aviation (MoCA)-Policy and Strategic Control:**
  - The aviation sector is anchored institutionally under the Ministry of Civil Aviation, which **provides overall policy direction, legislative oversight, and strategic vision.**
  - MoCA formulates national aviation policies such as the **National Civil Aviation Policy (NCAP)**, oversees bilateral **air service agreements (ASAs)**, and steers flagship initiatives like UDAN and airport privatisation.
- Directorate General of Civil Aviation (DGCA)- Safety and Operational Regulator
  - The Directorate General of Civil Aviation is **India's primary technical regulator, responsible for air safety, licensing, certification, and operational oversight**.
    - It frames **Civil Aviation Requirements (CARs)** governing aircraft operations, pilot duty-time limitations, maintenance standards, and airline compliance.
    - DGCA also **issues Air Operator Certificates (AOCs)**, **approves aircraft** induction, and **conducts safety audits**.
- Aircraft Accident Investigation Bureau(AAIB)-Accident Investigation Authority
  - The Aircraft Accident Investigation Bureau is mandated to **investigate aircraft accidents** and serious incidents in line with ICAO **Annex 13**.
  - Its role is **purely technical**, aimed at identifying causes and issuing safety recommendations.
- Airports Authority of India (AAI)- Infrastructure and Air Navigation Services
  - The Airports Authority of India is a statutory body responsible for **airport infrastructure development and air navigation services (ANS)** across most of India's airports.
  - AAI manages runways, terminal facilities, air traffic control, and communication-navigation-surveillance (CNS) systems.
    - It plays a central role in **regional connectivity** by upgrading smaller airports under UDAN.
- Bureau of Civil Aviation Security(BCAS)- Aviation Security Regulator
  - The Bureau of Civil Aviation Security is responsible for **aviation security oversight**, including **passenger screening, access control, cargo security**, and compliance with international anti-terrorism norms.
  - **BCAS issues security directives to airlines, airports, and ground handlers,** and **coordinates closely with intelligence and law-enforcement agencies**.
- **Legislative Provisions:**
  - **Bhartiya Vayuyan Adhiniyam, 2024:** The **Act replaces the Aircraft Act, 1934** to modernise India's civil aviation framework by streamlining regulation under DGCA, strengthening safety oversight, and updating penalties.
    - It aligns India's aviation laws with ICAO standards to support safe, efficient, and globally credible aviation growth.
  - **Protection of Interest in Aircraft Objects Act, 2025:** Strengthens India's aviation regulatory framework by **plugging enforcement gaps in the Cape Town Convention**, providing legal certainty to aircraft leasing and financing.
    - It enhances **creditor rights, repossession, and deregistration mechanisms**, reducing legal risk and improving compliance scores.
- International Framework-ICAO and Global Obligations

- India is a **contracting state** to the **International Civil Aviation Organization (ICAO)** and is **bound by its Standards and Recommended Practices (SARPs)**.
  - These **cover aircraft certification, airworthiness, safety management systems, accident investigation, and environmental norms.**
- India's aviation laws, CARs, and investigative procedures are **expected to align with ICAO Annexes, especially Annex 13 on accident investigation**.
  - Compliance with the **Chicago Convention directly affects India's global aviation standing, insurance premiums, aircraft leasing costs,** and the level of trust and cooperation extended by other countries in international air operations..

What are the Key Issues Associated with India's Aviation Sector ?

- **Aviation Safety Deficit and Credibility Concerns:** Despite being a signatory to the International Civil Aviation Organization, India has struggled with timely, transparent, and technically robust investigations, eroding domestic and global confidence.
  - **Delays in final reports and ambiguous preliminary findings fuel speculation** and misinformation, **while ICAO's USOAP audits have flagged gaps in surveillance and enforcement.**
  - The **June 2025 Ahmedabad crash**, where the AAIB's preliminary report was delayed and final disclosures remain slow, has further raised concerns among industry and pilot bodies about the credibility of India's safety oversight.
- **Infrastructure Capacity and Operational Stress:** Although India has expanded its airport network significantly, capacity constraints persist at major hubs like Delhi and Mumbai.
  - Congested airspace, limited runway availability, and stretched air traffic control systems increase operational risks and delays.
    - **For example,** the **Airports Authority of India (AAI) has had to limit runway movements at Mumbai Airport because its single runway is operating at or beyond scheduled capacity**, causing aircraft to *circle in congested airspace* and increasing fuel burn and delays.
  - Many **regional airports** under UDAN face issues such as **low passenger demand, inadequate firefighting services, and weather-related operational challenges**, raising questions about long-term viability.
- **Financial Stress and Airline Sustainability Issue:** Indian airlines operate in a **high-cost**, low-margin environment, burdened by **high aviation turbine fuel (ATF) taxes**, **airport charges, and leasing costs**.
  - **For example**, ATF accounts for around **40–45 % of an airline's operating expenses** in India and is taxed by states at rates up to **30%, magnifying cost burdens** compared with global peers.
  - The **insolvency of Go First in 2023** and the grounding of its entire fleet exposed how **financial stress can quickly translate into operational disruption**, affecting employees, lessors, and consumer confidence.
- **Environmental Sustainability and Climate Pressure:** Aviation is a growing contributor to carbon emissions and noise pollution. India has committed to global climate goals, yet adoption of **Sustainable Aviation Fuels (SAF)**, carbon offset mechanisms, and green airport design remains limited.
  - For instance, India has set **formal targets to blend Sustainable Aviation Fuel (SAF)- 1 % by 2027, 2 % by 2028, and 5 % by 2030 for international flights** as part of its efforts to align with global climate goals under ICAO's emissions frameworks such as CORSIA.
    - However, **actual SAF deployment remains very limited**, with production infrastructure still scaling up and costs significantly higher than conventional jet fuel, highlighting the **gap between commitments and on-ground implementation**.

- **Weak Enforcement of Passenger Rights and Erosion of Consumer Trust:**: While the **DGCA Passenger Charter mandates compensation, meals, accommodation, refunds, and alternate travel arrangements** for delays and cancellations, many passengers remain unaware of their rights, and uneven enforcement means airline compliance and consumer satisfaction often fall short of regulatory intent
  - For instance, **recent large-scale flight cancellations by IndiGo in 2025**, which stranded thousands of passengers across major airports due to crew and operational constraints, highlighted persistent gaps in contingency planning and passenger care.
- **Fragmented Governance and Poor Coordination:** India's aviation ecosystem involves several bodies such as the **Ministry of Civil Aviation (MoCA), DGCA, AAI, BCAS, and AAIB** , each with distinct mandates, but **coordination gaps have been repeatedly highlighted by Parliamentary reviews** as undermining effective oversight and response.
  - **Department-Related Parliamentary Standing Committee's 380th Report** on civil aviation safety explicitly flagged deficiencies in regulatory oversight and enforcement linked to institutional fragmentation and lack of clarity in responsibilities across these agencies.
  - **DGCA faces limited autonomy, acute manpower shortages, and excessive executive control,** weakening its effectiveness.
    - As of August 2025, a **50% manpower deficit has severely constrained inspections, audits, and enforcement.**
- **Hangar & MRO Deficit:** India faces a severe shortage of hangars and **Maintenance, Repair and Overhaul (MRO)** facilities, particularly for wide-body aircraft. As a result, airlines are compelled to undertake heavy maintenance overseas due to limited domestic capacity.
  - This dependence significantly **increases operational costs and turnaround time** for carriers.
  - It also leads to an **annual foreign exchange outflow of nearly $1.5 billion,** undermining the goal of aviation self-reliance.

What Measures are Needed to Strengthen India's Aviation Sector?

- **Establish an Independent and Empowered Aviation Safety Regulator:** India must move towards a **functionally autonomous aviation safety regulator**, insulated from political and commercial pressures.
  - Parliamentary Standing Committees have repeatedly recommended **separating policy-making from safety oversight**.
    - This will **improve enforcement credibility, reduce regulatory capture,** and ensure that safety norms are applied uniformly rather than selectively.
- **Reform Accident Investigation for Transparency and Trust:** The Aircraft Accident Investigation Bureau must be strengthened **in line with International Civil Aviation Organization (ICAO) Annex 13.**
  - Measures include **fixed timelines for preliminary and final reports**, **modern forensic labs, protected tenure for investigators**, and **mandatory public briefings.**
  - **Transparent investigations** restore public trust, **counter misinformation**, and **improve global credibility**, which directly affects leasing costs and international cooperation.
- **Upgrade Airport Infrastructure with Safety-First Planning:** Airport expansion should prioritise operational readiness over numerical growth. This includes **ensuring adequate runway safety areas, round-the-clock rescue and firefighting services, modern navigation aids, and weather resilience.**
  - **Regional airports under UDAN require realistic traffic assessments, better last-mile connectivity, and phased operations**.
  - CAG reports have stressed that **infrastructure must be aligned with actual operational demand**.
- **Strengthen Human Capital and Safety Culture:** India needs massive investment in **training pilots, engineers, air traffic controllers, and safety inspectors**.

- **Duty-time** regulations must strictly **account for fatigue, circadian rhythm disruption, and mental health**, as highlighted by ICAO and DGCA studies.
- Encouraging a **non-punitive safety reporting culture**, where crew can report errors without fear, is essential. **Human factors, not technology alone,** remain the weakest link in aviation safety worldwide.
- **Ensure Financial Sustainability of Airline:** Rationalising ATF taxation under GST, promoting domestic aircraft leasing hubs (like GIFT City), and **encouraging Maintenance, Repair and Overhaul (MRO) ecosystems** can reduce costs.
  - **Financially stable airlines** are more likely to **invest in training, maintenance,** and safety rather than short-term cost-cutting.
- **Improve Airspace Management and ATC Capacity:** Congested airspace around major hubs increases delays and operational risk. India must **modernise air traffic management through satellite-based navigation, flexible airspace use, and civil–military coordination.**
  - Increasing ATC staffing and upgrading **communication, navigation, and surveillance (CNS) systems** are critical as flight movements continue to rise sharply.
- **Integrate Environmental Sustainability into Growth:** India's aviation growth must align with climate commitments. Promoting **Sustainable Aviation Fuels (SAF),** energy-efficient airport design, and ICAO's CORSIA framework can reduce emissions.
  - **Incentives for green airports and carbon reporting mechanisms** will ensure that growth does not come at the cost of long-term environmental damage.
- **Strengthen Passenger Rights and Service Quality:** Robust enforcement of passenger charters, transparent fare rules, and effective grievance redressal mechanisms are essential to sustain public confidence.
  - **Digital platforms** for **real-time complaint tracking** and **penalties for repeated violations** can bridge the gap between regulation and passenger experience.
  - A mature aviation market **must protect consumers alongside promoting growth.**
- **Improve Institutional Coordination and Crisis Management:**
  - Clear protocols for coordination among MoCA, DGCA, AAI, AAIB, and state agencies are essential, especially during accidents or major disruptions.
  - **Regular mock drills**, **crisis communication frameworks**, and defined command chains can prevent chaos and loss of evidence.
- **Adopt a Long-Term Aviation Vision**: India needs a long-term aviation roadmap aligned with **Vision 2047 that integrates infrastructure, safety, sustainability, human resources, and global competitiveness.**
  - **Growth targets must be matched with regulatory capacity** and institutional readiness to avoid systemic stress.

Conclusion:

India's aviation sector stands at a critical crossroads where rapid expansion must be matched by equally strong governance and institutional capacity. **Sustainable growth** will depend on **independent regulation, transparent safety oversight**, and investment in human and technological capabilities. Aligning infrastructure development with environmental responsibility and passenger welfare is essential for long-term resilience. **A safety-first, credibility-driven aviation ecosystem is vital to secure public trust and India's global standing.**

MSMEs- The Backbone Of India'S Economy

This editorial is based on "MSMEs and their economic footprint in India's journey to Viksit Bharat" which was published in The Business Standard on 01/01/2026. The article highlights the contribution of MSME in the economic growth of the country. Further it argues how MSME are key to realising the dream of Viksit Bharat.

Micro, Small and Medium Enterprises (MSMEs) form the backbone of India's productive economy, anchoring growth, employment, and regional balance in the journey towards *Viksit Bharat*. Contributing **nearly one-third of India's GDP** and **about 45% of manufacturing output**, MSMEs act as vital linkages between agriculture, industry, and services. They are the largest generators of non-farm employment, especially for women, youth, and informal workers, thereby deepening social and economic inclusion. As engines of innovation, local entrepreneurship, and export competitiveness, MSMEs **enhance India's resilience in a volatile global economy**. Strengthening this sector is thus not merely an economic imperative but a strategic pathway to sustainable, inclusive, and self-reliant national development.

What Constitutes the Micro, Small, and Medium Enterprises (MSME) Sector in India?

- **About**: **Micro, Small and Medium Enterprises (MSMEs)** are business entities engaged in **manufacturing, processing, or providing services**, classified on the basis of their **investment in plant & machinery/equipment and annual turnover**, as defined under India's MSME framework.

New classification of MSME

Type	INVESTMENT		TURNOVER	
	Current	Revised	Current	Revised
MicroEnterprise	Rs 1cr	Rs 2.5cr	Rs 5cr	Rs 10cr
Small Enterprise	Rs 10cr	Rs 25cr	Rs 50cr	Rs 100cr
Medium Enterprise	Rs 50cr	Rs 125cr	Rs 250cr	Rs 500cr

Source: Budget 2025-2026, Speech of Nirmala Sitharama, Union Minister of Finance February 1, 2025.

What Makes the MSME Sector Central to India's Economic Structure?

- **Strengthening Industrial Clusters and Economic Output:** MSMEs contribute **around 30.1% of India's GDP**. Further **MSME accounts for 35.4% of manufacturing in the country**.
  - They act as suppliers of raw materials, components, and intermediate goods to large industries, strengthening **industrial clusters** such as auto, textiles, and pharmaceuticals.
  - Rapid formalisation via the Udyam Portal with **over 7 crore registrations as of January 2026** has expanded their role in structured and tax-compliant growth.
- **Engines of Employment and Inclusive Livelihood:** The micro, small, and medium enterprises (MSMEs) in India contribute **62% to employment.**
  - Digitalisation and fintech platforms have expanded and simplified credit access for micro-enterprises, while targeted government initiatives such as **Pradhan Mantri Mudra Yojana, PM Vishwakarma, Stand-Up India, PM SVANidhi**, and the **Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE)** have collectively strengthened self-employment, formalisation, and grassroots entrepreneurship across urban and rural India.
- **Accelerating Digitalisation and Technology-Driven Growth:** Indian MSMEs are steadily evolving into **digitally integrated and technology-oriented enterprises**, with a large share of payments, procurement, and customer interactions now conducted through digital modes.
  - Platforms such as the Open Network for Digital Commerce (ONDC) are democratising e-commerce by lowering entry barriers, while

the **RBI's Public Tech Platform for Frictionless Credit** is enabling faster, data-driven, and largely collateral-free lending to small businesses.
    - Growing MSME participation in **aerospace supply chains, pharmaceutical manufacturing clusters**, and **electronics and defence production ecosystems** highlights the sector's expanding innovation capacity and its role in building technologically resilient domestic industries.
- **Enhancing India's Export Competitiveness:** MSMEs constitute a critical pillar of India's external trade, with a strong presence in export-oriented sectors such as textiles, leather, gems and jewellery, engineering goods, pharmaceuticals, and processed foods.
    - In 2023–24, MSME-associated products accounted for **45.73% of India's total exports**, reflecting their cost efficiency, adaptability, and ability to cater to diverse international markets.
- **Advancing Women-Led and Social Entrepreneurship:** Women-led MSMEs are increasingly emerging as **catalysts of gender-inclusive growth, livelihood security,** and social empowerment.
    - Credit and enterprise-support initiatives such as **Pradhan Mantri Mudra Yojana, Stand-Up India, DAY–NRLM, and Mahila Coir Yojana** have significantly expanded access to finance, skills, and markets for women entrepreneurs, particularly in rural and semi-urban areas.
    - By integrating self-help groups, home-based workers, and social enterprises into formal value chains, the MSME ecosystem is playing a critical role in **democratising entrepreneurship, enhancing social mobility, and advancing inclusive development outcomes**.
- **Revitalising Rural Livelihoods and Agri-Based MSME Ecosystems:** Rural and agri-based MSMEs play a pivotal role in **strengthening the village economy**, curbing distress-driven migration, and creating **non-farm employment** through activities such as agro-processing, food and dairy industries, handicrafts, fisheries, and forest-based enterprises.
    - Government interventions such as **PM Vishwakarma**, the **Self-Reliant India (SRI) Fund**, **PM Formalisation of Micro Food Processing Enterprises (PMFME)**, and cluster-based initiatives are accelerating rural industrialisation and enterprise formalisation.
- **Promoting Green, Resilient, and Sustainable MSME Growth:** MSMEs are increasingly becoming key enablers of India's shift towards **green growth and circular economy practices** by adopting renewable energy solutions, energy-efficient machinery, waste recycling, and cleaner production processes.
    - National initiatives such as the Raising and Accelerating MSME Performance (RAMP) **Programme**, supported by multilateral institutions, along with schemes like **ZED Certification**, **Energy Efficiency Financing Platform**, and forward-looking state policies like **Telangana's MSME Policy**, are mainstreaming sustainability, compliance, and resource efficiency into MSME growth pathways, **aligning economic competitiveness with environmental responsibility.**

What are the Key Issues Associated with India's MSME Sector?

- **Incomplete Formalisation & Informality:** Although over **7 crore MSMEs are registered on the Udyam Portal**, NITI Aayog's Report on India's MSMEs highlight that **nearly 90% of MSMEs** continue to operate in the informal sector, reflecting the sector's high degree of fragmentation.
    - **Compliance fear, low digital literacy, and cost of formalisation deter registration**, restricting access to institutional credit, insurance, export incentives, and government procurement.
- **The "Missing Middle" and Stunted Scalability:** The sector is characterized by a **"pyramid" structure** where the **majority of units are micro-enterprises** that fail to transition into small or medium categories **due to regulatory "cliff-effects."** Businesses often **intentionally stay small to avoid complex labor laws** and tax compliance that kick in once they cross specific turnover or employment thresholds.

- For example, **95% of registered MSMEs remain in the "Micro or Small" category.** While the **Union Budget 2025-26 raised classification limits**, the "**missing middle" persists**.

- **Delayed Payments & Working Capital Stress:** Delayed payments remain one of the most critical operational bottlenecks. **Payments totalling ₹21,108 crore to micro, small and medium enterprises (MSMEs) are pending** across 90,000 applications, as per the latest data from the **MSME Samadhaan portal**.
  - Weak enforcement forces MSMEs into distress borrowing, disrupting wage payments and production cycles.
- **Productivity Constraints and Technological Gaps:** MSMEs continue to face **structural productivity constraints** due to **low capital intensity, outdated machinery, and limited access to advanced technologies**. Inadequate digital integration and weak quality certification reduce their ability to compete in high-value domestic and global markets.
  - Technology adoption remains uneven, with benefits concentrated in a small segment of enterprises. As a result, **a large proportion of MSMEs remain trapped in low-productivity, low-income equilibria.**
  - According to the **MSME Annual Report 2024-25** , the **RAMP programme** (which includes technology upgradation, digitisation and innovation support) *is* envisaged to benefit about **5.5 lakh MSMEs**, a small fraction relative to the millions of MSMEs , which means **many MSMEs remain outside the ambit of structured technology upgradation support**.
- **Persistent Credit Constraints and Limited Formal Finance**: Despite multiple schemes, MSMEs continue to face a **structural credit gap of ₹25–30 lakh crore** (RBI–IFC estimate).
  - **Informal borrowing** remains prevalent, **with 12% of micro enterprises, 3% of small industries, and 2% of MSMEs overall still relying on informal lending sources**, leading to high interest burdens.
  - While **Pradhan Mantri Mudra Yojana** expanded access, micro enterprises **still receive small-ticket, short-tenure loans**, limiting capital formation and scale.
- **Skill Gaps & Human Capital Constraints:** As per **NSDC and Periodic Labour Force Survey (PLFS)** data, a majority of MSME workers remain **informally trained**, with low exposure to modern manufacturing and digital skills.
  - According to the National Skill Development Corporation (NSDC) around **47 per cent of businesses** said **they struggle to find employees with the right skill sets**. This is **exacerbated in sectors like manufacturing and IT-enabled services**, where specialised talent is essential for growth.
  - High labour turnover and weak apprenticeship linkages reduce enterprise efficiency, particularly in export-oriented and technology-intensive sectors.
- **Regulatory & Compliance Burden:** Multiple compliances under **GST, labour codes, environment laws, and local regulations** impose disproportionately high costs on small firms.
  - A detailed report by **TeamLease Regtech** highlights that India's MSMEs, especially manufacturing units , must comply with **over 998 unique regulatory obligations and 1,450 total requirements annually**, covering tax, labour, environment, industry, and local statutory norms.
    - Many of these include **over 480 clauses that could attract imprisonment for procedural lapses**, further increasing risk for small firms.
- **Market Access & Scale Limitations:** Most MSMEs operate in **local or regional markets**, lacking branding, logistics, and marketing capacity.
  - While **Government e-Marketplace** has expanded access, micro enterprises face challenges related to documentation, quality standards, and price competition, limiting their effective participation.

- A **SIDBI sector survey** finds that a large share of Indian MSMEs **continue to rely on traditional/ local modes of marketing (~70% in the sample survey**), which hinders their ability to expand into wider domestic or foreign markets.
  - This slow uptake of modern channels limits visibility, branding and customer reach
- **Export Competitiveness Constraints:** Though MSMEs contribute 45.73% of India's exports (2023–24), DGFT and Commerce Ministry data highlight issues such as high **logistics costs, lack of export finance, and difficulty meeting ESG and quality norms**.
  - The **Commerce Ministry** has flagged that small exporters struggle to meet emerging ESG norms, carbon disclosure requirements, and product traceability standards (**EU CBAM, sustainability-linked sourcing**), due to high certification and compliance costs.
  - Since much of Indian manufacturing is still **dependent on coal-fired energy,** its exporters will **face CBAM rates of between 20%-35% in the EU.**
- **Green Transition & Sustainability Challenges:** A **large proportion of MSMEs face constraints in adopting clean energy solutions and circular economy** practices due to limited financial capacity, inadequate technical expertise, and low awareness of green technologies and sustainability standards.
  - Due to this, MSMEs contribute significantly to India's carbon footprint, accounting for **10-15% of industrial sector emissions.**
  - Without targeted green finance and technology support, MSMEs risk exclusion from future export markets driven by ESG norms.

What Measures can be Adopted to Strengthen India's MSME Sector?

- **Deepening Access to Affordable & Timely Credit:** Bridging the MSME credit gap requires shifting from collateral-based lending to cash-flow and data-driven finance.
  - Full operationalisation of **RBI's Public Tech Platform for Frictionless Credit**, expansion of **CGTMSE coverage**, and development of MSME-focused credit scoring models using **GST, Udyam and bank data** can lower risk perception. Long-term credit at reasonable rates is essential for capital formation, not just survival lending.
- **Ensuring Time-bound Payments & Strong Enforcement:** Delayed payments must be addressed through automatic enforcement mechanisms under the MSME Act.
  - **Mandatory integration of large buyers and PSUs with the MSME Samadhaan** system, interest auto-accrual on delayed dues, and stricter penalties for habitual defaulters can ease working capital stress.
    - Fast-track MSME facilitation councils can improve dispute resolution efficiency.
- **Simplifying Compliance & Reducing Regulatory Burden**: **A single-window, risk-based compliance framework** should replace multiple inspections and filings.
  - Stabilising regulatory changes, and extending self-certification for low-risk MSMEs can reduce transaction costs.
  - Digitisation of approvals and decriminalisation of minor offences will encourage scaling up rather than remaining small.
- **Accelerating Technology Upgradation & Productivity:** Technology adoption must move beyond subsidies to cluster-based solutions. Expanding **common facility centres (CFCs),** shared R&D labs, and plug-and-play industrial infrastructure can raise productivity.
  - **Targeted incentives for automation, quality certification, and Industry 4.0** tools will help MSMEs integrate into global value chains.
- **Strengthening Skilling, Apprenticeship & Human Capital:**
  - MSME growth requires a demand-driven skilling ecosystem aligned with local industry needs.
  - Expanding apprenticeships, modular short-term skilling, and recognition of prior learning can address skill gaps.

- **Industry–ITI–MSME linkages** should be strengthened to ensure continuous upgradation of workforce capabilities.
- **Expanding Market Access & Scale:** MSMEs need support to move from **local markets to national and global platforms**. Simplified **onboarding and handholding** on platforms like **GeM and ONDC,** logistics support, branding assistance, and export facilitation desks can improve market reach.
  - Encouraging MSME participation in **public procurement and large private supply chains** will drive scale.
- **Boosting Export Competitiveness:** Dedicated export finance windows, assistance for meeting **global quality and ESG standards**, and **cluster-based export hubs** can improve MSME export performance.
  - Trade facilitation through **digital documentation**, reduced logistics costs, and targeted market intelligence will help MSMEs withstand global competition.
- **Strengthening Rural & Agro-based MSMEs**: Rural MSMEs should be integrated with **value addition, food processing, and agri-logistics ecosystems.**
  - Improved access to **storage, cold chains, digital marketplaces, and credit guarantees** can reduce migration and boost rural incomes.
  - Artisan and traditional enterprise clusters should be promoted for modern design, branding, and global market linkage.
- **Supporting Green Transition & Sustainable MSMEs:** The shift to sustainability requires **dedicated green MSME finance**, interest subvention for renewable energy adoption, and affordable access to clean technologies.
  - Capacity building on **ESG norms, carbon accounting**, and **circular economy** practices will help MSMEs **remain export-competitive in a low-carbon global economy.**
- **Enhancing Institutional Coordination & Governance**: Better coordination between the Union, States, financial institutions, and industry bodies is crucial. Outcome-based monitoring of schemes, real-time dashboards, and feedback-driven policy design can improve effectiveness.
  - Strengthening MSME clusters through local governance institutions will improve last-mile delivery.

Conclusion:

Strengthening MSMEs is central to achieving **Viksit Bharat@2047**, with clear targets of **raising MSME contribution to GDP ,creating quality jobs**, and **enhancing their share in exports beyond 60%**. Bridging the credit gap, ensuring timely payments, accelerating digital and green transitions, and enabling scale will be decisive. **A globally competitive, sustainable, and inclusive MSME ecosystem can transform India's demographic and entrepreneurial potential into long-term economic leadership.**

U.S. Actions in Venezuela and Crisis Of Multilateralism

This editorial is based on "The Venezuela test for UN & international law" which was published in The Hindustan Times on 07/01/2026. The article brings into picture the U.S. operation in Venezuela, conducted without UN authorization, challenging international law and Global South protections. For India, it underscores concerns over the credibility of frameworks upholding sovereignty and multilateralism.

The recent **U.S. Operation Absolute Resolve,** resulting in the arrest of the Venezuelan President, has revived serious debates over the **prohibition on the use of force in international law.** Although Washington presents the action as law enforcement, it involved the use of military force on sovereign territory without UN Security Council authorization. Such unilateral actions disproportionately endanger Global South states that depend on **Charter-based safeguards against power asymmetries.** For India, a consistent advocate of multilateralism and territorial sovereignty and a leading voice seeking greater representation in the UN Security Council, this development raises serious concerns about the **weakening credibility and effectiveness of international legal frameworks.**

What are the Potential Factors Behind the U.S. Actions Against Venezuela?

- **Geopolitical Strategy- The "Don-roe" Doctrine:** A primary driver is the reassertion of U.S. dominance in the Western Hemisphere.
  - The recent US administration has explicitly referenced the Monroe Doctrine (the 1823 policy opposing European/external interference in the Americas), which is now being called as **"Don-roe Doctrine."**
  - The U.S. views Venezuela's close ties with **Russia, China, and Iran** as a direct threat to regional security.
    - For instance, **China has loaned over $60 billion to Venezuela since 2007**. The U.S. views these loans as "predatory lending" designed to create a permanent dependency.

- **Resource Security and Oil Strategy:** Venezuela sits atop the world's largest proven oil reserves **(estimated at 303 billion barrels).** U.S. actions are heavily influenced by the desire to secure and stabilize these energy inputs.
  - In December 2025, the U.S. President asserted that Venezuela should return oil, land, and other assets which he claimed had been taken from the United States.
  - By **"running" or overseeing the transition in Venezuela,** the U.S. gains significant leverage over global oil prices.
    - The administration's goal is to increase production of **heavy, sour crude**, which U.S. Gulf Coast refineries are specifically designed to process, to lower energy costs for America.
- **Law Enforcement and "Narco-Terrorism":** The U.S. has increasingly framed its actions not just as diplomacy, but as a criminal justice matter.
  - Nicolás Maduro and several high-ranking officials were indicted in U.S. federal courts on charges of **narco-terrorism conspiracy**.
  - The U.S. claims the **"Cartel of the Suns" (allegedly run by Venezuelan officials)** collaborated with groups like the FARC to flood the U.S. with cocaine.

Does a "Law Enforcement" Objective justify the Use of Military Force on a Sovereign Territory?

- **Arguments In Favor:**
  - Proponents of the U.S. action argue that traditional laws of war must evolve to meet modern, "hybrid" threats that do not involve traditional armies.
  - **Functional Equivalence to an "Armed Attack":** The U.S. argues that the "invasion" of fentanyl and the activities of state-sponsored gangs cause more American deaths annually than a conventional military strike.
    - By labeling this **"Narco-Terrorism,"** the administration frames the drug flow as **an attack under Article 51 of the UN Charter,** justifying a military response in self-defense.
- **Article 42 of the UN Charter** empowers the Security Council to authorize military action (air, sea, or land forces) to maintain or restore international peace and security when non-military measures (Article 41) are inadequate.
- Critics maintain that the **U.S. attempt to bypass the Security Council framework** undermines the collective security system envisioned under the UN Charter and risks normalizing the use of force based on unilateral threat perceptions.
  - **The "Unwilling or Unable" Doctrine:** This legal theory suggests that if a sovereign state (Venezuela) is either unwilling to stop criminal groups on its soil or is actively collaborating with them, **it forfeits its right to absolute sovereignty.**
    - In this view, the **U.S. isn't "invading" a country; it is "neutralizing" a threat that the local government refuses to handle**, effectively acting as a global policeman where the local system has failed.
  - **The Ker-Frisbie Doctrine:** From a purely U.S. legal perspective, the "how" of a capture does not matter as much as the "who."
    - Under the **Ker-Frisbie** precedent, U.S. courts have ruled that even if a defendant (like Maduro) is brought to the U.S. through a military force, the court still has the authority to try them.
    - This creates a powerful domestic incentive to use force to bypass slow or blocked extradition processes.
- **Arguments Against:**
  - Critics, including the UN Secretary-General and various international legal bodies, argue that using the military for law enforcement is a **"dangerous precedent" that destroys the global order.**
  - **Violation of Article 2(4) of the UN Charter:** The bedrock of international law is the prohibition

of the use of force against the **territorial integrity** of any state.

- Law enforcement is a domestic power. Critics argue that if any nation can claim "crime" as a reason to invade a neighbor, the concept of a sovereign border becomes meaningless, **leading to a "law of the jungle" where the strongest nations act without restraint.**

- **Lack of "Kinetic" Threshold:**
- International law defines an **"armed attack" as a physical military strike (bombs, troops, missiles).**
  - Most legal scholars reject the idea that narcotics or migration can be "re-branded" as an armed attack.
  - By doing so, the U.S. is accused of **"legal gymnastics"**, changing the definitions of words to justify an operation that is, in reality, a regime change mission.
- **Evasion of the International Criminal Court (ICC):** Opponents argue that if the U.S. were truly interested in "justice" and "human rights," it would have supported the ICC's existing investigations into Venezuela rather than launching a unilateral raid.
  - By capturing a head of state for trial in a New York court, the **U.S. is seen as prioritizing its own political interests and narcotics laws** over the established international framework for prosecuting mass atrocities.

What are the Implications of the U.S.–Venezuela Tensions for India?

- **Energy Diversification and Refining Strategy:** The immediate impact on India's energy security remains muted because India has proactively diversified its oil basket away from Venezuela to avoid secondary U.S. sanctions.
  - Recent data shows **Venezuela's share in India's crude basket has contracted drastically, falling to around 0.3% in FY2026 (April–October 2025)** from a much higher share in earlier years due to sanctions and trade barriers.
  - **Now India awaits clarity on a possible new supply regime under U.S. oversight** as India's refining sector, especially highly complex facilities such as **Reliance Industries' Jamnagar complex**, is technically suited to process Venezuela's heavy-sour "Merey" crude.
- **Unlocking Stalled Upstream Sovereign Assets: I**ndia's state-owned **ONGC Videsh (OVL)** has long-standing investments in Venezuelan oil fields that have been **"zombie assets" due to payment blockades.**
  - For instance, OVL holds equity stakes in two Venezuelan oil fields: **San Cristóbal (40% stake) and Carabobo-1 (11% stake)**. These projects have been troubled by low output and sanctions.
  - A U.S.-led restructuring of the Venezuelan oil sector can allow for the repatriation of massive unpaid dividends.
- **Geopolitical Balancing and Strategic Autonomy:** The intensification of U.S. engagement in Venezuela places India in a **diplomatic balancing act**.
  - New Delhi must carefully manage its relationship with Washington while also **respecting its longstanding principles of sovereignty and non-interference**.
  - Official Indian statements have expressed concern over developments without directly condemning any party, reflecting a cautious approach that prioritizes broader strategic interests.
- **Macro-Economic and Oil Market Effects:** While India's current direct trade with Venezuela is limited, any change in Venezuelan oil production and export dynamics could affect **global crude pricing**.
  - Venezuela holds among the largest proven oil reserves globally, and increased output under a more stable framework could put downward pressure on international oil prices over the medium to long term.
    - The situation also underscores the **failure of multilateral institutions like the UN to check unilateral interventions,** leaving India and other Global South nations vulnerable to disruptions in energy supplies and global strategic dynamics.

Why are Multilateral Organizations Like the UN Failing to Prevent Unilateral Military Interventions?

- **Structural Paralysis- The "Veto Trap":** The UN Security Council (UNSC) is structurally incapable of acting when a Permanent Member **(P5) is the aggressor or protects the aggressor.**
  - Because the **U.S., Russia, and China** utilize their veto to shield their respective strategic interests, the council has devolved from a security guarantor into a forum for deadlock.
  - For instance, Between 2015 and 2024, a total of 47 vetoes were cast in connection with 37 draft resolutions and amendments.
- **Legal Reinterpretation- "Law Enforcement" as a Loophole:** Strong nations are increasingly bypassing the UN Charter's prohibition on the use of force (Article 2(4)) by re-branding military invasions as "transnational law enforcement."
  - By framing interventions as **"surgical criminal extractions" rather than acts of war,** states circumvent the need for UN approval while claiming a "moral" right to act.
  - For instance, the **U.S. justified "Operation Absolute Resolve" in Venezuela** by citing **Article 51 (Self-Defense)** against "narco-terrorism".
- **Financial Coercion-The Liquidity Crisis:** Multilateralism is failing because the UN is currently facing its worst liquidity crisis in history, **leaving it without the "teeth" to monitor or intervene in fast-moving conflicts.**
  - When the world's largest donors withhold assessed contributions to signal displeasure with UN policy, the organization loses the operational capacity to deploy peacekeepers or neutral observers.
  - With a rising shortfall in contributions, **$2.4 billion in unpaid regular budget dues and $2.7 billion in peacekeeping funds**, the UN has been compelled to reduce spending, freeze recruitment, and scale back certain services.
- **Rise of Regionalism:** Multilateralism is also failing because the world has shifted from a "universal" security model to a fragmented one **where regional blocs prioritize their own rules over UN mandates.**
  - As the UN is viewed as too slow and geographically disconnected, smaller, exclusive alliances are taking direct action to secure their own spheres of influence, often excluding the UN entirely.
  - Interventions without UNSC approval have been conducted by a myriad of regional organizations, including the **A.U., the North Atlantic Treaty Organization (NATO), and the** Economic Community of West African States (ECOWAS).
- **Normative Erosion- The "Accountability Vacuum":** Multilateralism is fading because the nature of conflict has shifted toward **"gray zone" aggression**, including the use of **Private Military Companies (PMCs)** and cyber-warfare, which purposefully operates outside the UN's traditional definitions of "war."
  - Because the **UN Charter was designed to regulate visible state-on-state military action**, it **lacks a binding framework to hold states accountable for "deniable" force** or non-kinetic attacks that cripple a nation's stability without firing a shot.
  - For instance, the **2017 NotPetya cyber-attack,** which originated in Ukraine but rapidly spread globally, disrupted businesses, hospitals, and government systems worldwide, causing billions in damages.
    - It illustrates how cyber operations can inflict widespread harm, blur accountability, and challenge traditional frameworks for international intervention.

How Can Multilateralism be Reformed to Promote a Fair and Just Global Order?

- **Strengthening Legal Clarity and Closing Loopholes:** International law must evolve to **explicitly distinguish between criminal law enforcement and the use of force,** removing the "self-defense against non-state actors" ambiguity.

- Clearer codification can prevent powerful states from rebranding military aggression as counter-narcotics or counter-terrorism operations.
- **Treaty-based reforms could incorporate a "threshold of harm" principle,** defining what constitutes a justifiable cross-border intervention.

- **Revitalizing the UN Security Council and Reforming the Veto:** Reforming UNSC procedures, such as **introducing a "veto override" mechanism for mass atrocities or egregious unilateral interventions,** can restore credibility.
  - Rotational or weighted veto systems could limit the ability of P5 states to shield themselves from accountability.
  - Enhancing transparency in deliberations and obligating public justification for vetoes can pressure permanent members to act responsibly.
  - **Structural reform must align with the principle of collective security while protecting smaller nations' voices**. Strengthened decision-making ensures the UN is not sidelined by superpower impasses.
- **Incentivizing Compliance Through Financial and Trade Levers:** States that act in violation of **multilateral norms** can be subjected to **calibrated economic disincentives, including access to international financial systems and trade forums.**
  - Embedding incentives into global economic architecture aligns national interests with collective rules.
  - This approach leverages the interconnected global economy to enforce norms without relying solely on military checks. Financial leverage becomes a practical tool for norm adherence.
- **Codifying Accountability for Gray-Zone and Hybrid Threats:** Multilateral frameworks must explicitly address hybrid aggression, including cyber-attacks, proxy conflicts, and private military interventions.
  - Creating a **binding "gray-zone accountability protocol"** ensures states cannot exploit technological or non-kinetic warfare to bypass legal scrutiny.
  - Independent verification agencies could monitor violations and recommend proportionate sanctions. **Such codification bridges the gap between traditional war law and modern realities**. It protects vulnerable nations from subtle, destabilizing interventions.
- **Embedding Transparency and Normative Surveillance in Global Governance:** Multilateral institutions should adopt continuous monitoring of international military, economic, and cyber actions through open-access reporting platforms.
  - **Real-time data on troop movements, sanctions, and cyber incidents** increases accountability and deters covert operations.
  - **Independent auditing by neutral experts** can provide legitimacy to assessments. Transparency institutionalizes peer pressure as a tool of compliance. Normative surveillance strengthens adherence to rules while promoting trust among states.

Conclusion:

The **Venezuelan episode highlights the fragility of multilateralism when powerful states act unilaterally**. Upholding sovereignty, legal clarity, and collective accountability is essential to prevent a lawless global order. Strengthened institutions, transparency, and enforceable norms can restore credibility to international frameworks. India's commitment to multilateral principles exemplifies the need for principled diplomacy in a turbulent world. ***"Justice and rules are the true anchors of peace; without them, power alone rules, and no one is safe."***

Future-Proofing India'S Energy Security

This editorial is based on "From energy scarcity to abundance" which was published in The Financial Express on 02/01/2026. This article highlights how the world is transitioning towards an era of energy surplus fueled by technological innovation, presenting India with a key opportunity to reduce its reliance on imported oil.

India's energy security is a critical determinant of its economic stability, strategic autonomy, and developmental trajectory. As the **world's third-largest energy consumer**, India meets nearly **85% of its crude oil, over 50% of its natural gas**, and around **25% of its coal** requirements through imports, exposing the economy to global price volatility and geopolitical shocks. With energy demand projected to **double by 2040**, driven by urbanisation, industrialisation, and rising incomes, the challenge is to ensure energy availability that is **affordable, reliable, and sustainable**. Simultaneously, India has committed to achieving **500 GW of non-fossil fuel capacity by 2030** and **net-zero emissions by 2070**, underscoring that energy security today is inseparable from clean energy transition, diversification of supply sources, and technological self-reliance.

What is the Current Status of India's Energy Mix?

- **Energy Demand:** India is currently the **third-largest energy consumer globally**, accounting for about **6–7% of global primary energy demand**. Rapid urbanisation, industrial expansion, rising incomes, and electrification of transport and households are driving demand upward.
  - **India's total energy demand is expected to nearly double by 2040**, making energy availability a core development issue.
- **Primary Energy Mix:** India's total primary energy consumption comprises various fuel sources, reflecting **both traditional and modern energy demand across sectors (industry, transport, residential, commercial).** According to recent International Energy Agency estimates:
  - Coal: ~46% of total energy supply, 2023
  - Oil (Petroleum & other liquids): ~25% of total energy supply, 2023
  - Natural Gas: ~5% of total energy supply, 2023
  - Renewables: 22% share of power generation, 2022

What are the Key Developments in India's Energy Sector?

- **Achievement of Near-Universal Electricity Access:** One of the most transformative achievements of India's energy sector has been the near-universalisation of electricity access.
  - As per recent data from the Ministry of Power**, all villages and households are now electrified, marking a historic milestone in rural development.**
    - This has led to rise in India's **per capita electricity consumption** (18,410 MJ/ person in FY 2023–24).This reflects improved access and living standards, and despite remaining below the global average, signals steady progress toward energy equity.
  - Rural electrification has **enabled irrigation, cold storage, digital connectivity, education, and healthcare services, directly improving productivity and quality of life.**
- **Acceleration in Clean Energy Transition:** India recorded its highest-ever renewable capacity addition of **44.5 GW till November 2025**, almost doubling last year's additions. As a result, **non-fossil sources now account for over 51% of installed power capacity**, enabling India to achieve its Paris Agreement targets ahead of schedule.
  - Key initiatives driving India's clean energy transition include PM-KUSUM**,** Green Energy Corridor, PLI Schemes for Solar PV and PM E-DRIVE Scheme**.**
    - Also, the **Sustainable Alternative Towards Affordable Transportation (SATAT)** initiative is turning agricultural waste into a strategic energy asset, tackling air pollution while reducing LNG imports.
- **Substantial Progress in Energy Storage**: Recognizing that intermittency is the primary barrier to a green grid, India has pivoted from mere power generation to massive energy storage execution.
  - This "inflection point" ensures that renewable energy can provide firm, dispatchable power for industrial and peak-hour demands.
  - For instance, **India's battery energy storage capacity is set to rise nearly ten-fold** to around **5 GWh in 2026** from 507 MWh in 2025.

- **Improved Grid Strength and System Reliability**: The "One Nation, One Grid, One Frequency" framework has evolved into a high-capacity highway for green energy, drastically reducing regional power deficits and price volatility.
  - **Green Energy Corridors** and **digital grid management systems** have improved system flexibility and reduced outages.
  - The ability of renewables to **meet over half of daily electricity demand** on certain peak days demonstrates growing system maturity.
    - The **Central Electricity Authority (CEA)** estimates that regional interconnections **could grow by 50 per cent by 2030**, enabling India to export surplus renewable power.
- **Growth of Decentralised and Distributed Energy Systems:** Decentralised energy solutions have expanded rapidly, particularly in rural and agricultural areas.
  - **Rooftop solar, solar pumps, and microgrids** are reducing transmission losses and empowering communities with local energy generation.
    - For instance, Under the PM Surya Ghar: Muft Bijli Yojana, rooftop solar installations have covered **26,76,432 households**, creating a cumulative installed capacity of **7,879.07 MW**.
  - These systems enhance **energy resilience**, support farm incomes, and promote sustainable rural livelihoods
- **Advancement Towards Biofuels and Ethanol Parity:** India is aggressively pursuing fuel autonomy by converting its **agricultural surplus into high-octane fuels**, effectively turning the farm sector into an energy hub.
  - The acceleration of the **20%** ethanol blending **target** (E20) is a dual-purpose strategy for forex conservation and rural wealth creation.
  - For instance, **more than 1,000 crore litres of ethanol** have been blended during the **Ethanol Supply Year (ESY) 2024–25**, while **blending touched 19.97%** in October 2025.
- **Nuclear Renaissance and SMR Adoption:** Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India (SHANTI) Act, 2025 marks a historic opening of the nuclear sector to private investment.
  - By focusing on **Small Modular Reactors** (SMRs), India aims to provide reliable, carbon-free base-load power for hard-to-abate heavy industries.
  - The Union Budget 2025-26 **allocated ₹20,000 crore** for the Nuclear Energy Mission, **targeting 100 GW by 2047.**
- **Green Hydrogen Push:** India is leveraging its ultra-low renewable energy costs to become a competitive global exporter of green molecules, targeting the total decarbonization of fertilizer and steel.
  - The National Green Hydrogen Mission is **moving from a policy framework to physical commissioning** of dedicated coastal **"Hydrogen Hubs."**
    - **Three major ports- Deendayal Port Authority (Gujarat)**, **V.O. Chidambaranar Port Authority (Tamil Nadu)**, and **Paradip Port Authority (Odisha)**, were recognized as Green Hydrogen Hubs in October 2025.

What are the Key Issues Associated with India's Energy Sector?

- **Continued Dependence on Fossil Fuels:** Despite renewable growth, oil still accounts for around **27% of primary energy consumption**, and India imports about **85% of its crude oil needs**.
  - This exposes the Indian economy to **global price volatility** and external shocks, impacting inflation, trade balance, and fiscal stability. Despite strides in diversifying energy sources, India's reliance on imports remains deeply entrenched.
  - Also, coal **remains India's largest single source, with an installed capacity of 219 GW.**
    - This **dual dependence**, on imported fuels and domestic coal, highlights the challenges of ensuring energy security, managing environmental impacts, and accelerating the transition toward cleaner and more sustainable energy sources.

- **Renewable Generation vs. Capacity Utilisation Gap:** Though non-fossil fuel capacity has exceeded **50% of total installed power capacity,** actual renewable electricity generation is lower due to intermittency and storage limitations.
  - Renewables currently contribute about **20–25% of total electricity generation (~22% of electricity in 2024-25)**, highlighting a gap between installed capacity and reliable power output .
  - **Seasonal variability**, **limited energy storage**, and **grid balancing challenges continue to constrain utilisation.**
- **Grid Integration and Infrastructure Limitations:** The rapid addition of renewable capacity places stress on **transmission and distribution infrastructure**.
  - Integration of variable solar and wind resources requires enhanced grid flexibility, better forecasting, and expanded transmission networks across states.
    - For instance, more than **50 GW of installed renewable capacity remains under-utilised due to transmission bottlenecks**, where generation assets are technically ready but power cannot be evacuated efficiently because **transmission lines, substations, and evacuation corridors have not expanded in step with capacity additions.**
  - While investments in Green Energy Corridors and **smart grid technologies** are underway, **delays in implementation and inter-state coordination issues can hinder smooth renewable integration**.
- **Land Acquisition and Right-of-Way (RoW) Conflicts:** Securing large, contiguous parcels of land for **"Giga-scale"** solar parks is increasingly sparking community opposition and legal battles over fertile agricultural soil and grazing rights.
  - These **"green-on-green"** conflicts are delaying project commissioning and forcing developers into expensive litigation that erodes the low-tariff advantage of renewable energy.
  - For instance, In June 2025, thousands of **farmers staged protests** against the government's plan to acquire 8,300 acres of fertile land for a solar project near **Ramayapatnam Port in Andhra Pradesh**.
- **Financial Stress in Electricity Distribution Companies:** Many **state distribution companies (DISCOMs)** continue to face financial stress due to **high Aggregate Technical & Commercial (AT&C) losses**, cross-subsidies, and delayed payments to generators.
  - The aggregate technical and commercial (AT&C) losses of Discoms widened to **17.6% in FY24 from 15.4% in FY23**.
  - This affects their **ability to invest in infrastructure, procure power efficiently**, and implement reforms.
  - Although recent policies promote tariff rationalisation and smart metering, **DISCOM viability remains a core challenge to sectoral efficiency.**
- **Underdeveloped Natural Gas Market:** Natural gas currently accounts for only **6.8 % of primary energy consumption**, well below the government's target of **15% by 2030**.
  - Infrastructure constraints, limited pipeline networks, and historically high LNG prices have slowed growth in gas demand.
  - A robust natural gas ecosystem is important for **cleaner industrial processes, power generation**, and reduced carbon intensity, **but progress has been slower than anticipated**.
- **Environmental and Climate Pressures:** India's energy sector is a **major contributor to air pollution and carbon emissions.**
  - Although India's power sector CO_2 emissions **fell by 1% year-on-year** in the **first half of 2025,** the sector continues to be a major contributor to air pollution and carbon emissions.
  - **Balancing economic development** with **environmental objectives** continues to **be a complex policy challenge.**
  - Also, the **persistent delay** in installing Flue Gas Desulphurization (FGD) technology across coal-

fired plants continues to jeopardize national air quality and public health.

- **Supply Chain Vulnerability and Critical Mineral Risks:** India's heavy reliance on imported critical minerals for EV batteries and high-efficiency solar cells exposes the energy transition to severe geopolitical shocks and **"resource nationalism."**
  - The recent 2025 export restrictions on rare-earth magnets by major global suppliers (like China) have already forced Indian automakers to slash production targets, highlighting a single point of failure.
    - For instance, In mid-2025, **Maruti Suzuki had cut near-term production** targets for its maiden electric vehicle e-Vitara by two-thirds because of rare earths shortages.

What Measures can India Adopt to Strengthen its Energy Security?

- **Diversifying the Energy Mix to Reduce External Vulnerabilities:** A key pillar of energy security is diversification. Currently, India imports nearly **85% of its crude oil** and over **50% of its natural gas**, making it vulnerable to geopolitical tensions and global price shocks.
  - Expanding the share of **renewable energy, nuclear power, and domestic coal with cleaner technologies** can reduce dependence on imported fuels.
  - India's achievement of **over 50% non-fossil fuel capacity** demonstrates that diversification is already underway and must be accelerated .
- **Strengthening Grid Infrastructure and Energy Storage:** Energy security is not only about generation but also about delivery. Investments in **inter-state transmission networks, Green Energy Corridors, and smart grids** improve system flexibility and resilience.
  - Energy storage through **pumped hydro, battery storage, and emerging technologies** is essential to manage renewable intermittency and meet peak demand.
- **Enhancing Domestic Energy Production and Strategic Reserves:** Boosting domestic production of coal, oil, and gas remains important for near- and medium-term security.
  - At the same time, expanding **Strategic Petroleum Reserves (SPRs)** helps buffer short-term supply disruptions.
  - India's existing SPR capacity, covering several days of imports, is being expanded (eg, **Padur in Karnataka and Chandikhol in Odisha**) to improve resilience against global supply shocks, which is a significant step in the right direction.
- **Improving Energy Efficiency and Demand-Side Management:** Energy security can be strengthened **not only by increasing supply but also by reducing waste.** India's energy intensity has declined significantly over the last decade due to efficiency measures.
  - Programs promoting **LED lighting, efficient appliances, industrial energy audits, and time-of-day pricing** help moderate demand growth.
  - Lower energy intensity reduces import dependence and infrastructure stress while supporting sustainable growth
- **Electrification of Transport and Promotion of Alternative Fuels:** Transport remains India's largest oil-consuming sector. Accelerating **electric mobility**, supported by renewable-powered charging infrastructure, can substantially reduce oil imports.
  - In parallel, **biofuels, ethanol blending, compressed biogas, and green hydrogen** can diversify fuel options for transport and industry.
  - India's **ethanol blending programme** has already crossed **20% blending**, reducing crude oil imports and enhancing fuel security.
- **Strengthening Distribution Sector and Market Reforms:** Financially viable and efficient **DISCOMs** are essential for energy security. Ongoing reforms such as **smart metering, tariff rationalisation, reduction in AT&C losses, and market-based electricity trading** improve reliability and attract investment.
  - A robust distribution sector ensures that **energy generated is efficiently delivered to consumers without systemic stress.**

- **Building Domestic Manufacturing and Technological Self-Reliance:** Energy security is closely linked to technological self-reliance.
  - Expanding domestic manufacturing of **solar modules, batteries, electrolysers, and power equipment under Production Linked Incentive (PLI) schemes** reduces dependence on imports and strengthens supply chains.
  - This also **creates jobs** and positions India as a **global clean energy hub.**
- **Integrating Energy Security with Climate and Strategic Goals:** India's long-term energy security aligns with its commitments of **net-zero emissions by 2070**. Clean energy expansion, electrification, and efficiency improvements ensure that rising energy demand does not undermine environmental stability.
  - **Energy diplomacy**, **diversified import sources,** and **regional power cooperation** further strengthen India's strategic position

Conclusion:

India's energy transition strongly advances **SDG 7 (Affordable and Clean Energy)** by achieving universal electrification and rapidly expanding **non-fossil power capacity beyond 50%**. By **reducing import dependence, improving grid reliability, and promoting efficiency** and clean technologies, energy is becoming a driver of inclusive growth rather than a constraint. The coming decade will determine how effectively **India converts this momentum into long-term security, affordability, and sustainability.**

India–Bangladesh Ties Under Strategic Recalibration

This editorial is based on "Undermining India, Bangladesh relations" which was published in The Hindustan on 04/01/2026. The article highlights recent strain in India-Bangladesh Relations and how cooperation in water, trade, connectivity, security, and people-to-people exchanges can drive regional stability and shared growth.

India and Bangladesh share **deep historical, cultural, and strategic ties rooted in the 1971 Liberation War,** with sustained cooperation in trade, connectivity, and security. In recent years, Bangladesh has emerged as one of **India's largest trade partners in South Asia**, reflecting expanding economic engagement. However, **recent targeted violence against minorities and law-and-order challenges in Bangladesh** have **drawn public and diplomatic attention,** influencing perceptions and people-to-people exchanges. Symbolic disagreements have also emerged in **sports diplomacy**, such as the January 2026 BCCI directive for an IPL team to release pacer from Bangladesh and Dhaka's request to the ICC to relocate Bangladesh's T20 World Cup matches from India.

How India-Bangladesh Relations have Evolved Over Time?

- **The Foundation and "Mujib-Indira" Era (1971–1975):** The relationship began with India's decisive military and diplomatic support during the **1971 Liberation War**, cementing a bond based on shared secular values.
  - This period saw the signing of the landmark **1972 Treaty of Friendship** and the **1974 Land Boundary Agreement (LBA)**, establishing the initial legal framework for the new state.
  - Moreover, India hosted nearly **10 million refugees**, underscoring early people-centric cooperation and a strong civilizational bond with **India**.
- **Strategic Divergence and Military Rule (1975–1996):** Following the assassination of Sheikh Mujibur

Rahman in 1975, military-led regimes shifted Bangladesh's foreign policy closer ties with China/ Pakistan to counterbalance India.

- This era was marked by the rise of anti-India rhetoric, disputes over the **Farakka Barrage**, and India's concerns regarding insurgent groups from the Northeast operating out of Bangladeshi soil.

- **Democratic Transition and "Golden Era" (1996–2024):** The return of the Awami League, first in 1996 and then consistently from 2009 to 2024, saw the relationship rebranded as a **"Shonali Adhyay" (Golden Chapter)**.
  - Landmark achievements included the finalization of the **2015 Land Boundary Agreement** (exchange of 162 enclaves) and the 2014 Maritime Boundary settlement via international arbitration, removing decades-old territorial irritants.
- **Recent Transition and the 2026 Reset (2024–Present):** The ouster of **Sheikh Hasina** in August 2024 and the rise of an interim government led by **Muhammad Yunus** have introduced a phase of **"pragmatic recalibration."**
  - It has led to a significant surge in communal instability. India has repeatedly raised alarms over the **"recurring pattern"** of targeted violence against Hindus, viewing their safety as a non-negotiable metric.
  - This friction has turned minority rights into a central diplomatic pivot, with New Delhi demanding swift legal action while Dhaka often attributes the unrest to **"political vendettas" or "propaganda" rather than religious persecution.**

What are the Key Areas of Convergence Between India and Bangladesh?

- **Economic & Trade Deepening**: Bilateral trade and development finance remain a central pillar. India–Bangladesh trade has been substantial and continues to be prioritized by both the countries.
  - In FY 2023-24, the **total bilateral trade is reported to be USD 14.01 billion** with India exporting USD 12.05 billion and Bangladesh exporting USD 1.97 billion of goods.
  - Further, India has extended multiple LoCs to Bangladesh amounting over **USD 7-8 billion** in recent years to **support roads, railways, ports and other infrastructure**, a major instrument of India's development partnership.
- **Connectivity & Transport**: India's effort to strengthen physical connectivity with Bangladesh is clearly visible on the ground, with several projects moving beyond MoUs to construction and operation.
  - Cross-border rail links such as Agartala–Akhaura, the use of **Chittagong and Mongla ports** for Indian cargo, revival of old rail routes like **Haldibari–Chilahati** and **Petrapole–Benapole**, expanded **inland waterways trade under the Protocol on Inland Water Transit and Trade**, and the Maitri Setu **over the Feni River** (connecting Sabroom in India's Tripura state with Ramgarh in Bangladesh) have together improved connectivity.
- **Energy & Resource Cooperation: Energy cooperation** has emerged as one of the most successful pillars of India–Bangladesh relations, marked by practical interdependence and operational depth.
  - The India–Bangladesh Friendship Pipeline (enables direct supply of diesel and petroleum products, reducing transport costs and ensuring fuel security for northern Bangladesh.
    - Bangladesh has committed to importing 180,000 tonnes of diesel from India's state-owned Numaligarh Refinery Limited (NRL).
  - **Cross-border electricity trade** has expanded steadily, with India exporting power through multiple grid interconnections and facilitating **sub-regional power flows**, including the recent **trilateral arrangement where Nepal supplies hydropower to Bangladesh via Indian transmission networks**.
    - Long-term cooperation is further reflected in projects such as the **Maitree Super Thermal Power Plant**, developed with Indian assistance, and enhanced grid links between eastern India and Bangladesh.

- **People-to-People, Culture & Education: Cultural diplomacy and people-to-people initiatives** give depth to India–Bangladesh relations beyond official engagements.
  - Programmes such as the **Indian Council for Cultural Relations (ICCR)** scholarships for Bangladeshi students sustain everyday goodwill.
  - Exchange programmes between **Visva-Bharati University and Bangladeshi institutions,** and cross-border travel under liberalised visa regimes (when operational) reinforce shared linguistic and cultural heritage.
    - Further, the **Indira Gandhi Cultural Centre (IGCC) in Dhaka** serves as a vital bridge for people-to-people ties by **promoting Indian art, culture, language,** and shared heritage through exhibitions, festivals, and educational programmes.
  - **Medical tourism** has become a key driver of **people-to-people ties** between India and Bangladesh, with thousands of Bangladeshi patients seeking affordable, high-quality treatment in Indian cities each year.
- **Security & Defence Cooperation:** Security cooperation between India and Bangladesh has evolved into a **quiet but effective success story**, based on trust and shared interests rather than formal alliances.
  - Bangladesh's historic action against **anti-India insurgent groups** has greatly improved security and stability in India's Northeast, **aiding development in states like Tripura, Assam, and Mizoram.**
  - At the operational level, coordinated border management between the **Border Security Force** and **Border Guard Bangladesh**, supported by regular DG-level talks, has reduced smuggling, trafficking, and border frictions.
  - Defence cooperation has widened through **Lines of Credit, training, and equipment support**, while joint exercises such as **Exercise Sampriti** strengthen interoperability, disaster-response capacity, and mutual confidence.
- **Political & Diplomatic Engagement**: India and Bangladesh continue active high-level diplomacy focused on partnership rather than episodic friction.
  - The unveiling of the **"Maitri Satellite"** cooperation and a **shared vision for Green/ Digital/Blue economy partnerships** shows diplomacy being used to seed sectoral cooperation (space, climate, digital).
    - However, recent political and strategic frictions have placed this engagement under strain, underscoring the need for timely recalibration to preserve trust and sustain momentum in the partnership.

What are the Areas of Friction in India-Bangladesh Relations?

- **Unresolved River Water-Sharing Disputes:** Water sharing remains the **most enduring structural irritant** in India–Bangladesh relations.
  - Despite functional cooperation under the **Joint Rivers Commission** covering over 50 shared rivers, the **Teesta river water-sharing agreement** remains unresolved.
    - The delay deepens perceptions in Bangladesh of **asymmetric benefit-sharing**, particularly during the lean season when northern districts face acute irrigation stress, crop losses, and livelihood vulnerability.
  - The expiration of the **1996 Ganga Water Sharing Treaty in December 2026** has **turned resource management into a ticking time bomb** amidst a climate of low diplomatic trust.
- **Political Sensitivities:** Bilateral relations are periodically **filtered through domestic political narratives**, particularly during election cycles in both countries.
  - In Bangladesh, opposition forces at times frame India as an **overbearing or asymmetrical partner**, using sovereignty and water-sharing issues to mobilise public opinion.
  - In India, especially in **border states**, electoral politics can harden stances on migration, border management, and river-water sharing, limiting diplomatic flexibility at the Union level.

- Also, the presence of former **PM Sheikh Hasina in India** has become a profound diplomatic irritant, with **Dhaka's interim government viewing her "hospitality" as a barrier to domestic justice.**
- **Border Management Challenges:** Although cooperation has improved markedly, the **over 4,000 km-long India–Bangladesh border** remains complex and porous, continuing to face challenges such as **smuggling, human trafficking, cattle trade disputes, and sporadic use-of-force incidents**.
  - These issues are **driven by socio-economic asymmetries**, **dense cross-border habitation**, riverine and unfenced stretches, and the presence of informal border economies.
  - Domestic debates in India over the **National Register of Citizens (NRC) and the Citizenship Amendment Act (CAA),** particularly during the **Assam NRC exercise**, have generated anxieties about possible displacement of undocumented or irregular migrants.
    - **Also, recent riots in Bangladesh** have compelled India to recalibrate border vigilance and refugee-related responses to balance humanitarian concerns with internal security and social stability.
- **The "China-Pakistan" Pivot and Strategic Encirclement:** India faces a **"strategic vacuum"** as the interim government recalibrates its foreign policy toward a "multi-aligned" approach that **visibly favors Beijing and Islamabad**.
  - The potential for **Chinese-led infrastructure projects** near the **Siliguri Corridor ("Chicken's Neck")** and renewed defense talks with Pakistan are viewed by New Delhi as existential threats to its regional hegemony.
  - Recently, **Bangladesh secured $2.1 billion in new Chinese investments**, and reports emerged of talks regarding the **purchase of JF-17 Thunder fighter jets from Pakistan,** signaling a **sharp departure from Indian defense dependency**.
- **Trade Imbalance & Non-Tariff Barriers:** Despite rising bilateral trade, Bangladesh continues to face a **large trade deficit with India**, sharpening concerns over equitable market access.
  - Bangladeshi exporters frequently point to **non-tariff barriers** such as stringent **BIS standards on food and plastic goods**, delays due to limited **testing and certification facilities at land ports**.
  - In April 2025, **Bangladesh restricted Indian yarn** and **rice exports** via land ports, prompting India to retaliate by banning ready-made garments (RMGs) from Bangladesh through its land ports.
- **Delays in Project Implementation:** Although India's **Lines of Credit (LoCs)** and infrastructure assistance to Bangladesh are extensive, several projects have faced delays due to **land acquisition challenges, inter-agency coordination gaps, and procedural bottlenecks** on both sides.
  - For example, **Khulna–Mongla Port railway line** has faced delays due to tendering, land acquisition, and approval clearances.
- **Soft Power Breakdown:** The recent humanitarian crisis in Bangladesh, marked by rising incidents of communal violence, **including at least 51 reported cases in December 2025, has contributed to a soft power breakdown.**
  - People-to-people goodwill has weakened d**ue to rising political mistrust, sporadic violence, and negative domestic narratives in Bangladesh,** diluting the cultural, educational, and historical bonds that once underpinned the bilateral relationship.
  - It has also **impacted Cricket Diplomacy**. The **BCCI instructed an IPL Team to release pacer from Bangladesh, citing "external developments,"** following which the Bangladesh Cricket Board formally approached the ICC seeking relocation of Bangladesh's **T20 World Cup matches from India to Sri Lanka**, citing security concerns.

What Measures are Needed to Strengthen India-Bangladesh Relations?

- **Calibrated Diplomatic Rebalancing:** India should pursue a carefully calibrated diplomatic rebalancing by conveying firm yet discreet signals to Bangladesh to address the ongoing humanitarian and human rights concerns, **particularly communal violence, while leveraging dialogue, development cooperation, and people-to-people engagement** to **gently project normative influence without appearing interventionist.**

  - India must clearly and consistently **counter misinformation** and **anti-India propaganda in Bangladesh** through proactive diplomatic communication, strategic media engagement, while avoiding escalation and reinforcing its image as a reliable and respectful partner.

- **Resolving River Water Sharing through Cooperative Federalism:** Water cooperation must move from episodic negotiation to **institutionalised basin-level management**. Early resolution of the **Teesta water-sharing agreement** through consensus-building with Indian states, especially West Bengal, would significantly strengthen trust.
  - Joint hydrological data sharing, real-time flood forecasting, and river rejuvenation projects can convert water from a source of contestation into cooperation.
- **Deepening Economic Integration Beyond Trade Volumes:** Bilateral economic engagement should evolve from trade expansion to **value-chain integration**.
  - Reducing non-tariff barriers, harmonising standards, and upgrading land ports into **Integrated Check Posts (ICPs)** will ease cross-border commerce.
  - Promoting joint ventures in pharmaceuticals, and agro-processing can help Bangladesh move up the value chain while benefiting Indian manufacturers.
- **Accelerating Connectivity & Project Delivery:** Connectivity projects must prioritise **time-bound execution and outcome monitoring**. Strengthening coordination between executing agencies, faster dispute resolution, and capacity support for project management in Bangladesh will enhance credibility.
  - **Inland waterways, coastal shipping, and multimodal logistics** should be scaled to integrate India's Northeast with Bangladesh and beyond.
- **Institutionalising Security & Defence Cooperation:** Security cooperation should deepen through **intelligence-sharing protocols, coordinated border patrolling, and capacity-building of law enforcement agencies**.
  - Joint exercises should expand to maritime security, cyber threats, and disaster response. A **stronger HADR framework** will address common climate and disaster vulnerabilities.
- **Managing Migration & Border Issues Humanely:** Border management must balance security with humanitarian concerns. Use of **technology-based surveillance**, non-lethal border management practices, and improved coordination between **BSF and BGB** can reduce civilian casualties.
  - Regular border community interactions can ease tensions and build trust.
- **Expanding Energy & Green Cooperation:** The future trajectory of India–Bangladesh relations is closely tied to **deepening energy interdependence**. Expanding cross-border **electricity trade**, regional power pooling, and reliable **gas supply linkages** can enhance energy security for both sides.
  - Joint cooperation in **renewable energy**, including solar parks, grid-scale storage, and emerging areas such as **green hydrogen and offshore wind in the Bay of Bengal**, can align bilateral growth with climate commitments. Such partnerships would not only lower carbon intensity but also position the two countries as key contributors to a **regional clean-energy transition in South Asia**.
- **Enhancing People-to-People & Cultural Exchanges:** Deepening people-to-people ties requires **simpler and more predictable visa regimes**, especially for students, patients, and business travellers.
  - Cooperation in **medical tourism** and **healthcare services** directly benefits citizens while generating goodwill and service-sector growth. Together with collaboration in **skill development and youth exchanges**, these initiatives create durable social constituencies that anchor the bilateral relationship beyond politics.

Conclusion:

India–Bangladesh relations should be strengthened by transforming historical goodwill into **institutionalised, people-centric cooperation**. Addressing issues through dialogue, cooperative federalism, and timely project delivery will deepen trust and credibility. Expanding collaboration in connectivity, energy, security, and climate action can create shared prosperity and regional stability. Ultimately, a mature partnership anchored in **mutual sensitivity, strategic autonomy, and societal linkages** will define the future trajectory of bilateral ties.

Bridging the Gap Between Growth and Employment in India

This editorial is based on "Growth need not generate jobs" which was published in The Hindu business line on 08/01/2026. The article highlights how growth always does not automatically lead to employment generation. It shows how productivity-led growth, automation, formalisation, and services-sector dominance have weakened the traditional growth–jobs linkage.

India has continued to register robust economic expansion, with its GDP projected to grow at around **7.4% in FY 2025-26**, reflecting strong domestic demand and investment momentum. However, the **labour market response has been uneven**, as official data from the **Periodic Labour Force Survey (PLFS) 2023-24** shows only a modest decline in the overall unemployment rate to **about 3.2%**, with significant variations between rural and urban areas. While **labour force participation and worker population ratios have improved**, many workers remain in informal or low-quality employment. This divergence between strong GDP growth and relatively subdued job creation highlights concerns about **jobless growth**, where economic output rises faster than employment opportunities.

What is the Current Growth Performance of Various Sectors of the Indian Economy?

- Primary Sector
  - **Agriculture and Allied Activities**: The agriculture sector in India has shown robust growth, averaging 5% annually from FY17 to FY23. Strong performance in **livestock, dairy, fisheries, and horticulture** has offset climate-related risks in crop production.
    - Government focus on irrigation, agri-infrastructure, digital agriculture, and value chains is expected to enhance **future productivity, diversification, and farm incomes**.
  - **Mining and Quarrying:** Mining and quarrying support India's industrial and infrastructure expansion by supplying **key raw materials such as coal, iron ore, limestone, and critical minerals.**
    - Recent improvements in output reflect rising demand from construction, power, and manufacturing sectors. Policy reforms in mineral auctions, exploration, and critical mineral strategy position mining as a **strategic enabler of long-term growth and energy transition**.
    - For instance, **India is the 2nd largest Aluminium producer,** among top-10 producers **in refined copper** and **4th largest iron ore producer in the world.**
- Secondary Sector:
  - **Manufacturing Sector**: Manufacturing has emerged as a **key growth pillar**, recording **strong growth of around 9.9% in recent quarters**, according to PIB data.
    - The sector spans **labour-intensive industries** (textiles, garments, food processing), **capital-intensive industries** (cement, steel, automobiles), and **technology-driven sectors** (electronics, pharmaceuticals, engineering goods).
- For instance, **MSMEs contribute 30% to India's GDP and over 45% to exports.** They are the second-largest employer in India after agriculture.
  - Initiatives such as **PLI schemes, Make in India, and supply-chain diversification** are strengthening India's manufacturing competitiveness and export potential.

- For instance, **the PLI scheme** has **attracted investments of over ₹1.76 lakh crore**, driving growth in output, exports, and jobs.
- **Construction and Infrastructure**: Construction continues to be a **major growth and employment generator**, driven by record public capital expenditure on **roads, railways, ports, housing, and urban infrastructure**.
  - The sector is estimated to grow by **9.4% in FY 2024–25**, reflecting strong infrastructure momentum and significant multiplier effects across cement, steel, transport, and related services.
  - This sector is crucial for crowding in private investment and regional development.
- **Electricity, Gas, Water Supply and Renewables:** The electricity, gas, water supply and other utility services sector, contributing about **2.1% to GVA**, recorded **moderate but steady growth at constant prices in FY 2025–26**.
  - This expansion has been driven by rising energy demand from households, industry, and services, alongside continued investments in grid modernisation and transmission infrastructure.
  - Rapid capacity addition in **solar, wind, and other renewable energy sources** has strengthened energy security, reduced dependence on fossil fuels, and supported India's climate commitments.

Tertiary Sector:

- **Trade, Transport, Tourism and Communication Services:** Trade, hotels, transport, communication and services related to broadcasting are estimated to grow by **7.5% at constant prices in FY 2025–26**, reflecting the strong revival of consumption-led services.
  - This growth has been supported by a **7.0% rise in real Private Final Consumption Expenditure (PFCE),** expansion of logistics and warehousing, improved transport infrastructure, and higher digital connectivity.
- **Financial, Real Estate and Professional Services:** Financial, real estate and professional services are estimated to record a robust **9.9% growth at constant prices in FY 2025–26**, emerging as one of the strongest drivers of tertiary sector expansion.
  - This performance has been u**nderpinned by sustained credit growth, increasing formalisation of the economy, fintech-led financial inclusion,** and rising housing and commercial real estate demand.
  - Alongside a **7.8% growth in Gross Fixed Capital Formation (GFCF)** , these services play a crucial role in mobilising capital, facilitating investment, and improving productivity across agriculture, manufacturing, and services, thereby reinforcing overall GDP growth.
- **IT, Digital Services, R&D and Knowledge Economy:** India's IT, digital services, R&D and knowledge-intensive activities continue to strengthen the services sector, contributing significantly to the **buoyant services-led Real GVA growth of 7.3% in FY 2025–26**.
  - Expansion in software and IT-enabled service exports, rapid adoption of digital public infrastructure, growth of startups, and rising research-oriented services have enhanced high-value output and skilled employment.

What is the Current Status of Employment in India?

Key Macro Indicators

- **Unemployment Rate (UR)**: Currently at **4.7% (as of late 2025)**, marking a significant recovery.
- **Labor Force Participation Rate (LFPR)**: Standing at **approximately 55.8%,** showing a steady increase as more people enter the active job market.
- **Youth Employment (15-29 years):** Hiring for youth is projected to rise **by 11% in 2026**, though a "skill gap" remains a hurdle.

- **Sectoral Shifts & Highlights**
  - **Manufacturing Surge:** Driven by **PLI schemes and "Industry 4.0,"** this sector is demanding high-skill roles like IoT engineers, automation specialists, and semiconductor technicians.
  - **Gig Economy Explosion:** The gig workforce is expected to **add 20 lakh (2 million) jobs in 2026 alone,** fueled by the expansion of quick-commerce and delivery services into Tier-2 and Tier-3 cities.
  - **Service Sector Dominance:** Professional services, Finance, and Insurance lead the hiring outlook for Q1 2026, with India reporting the **2nd strongest hiring outlook globally (Net Employment Outlook of 52%).**
- **Qualitative Trends**
  - **Formalization:** Record additions to **EPFO (Provident Fund), often exceeding 20 lakh net subscribers in peak months,** indicate a move from informal "cash" jobs to organized, social-security-backed employment.
  - **Women in the Workforce:** Female LFPR has risen to **roughly 35%–41% (depending on the survey criteria)**, supported by flexible work models and government initiatives like the Stand Up India scheme.
  - **The AI Impact:** While automation is reducing some entry-level manual roles, it is creating a massive **"upskilling"** demand for AI-ready talent in IT and Fintech.
- **Despite these resilient growth** prospects and a high GDP growth rate in India, the economic momentum **has not yet resulted in enough high-quality employment generatio**n to fully absorb the youth entering the workforce annually, leading to persistent competition for formal roles.

Why has India's Growth Trajectory Not Translated Into Adequate Employment Generation?

- **Structural Shift Towards Capital Intensity:** Growth is increasingly driven by **"machines over men"** as manufacturing and infrastructure projects adopt high-end automation to remain globally competitive.
  - India has skipped the **traditional "manufacturing-first" development phase, moving straight to a services-led econom**y which is inherently less labor-absorptive for unskilled workers.
  - Even with continued services-sector expansion (Services PMI, Dec 2025), **hiring remained subdued due to cost pressures and efficiency-led strategies**.
    - Services employment is concentrated in low-end, informal segments and business surveys show expansion without commensurate hiring due to cost and productivity pressures.
    - Consequently, **services-led growth sustains macro momentum but has limited capacity to create mass, stable jobs** for moderately skilled workers.
- **Informalisation and Poor Job Quality:** India's labour market stress is obscured by moderate headline unemployment, even as job quality remains weak.
  - **The** ILO–IHD India Employment Report 2024 notes that **about 82% of the workforce is in the informal sector and nearly 90% is informally employed,** lacking contracts, social security, and protection.
  - Much of employment growth is in **necessity-driven self-employment and casual work**, such as petty trade and gig activities, marked by low wages, income insecurity, and limited mobility, **weakening the link between growth and inclusive development.**
- **Skill Mismatch and Paradox of Learning Without Livelihoods:** Rising educational attainment has not been matched by sufficient creation of formal, skill-appropriate jobs, resulting in graduate underemployment and youth frustration.
  - The ILO–IHD India Employment Report 2024 shows that **educated youth (secondary level and above) among the unemployed increased from 35.2% in 2000 to 65.7% in 2022**.
    - According to the India Skills Report 2025 **, while employability is rising, still only 54.8% of Indian graduates** are considered "job-ready" for their respective industries.

- **Regional Divergence and Weak Urban Job Engines:** PLFS (Periodic Labour Force Survey) data on usual status employment and regular wage/salaried jobs show a clear spatial concentration: states such as **Maharashtra, Tamil Nadu, Gujarat, Karnataka, and Uttar Pradesh** together account for a disproportionately high share of **regular formal employment**, while eastern and central states record much higher **self-employment and casual labour shares**.
  - This indicates that **metros and industrial cluster cities generate relatively more stable jobs,** whereas **smaller towns** lacking manufacturing density, **MSME formalisation**, and **urban infrastructure**, remain weak employment absorbers despite a growing workforce.
- **Regulatory Cholesterol and "Dwarfism" of Firms:** Complex compliance requirements and archaic stringent labor codes (even with recent 2025 reforms) discourage small firms from hiring enough people to cross the "threshold" into large enterprises.
  - This **"regulatory cholesterol"** forces businesses to **stay small or "dwarf,"** where they lack the scale to provide job security, training, or competitive salaries to their employees.
  - Due to this, Micro enterprises account for **over 99% of the total number of Micro, Small, and Medium Enterprises (MSMEs)** in India.
- **Premature De-skilling in the Gig Economy:** The **"Quick Commerce" and gig-platform boom is acting as a "labor sponge,"** absorbing millions of youth, but it offers "dead-end" jobs with zero skill progression or social security.
  - This creates a workforce that is **"employed" but "under-productive,"** trapped in roles that will eventually be replaced by drone delivery or AI-driven logistics, leading to future joblessness.
  - According to government estimates, **the number of gig and platform workers could rise to about 23.5 million by 2029-30.** Research shows that youth entering the gig economy after school experience **"skill atrophy,"** becoming less likely to transition into formal office roles later.

What Measures Can be Adopted to Improve Job Creation While Supporting the Growth in India ?

- **Reorient Growth Strategy Towards Employment-Intensity:** India's growth strategy must explicitly incorporate **employment as a core objective**, not merely as a by-product of GDP expansion.
  - Policymaking should prioritise **employment elasticity of growth**, encouraging sectors and technologies that generate more jobs per unit of output, especially in labour-surplus conditions.
  - Integrating **employment targets into industrial, infrastructure, and investment policies** can ensure growth remains inclusive and socially sustainable.
- **Strengthen Labour-Intensive Manufacturing:** Labour-intensive industries such as **textiles, garments, leather, footwear, food processing, toys, and light engineering** hold immense potential for large-scale job creation.
  - **Targeted incentives,** simplified compliance, cluster-based infrastructure, and export facilitation can help these sectors absorb surplus labour, particularly from agriculture.
  - **Aligning PLI-type support with employment outcomes rather than only output can further enhance job creation**.
- **MSME Expansion and Productivity Enhancement:** MSMEs are the backbone of employment generation in India.
  - Improving access to **affordable credit, technology, digital platforms, market access, and skilling support** can significantly enhance their capacity to generate jobs.
  - **Formalisation** through GST, Udyam registration, and digital payments should be **complemented with reduced compliance burden to prevent premature exit or informality-driven stagnation.**
- **Promoting Infrastructure-Led Employment:** Sustained public investment in **infrastructure,**

housing, urban development, and rural connectivity can generate large-scale direct and indirect employment.

- Construction has high employment multipliers and supports allied sectors such as **cement, steel, transport, and services.**
- Timely project execution and decentralised infrastructure planning can maximise job creation across regions.

- **Agricultural Transformation and Non-Farm Rural Jobs:** Improving productivity and incomes in agriculture through **diversification, value addition, food processing, agri-logistics, and allied activities** can create both on-farm and off-farm employment.
  - Promoting rural non-farm enterprises, agro-processing clusters, and **farmer producer organisations (FPOs)** can absorb surplus labour while raising rural incomes and resilience.
- **Services-Led Job Creation Beyond High-End Skills:** While IT and financial services drive growth, employment generation requires expansion of **labour-absorbing services** such as tourism, hospitality, healthcare, education, logistics, retail, and personal services.
  - **Investment in urban services**, medical tourism, care economy, and local service delivery can create large numbers of jobs across skill levels.
- **Skilling, Reskilling and Education–Industry Alignment:** A dynamic labour market requires continuous **skilling, reskilling, and upskilling** aligned with industry needs. Strengthening vocational education, apprenticeships, and industry-linked training programs can improve employability and productivity.
  - Special focus is **needed on digital skills, green skills, and future technologies** to ensure workforce readiness without excluding low-skilled workers.
  - Strengthen apprenticeships **under NAPS to bridge the education–employment gap.** Apprenticeships create **earn-while-you-learn pathways,** improve job readiness, and lower hiring risks for firms, especially MSMEs.
- **Labour Market Reforms with Worker Security:** Simplifying labour regulations while ensuring **worker protection, social security, and portability of benefits** can encourage firms to expand employment.
  - Effective implementation of **labour codes, universal social security** coverage for informal and gig workers, and easier hiring while safeguarding rights can reduce informality and improve job quality.
- **Promote Green and Care Economy Jobs:** The transition to a **green economy** offers significant employment potential in renewable energy, energy efficiency, waste management, electric mobility, and climate-resilient infrastructure.
  - Similarly, the **care economy** (healthcare, childcare, elderly care, and social services) **can generate dignified and gender-inclusive employment** while supporting long-term human development.
- **Encourage Formalisation and Urban Employment Ecosystems:** Urban job creation can be strengthened by supporting **manufacturing-service linkages, startup ecosystems, urban MSME clusters, and innovation hubs**.
  - Formalisation through digital platforms must be accompanied by incentives that lower the cost of compliance and encourage firms to grow rather than remain small.
- **Improve Data, Monitoring and Policy Coordination:** Robust labour market data and real-time monitoring of employment outcomes are essential for evidence-based policymaking.
  - Better coordination between ministries of finance, labour, industry, education, and skill development can ensure that growth policies are aligned with employment objectives at both national and state levels.

Conclusion:

India's jobless growth **reflects a structural shift towards productivity- and technology-led expansion,** strengthening macroeconomic stability and global competitiveness. The challenge lies not in the absence of growth, but in **aligning it more closely with employment generation. By promoting labour-intensive sectors, MSMEs, skilling and apprenticeships, and green and care economies, India can convert growth into quality jobs.** This balanced approach advances **SDG-8 (Decent Work), SDG-9 (Industry & Innovation) and SDG-10 (Reduced Inequalities) while sustaining high growth.**

Navigating India-Germany Relations

This editorial is based on "India, Germany to simplify defence trade" which was published in The Hindu on 12/01/2026. This article examines the evolving India–Germany strategic partnership, highlighting growing cooperation in defence, technology, trade and green transition. It also analyses key divergences and outlines measures to strengthen bilateral ties in a rapidly changing global order.

India–Germany relations are witnessing a strategic upswing driven by shared democratic values and expanding cooperation across economic, technological and security domains. Bilateral trade has **crossed USD 50 billion,** making **Germany India's largest trading partner in the EU**. Recent high-level engagements have yielded **MoUs in defence, clean energy, skills and innovation, alongside momentum on the India–EU FTA.** The partnership is thus evolving into a broad-based strategic collaboration beyond trade alone.

How Have India–Germany Relations Evolved Over Time?

- **Phase I: Establishment and Development Cooperation (1951–1970s):** India and Germany established diplomatic relations in **1951**.
  - In the post-war period, Germany emerged as an important **development and technical partner** for India, supporting industrial training, infrastructure and capacity building through institutions like **KfW**.
  - Engagement remained largely economic and developmental with limited political or strategic depth.
- **Phase II: Cold War Constraints (1970s–1989):** Cold War alignments **restricted strategic engagement,** as India maintained close ties with the Soviet Union while Germany remained within the **NATO bloc**.
  - Cooperation continued in economic assistance, renewable energy and technical education, but political and defence ties remained limited.
- **Phase III: Post-Cold War Reorientation (1990–1999):** German reunification and India's **1991 economic liberalisation** marked a turning point.
  - Trade, investment and technology collaboration expanded rapidly, particularly in manufacturing and engineering sectors.
    - Political engagement deepened as both adjusted to a multipolar global order.
- **Phase IV: Strategic Partnership Phase (2000–2010):** In **2000**, India and Germany formally declared a **Strategic Partnership**, institutionalising political dialogue and expanding cooperation in science, technology, education and multilateral forums.
  - The relationship **acquired long-term strategic intent** during this phase.
- **Phase V: Institutional Deepening via IGC (2011–2019):** The launch of **Inter-Governmental Consultations (IGC) in 2011** elevated ties to a high-trust partnership.
  - Cooperation expanded in **renewable energy, climate action, urban development, skilling and higher education**, with Germany emerging as a key partner in India's sustainable development agenda.
- **Phase VI: Strategic Convergence (2020–Present):** The relations have evolved, shaped by Indo-Pacific convergence, supply-chain resilience, defence industrial cooperation, green hydrogen, critical technologies and skilled mobility.
  - Germany has committed to providing India with EUR 10 billion by 2030 within their 2022 Partnership for Green and Sustainable Development.
  - The marking of **25 years of Strategic Partnership (2025)** and **75 years of diplomatic relations (2026)** reflects the maturity of ties.

What are the Key Areas of Cooperation Between India and Germany?

- **Defence and Security Cooperation**: Defence cooperation has emerged as a key pillar of India–Germany relations, marked by deeper military engagement, strategic dialogue, and defence industrial collaboration.
  - The **Joint Declaration of Intent on a Defence Industrial Cooperation Roadmap** signals a shift from a buyer–seller model to co-development.
  - Germany's participation in **MILAN (Naval exercise), Indian Ocean Naval Symposium, and TARANG SHAKTI (Air exercise)** reflect growing Indo-Pacific convergence, complemented by cooperation in advanced defence technologies such as the **Eurodrone MALE UAV programme.**
  - Progress on frameworks like **reciprocal logistics support, peacekeeping training, and DRDO–BAAINBw** collaboration further strengthens interoperability and strategic trust.
- **Counter-Terrorism Cooperation:** India and Germany unequivocally **condemned terrorism and violent extremism in all forms, including cross-border terrorism.**
  - Germany strongly denounced recent terror attacks in Jammu & Kashmir and Delhi, **reaffirming zero tolerance for terrorism.**
  - The ratification of the **Mutual Legal Assistance Treaty** and progress under the **Joint Working Group on Counter-Terrorism** enhance legal and institutional cooperation.
  - Both sides are committed to strengthening cooperation against terrorist entities, including those **listed under the UN 1267 Sanctions Committee**.
- **Trade, Investment and Economic Cooperation:** Economic engagement forms the backbone of India–Germany relations, with bilateral trade in goods and services crossing **USD 50 billion in 2024**, accounting for over a quarter of India's trade with the EU and sustaining momentum into 2025.
  - **Germany has positioned itself as a gateway for Indian firms** to Europe and advanced technologies.
  - Strong support for the early conclusion of the **India–EU FTA** and the strengthening of the **German-Indian CEO Forum** reflect efforts to institutionalise private-sector cooperation across manufacturing, defence, infrastructure, pharmaceuticals, and energy.
- **Technology, Innovation, Science and Research:** India–Germany ties have increasingly assumed an innovation-led character, anchored in the **Innovation and Technology Partnership Roadmap** covering semiconductors, digitalisation, health, bioeconomy and emerging technologies.
  - A Joint Declaration of Intent on a **Semiconductor Ecosystem Partnership** and another on **critical minerals** aim to strengthen collaboration across R&D, manufacturing, recycling and third-country supply chains, addressing strategic vulnerabilities.
  - The extension of the **Indo-German Science and Technology Centre (IGSTC)** reinforced industry–academia linkages and inclusive innovation in areas such as AI, advanced manufacturing and sustainable production.
    - The proposed Indo-German Centres of Excellence and expanding **ISRO–DLR space cooperation** further institutionalise long-term scientific and technological collaboration.
- **Green and Sustainable Development Partnership:** The Green and Sustainable Development Partnership is a flagship pillar of India–Germany relations, with around **€5 billion** of Germany's **€10 billion commitment (2022–2030)** already deployed or earmarked by the 2026 mid-point.
  - The partnership supports climate mitigation and adaptation, renewable energy, sustainable mobility, biodiversity, circular economy and skilling, while aligning closely with Indian initiatives such asPM e-Bus Sewa, **National Green Hydrogen Mission, solar rooftop expansion, metro rail projects and battery storage**.

- Joint working groups on **solar manufacturing, wind energy and energy storage** strengthen cooperation on technology, standards and resilient supply chains.

- **Global Governance and Strategic Convergence:** India and Germany reaffirmed support for a **free, open and rules-based Indo-Pacific**, grounded in UNCLOS and international law, and institutionalised strategic coordination through a new Indo-Pacific consultation mechanism, complemented by Germany's engagement in the **Indo-Pacific Oceans Initiative**.
  - Shared backing for the India–Middle East–Europe Economic Corridor (IMEC) reflects convergence on transparent, sustainable and resilient connectivity.
    - On global governance, both countries reiterate support for **UNSC reforms under the** G4 alliance, including expansion in permanent and non-permanent categories and early text-based negotiations.
  - On global issues, India and Germany expressed concern over the war in **Ukraine**, supported efforts for a just peace under the UN Charter, welcomed progress on **Gaza** in line with UNSC resolutions and reiterated commitment to a **Two-State Solution**.

- **Education, Skilling, Mobility and People-to-People Ties:** People-to-people linkages remain a core pillar of India–Germany relations, reflected in the growing presence of Indian students and skilled professionals in Germany.
  - The **Indo-German Comprehensive Roadmap on Higher Education** strengthens institutional partnerships, joint degrees and research collaboration, while India has invited German universities to establish campuses under the NEP framework.
  - The **Migration and Mobility Partnership** facilitates ethical skilled migration, especially in healthcare and addresses labour-market needs through initiatives such as the **Indo-German Centre of Excellence for Skilling in Renewable Energy**.

What are the Key Areas of Divergence in India–Germany Relations?

- **Strategic Autonomy vs Alliances:** India and Germany **differ in their approaches to security and strategic alignment**. India follows a **doctrine of strategic autonomy**, seeking flexibility in its external engagements and resisting formal military alliances.
  - **Germany,** in contrast, is **deeply embedded within NATO and EU security architectures**, which shape its defence policies and threat perceptions.
  - For instance, **in the Russia–Ukraine Conflict, Germany** has taken a firm position against Russia, **supplying military aid to Ukraine** and advocating strict sanctions within the EU framework.
    - **India, while expressing concern** over civilian suffering and supporting peaceful resolution, has **avoided condemning Russia explicitly** .

- **Trade Protectionism:** Germany generally aligns with the EU's preference for **sanctions, regulatory conditionalities and trade standards** as tools of foreign policy.
  - India, however, remains cautious about sanctions and extraterritorial trade restrictions, viewing them as disruptive to global supply chains and development goals.
  - For instance, EU regulatory regimes such as the **Carbon Border Adjustment Mechanism (CBAM)**, data protection norms, and environmental conditionalities, which **India sees as potential non-tariff barriers affecting its exports.**
    - India's steel and **aluminum exports** to the EU **fell 24.4%, from USD 7.71 billion in FY24 to USD 5.82 billion in FY25,** underscoring weak European demand and tighter trade norms with the slowdown also spilling over into India–Germany bilateral trade.

- **Climate Action Divergence:** India and Germany broadly cooperate on climate change, yet differences persist over **pace, responsibility and financing**.

- While **Germany advocates** for a rapid, **legally binding "phase-out" of all fossil** fuels to meet 1.5°C targets, **India maintains that "climate justice"** requires a distinction between the **"luxury emissions" of the West and the "survival emissions" of the developing world**.
  - This divergence manifests in **heated negotiations over timelines**, where **New Delhi insists on a "phase-down" approach** that allows for continued coal usage to ensure energy poverty is eliminated before a total transition.
- Germany advocates faster emissions reductions and stricter climate standards, while India stresses **climate justice, equity and common but differentiated responsibilities (CBDR)**.
  - India seeks assured **climate finance and technology transfer**, whereas Germany often operates within broader EU fiscal and regulatory constraints.

- **Defence Exports and Technology Transfer Issues:** Although defence cooperation is expanding, Germany's **stringent export control regimes** and cautious approach to sensitive technologies sometimes slow progress.
  - **India seeks faster approvals, deeper technology transfer and local manufacturing rights,** while **Germany balances commercial interests with domestic political oversight and alliance considerations**.
  - This creates occasional friction in timelines and scope of defence industrial collaboration.
- **Indo-Pacific & China Outlook:** India views China primarily through the lens of **territorial integrity, border security and regional power balance**, whereas Germany's China policy has historically been shaped more by **economic interdependence**, though this is changing.
  - While both support a **free and open Indo-Pacific**, **Germany's engagement is still evolving from an economic to a strategic outlook**, creating differences in urgency and threat perception.
- **Consular and Legal Frictions (The Ariha Shah Case):** A specific, **persistent irritant** in bilateral relations is the **legal dispute over the custody of Ariha Shah, an Indian child taken into German foster care in 2021**.
  - This case has become a **symbol of cultural and legal disconnect,** with the Indian government and public viewing the German state's refusal to return the child as a violation of her cultural and linguistic rights.
  - **India seeks the repatriation of the child** to an Indian foster home **to preserve her identity,** while **Germany maintains that its judicial process is independent and focused solely on "child welfare"** laws.

What Measures are Needed to Strengthen India-Germany Ties ?

- **Institutionalising Strategic Dialogues:** India and Germany must further institutionalise strategic dialogue **beyond episodic high-level visits**.
  - The newly announced **Indo-Pacific consultation mechanism and Track 1.5 Foreign Policy** and **Security Dialogue** should be made regular, outcome-oriented and linked to defence planning, maritime security and cyber security cooperation.
- **Advancing Defence Industrial Cooperation:** A critical measure is the effective operationalisation of the **Defence Industrial Cooperation Roadmap**.
  - Both sides should **move from intent to implementation by fast-tracking co-development** and **co-production projects**, enabling deeper technology transfer and joint intellectual property creation.
  - Germany can benefit from **India's skilled workforce**, **cost competitiveness and scale**, while India gains from **German expertise in precision engineering**, **advanced materials** and **defence electronics**.
- **Push for Acceleration of ndia–EU FTA**: India and Germany should push for **early conclusion and balanced implementation of the India–EU Free Trade Agreement.** This would reduce tariff and non-tariff barriers, improve market access and provide regulatory certainty to businesses.

- Both countries should also **expand cooperation in MSMEs, startups and innovation ecosystems** through joint incubators, easier access to finance and digital platforms.
- **Enhanced Convergence on Climate Action:** India and Germany should deepen climate cooperation by ensuring that ambitious climate goals are matched with **adequate finance, technology transfer and capacity building**.
  - Expanding **concessional finance under the GSDP, scaling joint initiatives in green hydrogen, battery storage and urban mobility**, and co-developing climate-resilient technologies can bridge developmental gaps.
- **Strengthening Cooperation in Emerging and Critical Technologies:** To **future-proof** the partnership, India and Germany must intensify collaboration in semiconductors, AI, quantum technologies, critical minerals, space and biotechnology.
  - Establishing **joint research hubs, shared standards, and coordinated industrial strategies** will reduce dependence on concentrated global supply chains.
  - Facilitating **smoother movement of researchers, engineers and innovators,** along with protection of intellectual property, will further deepen trust and innovation-led growth.
- **Enhancing People-to-People Ties and Skilled Mobility:** People-to-people engagement remains a long-term stabiliser of bilateral relations.
  - Ethical and mutually beneficial skilled migration frameworks, especially in healthcare, renewable energy and advanced manufacturing, should be scaled up under the **Migration and Mobility Partnership Agreement.**
- **Managing Differences through Dialogue and Mutual Sensitivity:** Regular diplomatic dialogue can help address differences on **Russia–Ukraine, human rights discourse, sanctions** and trade regulations such as **CBAM**.
  - Mutual sensitivity to each other's **strategic compulsions, domestic constraints** and development priorities will prevent misunderstandings and preserve trust.
- **Expanding Cooperation in Global Governance and the Global South:** India and Germany should enhance coordination in multilateral forums on UN reforms, climate finance, health security and digital governance.
  - Scaling up triangular **development cooperation in Africa, Asia and Latin America** will combine India's development experience with Germany's financial and technical capabilities.

Conclusion:

India–Germany ties are moving towards a **3D partnership- Defence, Digitalisation and Decarbonisation**—anchored in shared democratic values and strategic trust. By combining **India's scale, skills and growth momentum** with **Germany's technology, capital and industrial strength**, the partnership can become future-ready. Constructive dialogue to manage differences will keep cooperation resilient amid global uncertainty. Together, India and Germany can emerge as **key architects of a secure, sustainable and rules-based global order**.

Building Resilience in India'S Critical Minerals Ecosystem

This editorial is based on "Refining India's future in critical minerals" which was published in The Hindustan times on 12/01/2026. The article examines the growing importance of critical minerals in shaping India's clean energy transition, industrial growth, and strategic autonomy. It analyses policy responses needed to secure resilient and sustainable mineral supply chains.

Critical minerals have become the **strategic backbone of the 21st-century** economy, supporting modern technologies. As the global shift towards renewables accelerates, control over mineral supply chains is **reshaping geopolitics and economic competitiveness**. However, their production and processing remain highly concentrated, creating supply risks and strategic vulnerabilities. For India, **achieving net-zero goals, Atmanirbhar Bharat and advanced manufacturing makes secure access to critical minerals a national developmental and security imperative**.

What are the Critical Minerals?

- **About:** Critical minerals are those minerals that are **essential for economic development, energy transition, and national security**, but whose **supply chains are vulnerable to disruption** due to import dependence, geopolitical concentration, or limited domestic availability.
  - The **Government of India** has released a list **of 30 critical minerals for India**.
  - These minerals are **Antimony, Beryllium, Bismuth, Cobalt, Copper, Gallium, Germanium, Graphite, Hafnium, Indium, Lithium, Molybdenum, Niobium, Nickel, PGE, Phosphorous, Potash, REE,Rhenium, Silicon, Strontium, Tantalum, Tellurium, Tin, Titanium, Tungsten, Vanadium,Zirconium, Selenium and Cadmium.**
  - They are critical because of:
    - High economic & strategic importance
    - Limited domestic reserves
    - High import dependence
    - Geographically concentrated global supply
    - Difficult substitution
- **Usage:** Critical minerals play a crucial role in **clean energy transition and modern industries**. Their applications can be seen across the following sectors:
  - **Clean Energy**: Critical minerals underpin India's clean energy transition across **solar, wind, electric mobility, and energy storage**.
    - Solar PV manufacturing depends on **silicon, tellurium, indium and gallium**, while wind turbines require **rare earths such as neodymium and dysprosium** for permanent magnets.
    - The rapid scale-up of **EVs and grid-scale storage** under the National Electric Mobility Mission Plan(NEMMP)and renewable integration plans will sharply raise demand for **lithium, cobalt and nickel**.
  - **Electronics and Semiconductors:** Critical minerals such as **gallium, germanium, silicon, indium and rare earth elements** are essential for manufacturing semiconductors, smartphones, computers, LEDs and microchips.
  - **Defence and Strategic Technologies:** Rare earth elements, titanium, tungsten and beryllium are used in **missile guidance systems, radar, fighter aircraft, drones and night-vision devices**. Secure access to these minerals is vital for defence preparedness and strategic autonomy.
  - **Aerospace and Space Technology:** Critical minerals like **titanium, lithium and rare earths** are used in aircraft engines, satellites and space launch vehicles due to their high strength-to-weight ratio and heat resistance. India's expanding **space sector and Gaganyaan mission** will further raise demand.
  - **Nuclear Energy**: **Uranium, zirconium** and rare earth elements are used in **nuclear fuel, reactors and control rods**. As India aims to increase nuclear power capacity to ensure clean base-load energy, the strategic importance of these minerals grows.
  - **Telecommunications and Digital Infrastructure: Copper, rare earths** and **lithium** are crucial for **5G networks, optical fibre cables, data centres and power backup systems**. India's digital expansion under **Digital India and BharatNet** depends heavily on these materials.
  - **Medical and Healthcare Technologies:** Critical minerals such as **rare earths, platinum group metals and cobalt** are used in **MRI machines, X-ray systems, cancer treatment equipment and medical implants**, improving diagnostic and treatment capabilities.
  - **Manufacturing and Advanced Materials:** Tungsten, chromium, nickel and molybdenum are used in **high-strength alloys, stainless steel and industrial machinery**, supporting sectors like construction, automobiles and heavy engineering.
  - **Water Treatment and Environmental Management:** As water scarcity increases, critical minerals are becoming essential for purifying and managing water resources. Rare earth elements **(like lanthanum and cerium)**

are used in **specialized filters** to **remove heavy metals and phosphates** from wastewater.

- **Availability of Domestic Reserves in India:** India has geological potential for several critical minerals such as **lithium, graphite, copper and rare earth elements**, but most of these reserves are **not fully explored or commercially mined yet**.
  - **For example**, lithium reserves have been identified in **Jammu & Kashmir**, but large-scale mining has not started.

What Reforms India has Undertaken with Regard to Critical Minerals?

- National Critical Mineral Mission **(NCMM):** The government has launched the **National Critical Mineral Mission**.
  - The mission focuses on increasing exploration, promoting domestic mining and processing, encouraging recycling, and strengthening research and technology.
  - In the 2024-25 field season, **Geological Survey of India has taken up 195 projects**, including 35 in Rajasthan, **focused on identifying and assessing critical mineral deposits**.
  - Also, it calls for the establishment of the **Center of Excellence (CECM)** to **periodically update the list of critical minerals** and provide technical guidance for processing and value addition.
- **Legislative Reforms:** The Mines and Minerals (Development and Regulation) Amendment Act, 2023 brings major reforms to align India's mining sector with the global focus on critical minerals. It **removes six minerals—including lithium, titanium, and zirconium**, **from the atomic minerals list** to open them up for wider participation.
  - It also introduces an **exploration licence regime** to boost deep-seated and critical mineral exploration.
- **Enhanced Focus on Recycling and Urban Mining:** Since domestic mining takes time, India is promoting **recycling of batteries, e-waste and electronic goods** to recover critical minerals.
  - For instance, the **Incentive Scheme to promote Critical Mineral Recycling** has been allocated Rs.1,500 crore **to develop recycling capacity** in the country for the **separation and production of critical minerals from secondary sources.**
  - This supports a **circular economy** and reduces import dependence.
- **Manufacturing and Processing Push:** The government is encouraging **domestic manufacturing of rare-earth magnets, batteries and semiconductor materials** to move beyond raw material imports and build value chains within India.
  - **For instance, IREL's** efforts to expand rare earth processing and magnet manufacturing**, the** PLI scheme for Advanced Chemistry Cell (ACC) batteries**,** and the Semiconductor Mission supporting fabrication and compound **semiconductor units** reflect India's shift from mineral dependence to value-added manufacturing.
- **Regulatory Streamlining:** In September 2025, the Ministry of Environment, Forest and Climate Change **(MoEFCC) exempted mining projects for atomic, critical, and strategic minerals from public consultations**, citing national security and strategic concerns.
  - However, these projects will **still undergo comprehensive appraisal by sectoral expert committees** and be cleared at the central level, regardless of project size.
- **International Cooperation:** India is partnering with other countries through bilateral and multilateral initiatives to secure stable supplies of critical minerals and invest in overseas mining and processing projects.
  - For instance, KABIL's **overseas partnerships**, including a **lithium exploration agreement with Argentina's CAMYEN SE (covering 15,703 ha of lithium exploration)** and an **MoU with Australia's Critical Mineral Office**.
  - India joined the **US-led** Minerals Security Partnership (MSP) Finance Network to secure sustainable supply chains for critical minerals.

- In addition, India is leveraging **Quad cooperation (India–US–Japan–Australia)** and **Indo-Pacific economic initiatives** to diversify sourcing, secure off-take agreements, and reduce strategic import vulnerability.

What are the Major Obstacles India Faces In Ensuring Access and Security Of Critical Minerals?

- **High Import Dependency:** India is **almost entirely import-dependent** for minerals like lithium, cobalt and nickel (100% import dependency in FY 2024).
  - Global supply chains are **highly concentrated**, with **China** dominating refining and processing(with over 90% processing), exposing India to price shocks, export controls and geopolitical coercion.
    - For instance, **China's 2025 export controls on rare-earth elements and permanent magnets have exposed India's vulnerability** due to its heavy import dependence.
  - This situation is likely to continue as the, as per the Institute for Energy Economics and Financial Analysis (IEEFA) report, **India's demand** for critical minerals is **expected to more than double by 2030.**
- **Limited Domestic Exploration:** India's exploration intensity is low due to **inadequate geoscientific data, limited private participation, and high exploration risk**.
  - Many potential reserves lie in **ecologically sensitive or tribal regions**, complicating mining approvals and operations.
  - For example, only **about 10% of India's Obvious Geological Potential (OGP)** has been explored, India spends **less than 1% of global exploration expenditure**, meaning many mineral deposits (including critical minerals) remain undiscovered or poorly assessed.
- **Weak Processing Capabilities:** Even where minerals are available, India lacks **downstream processing, separation, and refining capacity**, especially for rare earths and battery-grade materials.
  - This forces dependence on **foreign value chains**, undermining strategic autonomy.
  - For instance, India has about **6.9 million tonnes of rare** earth reserves ranking among the world's top three, but its actual contribution to global rare earth production is **below 1%** because it **currently lacks the capability to refine these minerals** into the high-purity metals or alloys required for magnets and advanced technologies.
- **Resource Nationalism and Asymmetric Geopolitical Competition:** Rising global demand has triggered **resource nationalism**, long-term off-take locking, and strategic stockpiling by major powers.
  - India faces stiff competition from **China, the US and the EU** in accessing overseas mineral assets.
    - Securing long-term **"offtake agreements"** is difficult when rival nations offer massive infrastructure-for-minerals deals that India, with its current fiscal constraints, struggles to match.
  - For instance, Between 2018 and the first half of 2021, Chinese companies **invested USD 4.3 billion to acquire lithium assets, twice the amount invested by companies from the United States, Australia and Canada combined** during the same period.
- **Environmental-Social Conflicts:** Critical mineral mining involves **high ecological footprints**, water stress and displacement risks. Balancing **sustainability,** and faster clearances remains a major governance challenge.
  - For instance, globally, the **Democratic Republic of the Congo (DRC)**, which accounts for about **70% of global cobalt supply**, highlights serious ESG challenges in critical mineral mining.
  - In India the proposed **tungsten mining project at Nayakkarpatti near Madurai in Tamil Nadu** triggered strong local protests due to concerns over **groundwater depletion, damage to agricultural livelihoods and impacts on nearby biodiversity-rich areas**.
- **Recycling Constraints:** India lags in **advanced extraction technologies, mineral substitution, and large-scale recycling (urban mining)**. Low recovery

rates from e-waste limit the potential of circular economy solutions.
  - India generates nearly **1.75 million tonnes of e-waste annually** and about **60 kt of spent lithium-ion batteries**, offering significant potential to recover critical minerals like lithium, cobalt and nickel.
  - However, due to **limited large-scale and advanced recycling infrastructure**, much of this recoverable resource remains untapped.
- **Commercial Risks:** Overseas mining projects require **high capital, long gestation periods, and face political risks** in host countries. Limited risk appetite among Indian PSUs and private players constrains strategic investments.
  - For instance, projects like the **Adani Carmichael mine in Australia (though a coal mine)** faced nearly a decade of delays due to prolonged legal battles over environmental clearances and local protests.
- **Extreme Price Volatility and Market Risk:** The market for critical minerals is small and opaque compared to oil, making it prone to **"predatory pricing"** where dominant players can crash prices to make new Indian mining projects unviable. Without a **"Price Floor" mechanism or guaranteed domestic offtake**, private Indian firms are hesitant to commit the billions needed for long-term infrastructure.
  - For instance, **lithium prices crashed by nearly 80% between 2022 and 2024**, despite long-term demand growth.
  - Such volatility can render new mining projects commercially unviable, discouraging Indian private firms from committing large capital in the absence of **price-floor mechanisms or assured domestic offtake**.

What Measures Needed to Future-proof India's Critical Minerals Ecosystem?

- **From Resource Mapping to Discovery-Led Exploration:** India must move beyond basic geological surveys to **deep, technology-driven exploration** using **AI, hyperspectral imaging and 3-D geophysics.**
  - Opening high-quality geoscience data and **de-risking early-stage exploration** through state **support can crowd-in private investment**, as **seen in Australia and Canada.**
- **Build End-to-End Domestic Value Chains:** Mining alone is insufficient. India must invest in **processing, separation and refining**, especially for **rare earths and battery-grade materials**, where China currently dominates.
  - Targeted fiscal incentives, anchor-firm models and clustering near ports can help India move up the value chain.
- **Make Recycling a Strategic Mineral Source:** Urban mining should be treated as a **third pillar of mineral security** alongside domestic mining and overseas assets.
  - Scaling **formal e-waste and battery recycling**, adopting advanced hydrometallurgical technologies, and **enforcing EPR** can convert waste into a strategic resource.
- **Strengthen Overseas Mineral Security**: India should pursue **equity stakes, long-term offtake agreements and joint ventures** in resource-rich regions like Africa, Latin America and Australia.
  - Strengthening KABIL, offering sovereign guarantees and aligning with platforms like the **Minerals Security Partnership** will enhance competitiveness against China, the US and the EU.
- **Integrate ESG with Faster Clearances:** Future readiness requires **socially legitimate and environmentally responsible mining**.
  - Streamlining approvals while ensuring genuine consultation under **Forest Right Act (FRA) and PESA** , benefit-sharing with tribal communities and strong rehabilitation frameworks will reduce conflict and project delays.
- **Invest in R&D:** India must reduce vulnerability by investing in **alternative battery chemistries (sodium-ion, zinc-air)**, rare-earth substitution, and material efficiency.
  - Linking Centres of Excellence with DRDO, academia and industry integration can drive strategic innovation.

- **Create Strategic Reserves:**
  - Just as crude oil reserves protect energy security, **strategic stockpiles of lithium, cobalt and rare earths** can shield India from supply disruptions, export controls and price volatility.

Conclusion:

Critical minerals constitute the **infrastructure of the future**, silently powering clean energy, digitalisation, and national security. For India, the challenge lies in balancing **strategic security, environmental sustainability, and resource sovereignty** while scaling access to these minerals. A calibrated approach—combining domestic capability, responsible mining, and global partnerships—aligns closely with the vision of **Atmanirbhar Bharat**. Such a strategy will not only advance the **SDGs** but also anchor India's **long-term strategic autonomy** in a resource-constrained world.

Reimagining India'S Consumer Price Index

This editorial is based on "Moving on: On India's Consumer Price Index and a new base year" which was published in The Hindu on 15/01/2026. The article highlights the significance of recent CPI base-year revision and allied reforms in making inflation measurement more representative of India's evolving consumption patterns.

Consumer Price Index **(CPI), a key measure of retail price movement**, stood at **1.33% year-on-year in December 2025**, significantly below the Reserve Bank of India's range of (2% to 6%) target band, reflecting subdued price pressures in the economy. Despite this benign headline number, the CPI data masks **persistent negative food inflation and divergent rural-urban trends**, complicating the policy narrative. With a **revised CPI series (base 2024)** set to be released soon, cost-of-living concerns linger among vulnerable households, understanding CPI's dynamics is vital for balanced policy responses.

What is the Consumer Price Index (CPI)?

- **About: Consumer Price Index (CPI)** is a statistical measure that tracks the **average change over time in the prices paid by consumers for a fixed basket of goods and services** used for daily consumption.
  - The other index, Wholesale Price Index (WPI) measures the average change in prices of goods at the wholesale or producer level.
  - India's **retail inflation**, measured by the Consumer Price Index (CPI), stood at **1.33% in December 2025.**
- Key Types of CPI:
  - **CPI Combined (Rural+Urban):** Base year: 2012, **used as the headline inflation indicator** and for **RBI's monetary policy (inflation targeting)**.
  - **CPI for Industrial Workers (IW)**: Base year: 2016, **used for Dearness Allowance (DA) revision** of industrial and central government employees.
  - **CPI for Agricultural Labourer (AL):** Base year: 2019, used to track the cost of living changes (inflation) for agricultural workers in India, used for **wage fixation and social security analysis**.
  - **CPI-Rural Labourers (CPI-RL)**: Base year: 2019, measures price changes faced by rural labour households, used for fixing minimum wages and evaluating rural livelihood conditions.
    - The National Statistical Office (NSO) releases **CPI-Combined, CPI-Rural, and CPI-Urban** for measuring retail inflation and policy use, while the **Labour Bureau** releases **CPI-Industrial Workers, CPI-Agricultural Labourers, and CPI-Rural Labourers** mainly for wage fixation, DA revision, and labour welfare purposes.
- **Components**:
  - **Food and Beverages (45.86%)** - Highest weight
  - **Miscellaneous (28.32%)** - Health, education, transport
  - Housing (10.07%)
  - Fuel and Light (6.84%)
  - Clothing and Footwear (6.53%)
  - Pan, Tobacco, and Intoxicants (2.38%)

What is the Difference between Consumer Price Index and Wholesale Price Index?		
Aspect	**Consumer Price Index (CPI)**	**Wholesale Price Index (WPI)**
Meaning	Measures average price changes at the retail / consumer level	Measures average price changes at the wholesale / producer level
Inflation Type	Retail or cost-of-living inflation	Wholesale or producer inflation
Compiled by	National Statistical Office (NSO), MoSPI	Office of Economic Adviser (OEA), Ministry of Commerce & Industry
Base Year	2012 = 100 (revision underway to 2024)	2011–12 = 100
Use by RBI	Used for inflation targeting	Not used for inflation targeting

What are the Key Issues Associated with India's Consumer Price Index?

- **High Food Weight Bias:** Food and beverages carry nearly **46% weight** in CPI-Combined, making inflation highly sensitive to **monsoon shocks, supply disruptions, and food price volatility**, often overstating generalized inflation.
  - For instance, in **June 2024**, a sharp spike in **vegetable prices pushed headline CPI above the RBI's tolerance band**, even as **core inflation (excluding food and fuel) remained relatively moderate**.
- **The "Digital Blindspot"- Invisible Modern Services:** Rapid urbanisation and rising digital services consumption are not adequately reflected in CPI, leading to **limited representation of urban middle-class inflation pressures**.
  - The index **excludes the post-2016 digital revolution,** ignoring essential modern expenditures like **smartphones, 5G data packs, OTT subscriptions, and gig-economy.**
    - By failing to track these **"new necessities,"** the CPI significantly **underreports the true cost of living** for the average Indian family today, especially in urban areas.
- **Supply-Side Driven Inflation Dominance:** CPI inflation in India is frequently driven by **supply shocks (food, fuel, logistics)** rather than demand, reducing the effectiveness of **interest rate–based monetary policy**.
  - India **imports nearly 85% of its crude oil requirement**, making domestic inflation highly vulnerable to global price shocks.
    - For instance, the post-Ukraine war surge **in crude prices in 2022 sharply raised fuel and transport costs**, feeding into CPI despite subdued domestic demand.
- **Limited Regional Granularity:** CPI provides national and broad rural-urban estimates but **fails to capture sharp inter-state and city-level price differentials**, limiting its usefulness for state-specific policy responses.
  - For instance, **food inflation in urban centres such as Bengaluru and Hyderabad surged sharply during the 2022–23 vegetable price shocks**, while several eastern and northern states experienced relatively milder price increases, yet **CPI reported only an averaged national trend**.
    - This masking of **inter-state and city-level price stress** limits the ability of state governments to design **targeted fiscal, tax, or market interventions** based on local inflation realities.
- **Disconnect with Wage Inflation:** CPI inflation does not always align with **wage growth**, especially in the informal sector, leading to **erosion of real incomes** despite moderate headline inflation.
  - For instance, even as **headline CPI inflation fell to around 1.3% in December 2025**, weak wage growth, reflected in **average monthly earnings of about ₹24,400 in urban areas and ₹17,000 in rural areas (PLFS 2023–24) meaning** that many informal and low-paid workers continued to face an **erosion of real incomes**, exposing the disconnect between price stability and livelihood security.

- **Structural Underestimation of Housing Inflation:** The CPI Housing index, with a **weight of 10.07%**, relies **heavily on outdated frozen rentals** and government housing data **instead of reflecting dynamic, market-linked rental trends**.
  - It also excludes **"imputed rent"** for rural households. As a result, the index significantly **understates the true cost of living,** where real estate cycles substantially erode household purchasing power.
- **Informal Market Issues:** Price collection from informal markets makes it difficult to adjust for **quality improvements, shrinkflation, and disguised price rises**, affecting accuracy.
  - For example, in **informal retail markets**, packaged food items often experience **shrinkflation(ie, reduced quantity at the same price or silent quality downgrades**) which are not fully captured in recorded prices.
    - As a result, **households face a higher effective cost of living than CPI indicates**, leading to an underestimation of real inflation pressures.

What Measures are Needed to Strengthen India's Consumer Price Index?

- **Rebalancing Excessive Food Weight**: With food and beverages accounting for nearly 46% of CPI-Combined, India's headline inflation remains disproportionately influenced by supply-side shocks.
  - A gradual rebalancing of weights, **consistent with Engel's Law (that states that as a household's income increases, the percentage of income spent on food decreases, even if the absolute amount spent on food rises) and rising incomes,** along with greater emphasis on core inflation for policy signalling, would improve monetary transmission without ignoring food security concerns.
- **Strengthening Regional CPI:** India's CPI framework largely provides national and broad rural–urban indices, masking significant inter-state and intra-urban inflation variations.
  - **Expanding the network of price collection centres and publishing state-level and major city-level CPI indices** would enable decentralised inflation management and improve Centre–State coordination in addressing region-specific price pressures.
- **Improved Measurement of Housing and Services Inflation:** Despite rapid urbanisation, **housing and services inflation remains underrepresented in CPI** due to limited rental market coverage and methodological constraints.
  - There is a need to better capture **urban rental trends, private education fees, healthcare costs, and transport services**.
  - **Integrating administrative datasets** such as **municipal rental records, school fee structures, and insurance premiums,** along with strengthening urban price surveys, would align CPI more closely with real cost-of-living conditions.
- **Managing Supply-Side Inflation:** A significant portion of CPI volatility in India stems from supply-side factors, which are beyond the immediate control of monetary policy.
  - Such inflation episodes **require non-monetary interventions including buffer stock management, calibrated trade policies, logistics improvements**, and market reforms.
    - Strengthening **institutional coordination between the RBI and line ministries dealing with agriculture, food, and commerce** would prevent over-reliance on interest rate tools to address structurally induced price pressures.
- **Unmask Hidden Inflation in Informal Markets**: CPI price collection in India relies **heavily on informal markets, where quality variation, shrinkflation, and product substitution are common**, often leading to understated inflation.
  - Drawing on recommendations from the **OECD Manual on CPI Measurement,** India needs to adopt hedonic pricing methods and digital price tracking to adjust for quality changes.
  - **Leveraging GST data, e-commerce prices, and scanner data** would improve accuracy and ensure CPI reflects real changes in consumer purchasing power rather than nominal price stability.
- **Reducing Seasonal Volatility Through Structural Reforms:** Seasonal fluctuations in agricultural prices continue to cause sharp month-to-month volatility in CPI readings, complicating policy responses.
  - The **Dalwai Committee on Doubling Farmers' Income have emphasised investments in cold storage, food processing, post-harvest infrastructure**, and market integration through platforms such as e-NAM.
  - These structural reforms would **reduce wastage, smoothen supply chains, and stabilise consumer prices,** making CPI a more reliable indicator for macroeconomic management.

Conclusion:

While CPI remains India's official measure of retail inflation, its long reliance on the **2012 base year** limited its ability to reflect changing consumption patterns, services inflation, and urban cost pressures. The **ongoing**

base revision to 2024, based on the latest Household Consumption Expenditure Survey, marks a crucial step toward improving representativeness, weights, and item coverage. Along with better **regional granularity and use of core inflation indicators,** this reform will strengthen monetary policy transmission. A **regularly updated CPI will thus better capture real cost-of-living changes** in a rapidly transforming Indian economy.

Revamping India'S Space Ecosystem

This editorial is based on "A call to reenergise the Indian space ecosystem" which was published in The Hindustan Times on 15/01/2026. The article examines how recent launch setbacks have exposed structural, strategic, and institutional weaknesses in India's space ecosystem. It argues that strengthening space governance is essential for India's national security in the coming decade.

India's space ecosystem, anchored by **ISRO**, has evolved from a developmental programme into a strategic and commercial domain, with India emerging as one of the **six countries with end-to-end space capabilities**. Despite achieving landmark missions and once holding **35% of the global small satellite launch market (2017)**, India's share has declined sharply due to launch, manufacturing, and policy bottlenecks recently underscored by the **PSLV-C62 mission failure in January 2026.** In an era where space underpins **navigation, communication, disaster management, and military operations**, the robustness of India's space ecosystem has become a core national development imperative.

What is the Current Development in India's Space Sector?

- **Human Spaceflight- Gaganyaan Mission:** ISRO is preparing for the G1 Mission, the first uncrewed orbital test flight.
  - This critical test will carry the robotic payload **"Vyommitra" (a humanoid robot)** to simulate human functions and validate life support systems in space.
  - The first crewed flight, which will carry **4- Indian astronauts (Gaganyatris)** to Low Earth Orbit (LEO), is currently targeted for 2027.
  - These flights are specifically designed to test **abort scenarios across ascent phases** and the reliability of indigenous **life-support and environmental control systems**.
- **Sustained Push Towards NextGen-Launch Vehicles:** Though**,** ISRO successfully launched its heaviest satellite ever, the **BlueBird Block-2, weighing 6,100 kg** using the LVM3-M6 rocket in December, 2025.
  - A calibrated shift in India's launch strategy now centres on the **ISRO's** Next Generation Launch Vehicle (NGLV), designed to place **up to 30 tonnes in Low Earth Orbit**, marking a decisive move towards heavy-lift and reusable-class capabilities.
    - The NGLV programme is intended to restore confidence through **repeatability and cadence**, focusing on stage-level performance validation rather than payload novelty.
  - Additionally, the new small satellite launch site at **Kulasekarapattinam** is being developed to exclusively support **SSLV and private launches**.
    - This dedicated spaceport will institutionalise private participation by offering industry **a demand-driven launch access**, strengthening India's commercial launch ecosystem.
- **Commercial Growth & Economic Scale:** India's space economy is valued at **US$ 8.4 billion (2% global share)** and is projected to grow to nearly **US$ 44 billion (8% global share) by 2033**, driven by rising private participation in satellite manufacturing, launch services, and downstream data applications.
  - For instance, NewSpace India Ltd securing commercial launch contracts for international customers and private firms like **Dhruva Space** executing **end-to-end satellite missions for global clients,** signalling scalable commercial maturity enabled by policy reforms.
- **Strengthening National Security Through Space-Based Surveillance:** India is advancing **space-based**

surveillance constellations, with plans to deploy **up to 52 remote sensing and intelligence satellites by 2029–30** to enhance national security and real-time situational awareness.

- Recent progress includes **Indian Space Research Organisation** supporting defence-dedicated Earth observation satellites and the operationalisation of space security frameworks under the **Defence Space Agency**, strengthening monitoring of borders, maritime domains, and critical assets.

- **Rising Role of Private Sector in India's Space Projects**: India's private space ecosystem has seen concrete momentum in recent years, backed by regulatory support from **IN-SPACe** and commercial facilitation by **NewSpace India Ltd**.
  - IN-SPACe has launched the **Satellite Bus as a Service (SBaaS)** initiative to give private players access to flight-ready satellite platforms, further lowering entry barriers and boosting innovation.
  - India hosts **300+ space start-ups** across launch systems, satellite manufacturing, propulsion, Earth observation, and downstream analytics, reflecting rapid private-sector scaling.
    - Flagship milestones such as **Skyroot's Vikram-S**, **Agnikul's Agnibaan SOrTeD**, and **Pixxel's hyperspectral constellation development** signal rising technological maturity and commercial readiness.
- **Blueprinting Sovereign Orbital Presence (Bharatiya Antariksh Station):** India is currently architecting its permanent sovereign footprint in space through the developmental phase of the Bharatiya Antariksh Station (BAS), moving from design concepts to hardware procurement to secure a strategic orbital outpost by 2035.
  - This pre-operational phase focuses on critical technology demonstrations like docking and module integration, laying the foundation to bypass the ISS for future microgravity research and lunar gateways.
  - The **Union Cabinet formally approved** the roadmap in September 2024, **targeting the first module BAS-1 launch by 2028**.
- **Fiscal & Regulatory Liberalization:** The government has **engineered a financial structural reform by removing regulatory bottlenecks** and **injecting risk capital, directly addressing the "valley of death"** faced by deep-tech space startups.
  - India now **permits up to 100 percent foreign direct investment (FDI)** in space sectors like **satellite manufacturing** and **operation, satellite data products**, and ground segment and user segment.
- **High-Tech Diplomacy & Global Surveillance**: Space has become a central pillar of India's foreign policy, leveraging high-resolution surveillance data as a diplomatic asset through collaborations like the iCET (Initiative on Critical and Emerging Technology) with the US.
  - For instance, **the NASA-ISRO SAR (NISAR) satellite (launched mid-2025)** utilizes dual-frequency L-Band and S-Band radar to map Earth's landmass **every 12 days with centimeter-level precision.**
  - Also, India's participation in the Artemis Accords facilitates access to advanced training, technological advancements, and scientific opportunities.

What are the Key Issues Associated With India's Space Sector?

- **Launch Reliability Crisis Affecting Strategic Credibility:** The **PSLV-C62 failure (2026)** marked the **5th ISRO launch failure in 7 years**, directly impacting India's credibility as a dependable launch provider.
  - The **failure comes less than a year after the PSLV-C61 mission** in May 2025 was **declared unsuccessful due to a third-stage motor issue.**
  - In the commercial space market, **perceived reliability** matters more than cost, this has resulted in India losing its **35% share of global small-satellite launches (2017) to almost zero by 2024**, while SpaceX achieved over **130 successful launches in 2024 alone**.
- **Structural Bottleneck**: India's space launch capacity remains structurally constrained by its **near-exclusive dependence on the Satish Dhawan Space Centre** at

Sriharikota, in sharp contrast to **China**, which operates **with 4-5 launch sites**, and the **United States**, with multiple civilian and military spaceports.

- This limits India's ability to conduct **responsive or surge launches**, which are critical for rapid satellite replenishment during crises or wartime.
- It also means **weather-related disruptions at Sriharikota can cascade across the entire mission calendar**, delaying civilian, commercial, and strategic launches simultaneously.

- **Navigation Sovereignty at Risk**: India requires **seven operational NavIC satellites** for assured regional coverage, but as of 2026 only **four are fully functional**, **two are nearing end-of-life**, and **NVS-02 (2025) failed to reach its final orbit**, weakening system reliability.
  - This erosion **undermines missile guidance, UAV navigation, logistics precision, and civilian positioning services**, compelling continued reliance on foreign systems, most notably those of the **United States**, despite hard-learned lessons on strategic denial risks during Kargil war.
- **Delayed ITU Filings and Loss of Orbital Sovereignty:** Delayed filings by **India** at the **International Telecommunication Union** contrast sharply with early, large-scale claims by the **United States** and **China**, risking permanent loss of prime **GEO orbital slots** and future spectrum access.
  - This could **lock India out of emerging mega-constellations** and **weaken its bargaining power in global space governance** critically, since **orbital positions are finite and delays translate into irreversible strategic disadvantage**.
- **Weak Military Space Architecture:** India's **Defence Space Agency** (established in 2019) remains under-empowered, largely a coordinating body without full operational command authority and continues to function in silos across **Army–Navy–Air Force data streams.**
  - In contrast, the **United States Space Force** operates as an independent armed service.
    - Even **Pakistan** has moved ahead with a **fully operational Space Command (2024)** integrated with cyber warfare, highlighting India's relative institutional lag.
- **Over-Dependence on Foreign Intelligence, Surveillance and Reconnaissance (ISR) Data:** During Operation Sindoor, India faced significant limitations with its indigenous satellite revisit times (**often up to 14 days for specific locations**).
  - This forced the armed forces to **rely on international commercial providers like Maxar for daily high-resolution imagery** used in target validation and damage assessment.
  - In contrast, **China provided Pakistan with high-resolution imagery from its Gaofen satellites in near real-time, with latencies of less than seven-tenths of a second according to signals intelligence intercepts conducted by the Atlantic Council in 2025**, underscoring asymmetries in ISR support.
    - Such dependence heightens risks of **data denial, selective access, and strategic surprise**, especially during crises.
  - Moreover, India's space-based **electronic intelligence (ELINT)** capability remains limited to a single dedicated satellite (**EMISAT**), with no persistent ELINT or Space Situational Awareness constellations, reinforcing dependence on foreign **ISR** data.
    - In contrast, China's **Yaogan reconnaissance satellite network**, with integrated ELINT capabilities, provides continuous space-based surveillance, giving it a decisive advantage in ISR dominance**.**
- **Commercial–Strategic Disconnect:** India permits deep market penetration by foreign platforms such as **Google Maps**, despite domestic alternatives like **MapmyIndia** offering **superior local accuracy**, and India is also welcoming satellite internet players like **Starlink**.
  - This is strategically risky, given instances where **Starlink access was selectively restricted during the Ukraine conflict**, highlighting vulnerability to external control.
  - Such openness risks **data leakage, revenue loss, and strategic dependence**, in sharp contrast to

China, which tightly restricts foreign GNSS and mapping dominance to preserve sovereignty.

- **Space Situational Awareness (SSA) Gaps:** As India expands its assets (NavIC, IRS), its ability to track lethal micro-debris (<10cm) is growing but remains insufficient compared to the exponential growth of debris in LEO, risking catastrophic **"Kessler Syndrome" events for BAS.**
  - The current **NETRA project coverage** is limited geographically and optically compared to US/ Russia, leaving Indian assets vulnerable to **"blind spot"** collisions in increasingly congested orbits.
    - For instance, ISRO has carried out 122 Collision Avoidance Manoeuvres (CAM) for its Earth Orbiting Satellites in the last 14 years
- **Component Dependency & Supply Chain Vulnerability:** Despite **"Atmanirbhar Bharat,"** the sector retains a critical **vulnerability in high-grade space electronics, traveling wave tubes (TWTs), and carbon fiber**, where reliance on imports exposes programs to geopolitical supply shocks.
  - The slow pace of indigenizing **"space-grade"** semiconductors means that strategic missions remain tethered to the export control policies of Western nations or supply constraints from Taiwan.
    - For instance, India's expenditure on space technology imports is twelve times greater than its revenue from space-related exports.
- **Vision–Execution Gap in Reforms:** While **IN-SPACe** has formally opened India's space sector to private participation, **key execution gaps persist** on the ground.
  - Private players still lack **assured and predictable launch access**, defence-grade satellite demand signals remain unclear, and funding depth is thin compared to **China**'s state- and military-backed space ecosystem.
  - These constraints collectively limit India's ability to **scale large constellations and achieve sustained space-domain dominance**.

What Measures are Needed to Strengthen India's Space Sector ?

- **Restore Launch Reliability & Scale Launch Frequency:** India must shift from mission-centric testing to **fleet-level reliability engineering**, adopting practices used by **SpaceX** such as block upgrades, rapid feedback loops, and incremental design validation.
  - A dedicated **Launch Assurance Fund** should be ring-fenced to absorb failures without stalling launch cadence.
  - Simultaneously, in short term clear role separation across launch vehicles, **PSLV for commercial missions, LVM3 for strategic and human spaceflight, and SSLV for responsive and smallsat launches,** will help avoid bottlenecks and improve overall system resilience.
- **Build Redundant & Responsive Launch Infrastructure:** India must move beyond single-site dependence by operationalising **multiple spaceports** along the eastern seaboard and developing complementary western and southern launch options to de-risk weather disruptions and enhance resilience.
  - Facilities such as **Kulasekarapattinam**, alongside **Satish Dhawan Space Centre**, can enable faster turnaround and distributed launch capacity.
  - In parallel, creating **dedicated military launch windows** with pre-integrated satellites will allow true **"launch-on-demand"** capability for rapid wartime replenishment and crisis response.
- **Secure Orbital Slots & Spectrum at War Footing:** India must establish a **National ITU Task Force** to rapidly fast-track filings for **GEO, LEO, and MEO orbits** at the **International Telecommunication Union**, with priority to mega-constellations and dual-use payloads.
  - Orbital slots and spectrum must be treated as **strategic real estate**, because once these finite positions are lost to early movers, they are **irrecoverable and permanently weaken national space power**.

- **Rebuild Navigation Sovereignty (NavIC 2.0):** India must accelerate **NavIC satellite replenishment** to ensure over 7 **operational satellites at all times**, backed by on-orbit spares and faster replacement cycles under **Indian Space Research Organisation**.
  - NavIC compatibility should be **mandated and incentivised** across smartphones, vehicles, UAVs, and critical infrastructure through standards and procurement norms.
    - Deep integration of NavIC with **missiles, drones, logistics networks, and disaster-response systems** is essential to ensure resilience in GPS-denial and conflict scenarios.
- **Create a Full-Spectrum Military Space Architecture:** India must establish a fully empowered **Space Command** with clear operational authority, specialist space cadres, and an independent budget line.
  - This command should move away from single-satellite missions towards **constellation-based architectures** for ISR, ELINT, and Space Situational Awareness, ensuring persistent coverage through formation flying and redundancy.
  - Crucially, space-derived data must be fused into a **Common Operating Picture** shared seamlessly across the Army, Navy, and Air Force to enable real-time, joint decision-making in multi-domain operations.
- **Reduce Dependence on Foreign Data & Satcom:** India must establish **sovereign ISR baselines** for border surveillance, maritime domain awareness, and crisis response, with foreign satellite data used only as a secondary supplement.
  - In satellite communication partnerships with foreign firms, strict safeguards are essential, including **data localisation, assured access guarantees, and kill-switch protections**, to prevent service denial during geopolitical crises.
  - Such measures are vital to protect strategic autonomy and avoid vulnerabilities exposed during past military operations.
- **Harden Against Counter-Space Threats:** Given the growing threat of jamming, cyber intrusion, and proximity manoeuvres, India must invest in **satellite resilience** through redundancy, rapid reconstitution capability, orbital maneuverability, strong encryption, and on-orbit servicing.
  - This should be complemented by expanding **Space Situational Awareness (SSA)** networks—both ground- and space-based—to enable early detection of hostile actions. Rather than relying on escalatory counter-space weapons, India should pursue **deterrence-by-resilience**, ensuring that its space systems can survive, adapt, and continue functioning under attack.
- **Align Commercial Growth with Strategic Needs:** To scale its private space ecosystem, India should adopt **anchor procurement models**, where the government commits to long-term offtake for civil and defence services, thereby de-risking private satellite constellations.
  - Access to **export finance, insurance, and credit guarantees** will allow Indian launch and satellite firms to compete internationally.
  - At the same time, policy focus must shift towards building strong **downstream demand** in sectors such as agriculture, urban planning, disaster management, and climate services, enabling India to capture greater value beyond launches alone.

Conclusion:

In the coming decade, India's space sector must transition from mission-led achievements to **ecosystem-scale capability building**, anchored in strategic clarity and execution discipline. The **IN-SPACe Decadal Vision and Strategy** rightly emphasises private-sector integration, enhanced launch capacity, and downstream value creation as the growth engines of India's space economy. However, **translating this vision into outcomes will require empowered military space governance, assured data sovereignty, and time-bound accountability across institutions.** Only then can India secure strategic autonomy, economic competitiveness, and credible deterrence in an increasingly contested space domain.

Revamping India'S Manufacturing Sector

This editorial is based on "Keeping India open and secure" which was published in The Financial Express on 15/01/2026. The article argues that India's manufacturing growth depends on openness to imports, global capital, and technology, alongside strong protection of strategic sectors. It calls for replacing blanket restrictions like Press Note 3 with a transparent, risk-based investment screening system to boost exports.

India is reviewing its Foreign Direct Investment (FDI) framework, especially **Press Note 3 (PN3)**, to support manufacturing exports in electronics, automobiles, and renewables. Export competitiveness depends on importing intermediate and capital goods like integrated circuits and batteries. **Recent reforms** like **Goods and Services Tax** (GST) rationalisation, removal of **Quality Control Orders (QCOs)**, and new **Labour Codes**, point towards a **risk-based FDI screening system**. However, **weak component ecosystems**, and **regulatory uncertainty continue to constrain manufacturing growth**. Addressing these gaps is crucial to make India a globally competitive manufacturing hub.

What are the Current Trends in India's Manufacturing Sector?

- **Share in GDP and Output Trends:** Manufacturing contributes **about 16–17% of India's GDP** and has regained momentum after a weak FY24. The sector remains central to India's medium-term goal of raising manufacturing to **25% of GDP**.
  - As per **Ministry of Statistics and Programme Implementation**, manufacturing GVA growth accelerated in FY25 compared to FY24, driven by automobiles, electronics, and capital goods.
- **Industrial Production Trends:** Manufacturing output has **strengthened, reflected in a sustained expansion** in industrial production and improved capacity utilisation levels.
  - Driven by **8.0% growth in the manufacturing sector,** Index of Industrial Production (IIP) **recorded a 6.7 % year-on-year growth** in November 2025
  - According to **RBI's 65th round of OBICUS survey,** capacity utilisation of manufacturing companies inched **up to 76.8% in the quarter ended March 2024 from 74.7% recorded in the December 2023 quarter.**
- **Manufacturing PMI Trends:** The strong performance of the manufacturing sector was reflected in the **HSBC India** Manufacturing PMI **(Purchasing Managers' Index).**
  - India's manufacturing PMI has consistently remained in the **expansion zone (above 50)**, signalling broad-based improvement in new orders, output, and employment. This **reflects both domestic consumption recovery and export-linked orders.**
  - The PMI rose from **58.4 in June 2025** to **59.1 in July 2025**. This indicates the **fastest improvement in manufacturing conditions in more than 17 years**, showing robust growth in output and demand.

Press Note 3 (2020)

About: To prevent **opportunistic takeovers of Indian companies during the COVID-19 crisis**, the Government introduced **Press Note 3 (2020)** in April 2020.

- Under this rule, **any investment from countries sharing a land border with India**, or where the **beneficial owner** is from such countries, can be made **only through the Government approval route**, not automatically.
- The rule also applies **retrospectively**: if ownership of an existing or future foreign investment changes and the beneficial owner falls under this category, **fresh government approval is mandatory**.
- Press Note 3 was enforced through amendments to FEMA **rules**, making violations punishable under law, with enforcement by the **RBI and the Directorate of Enforcement**.

- **Export Trends:** Manufacturing exports are shifting towards **higher-value segments**, especially electronics, pharmaceuticals, and automobiles, strengthening India's role in global value chains. **Export resilience has cushioned external shocks.**

- For instance, **Electronics exports grew eight times from ₹38,000 crore to ₹3.27 lakh crore** during FY 2024–25, led by mobile phone manufacturing clusters in **Tamil Nadu and Uttar Pradesh,** under the PLI scheme.

What Major Reforms are Shaping India's Manufacturing Sector?

- **Rising Manufacturing Growth with Make in India and PLI Scheme: Make in India** shows positive recent trends with record FDI, significant growth in electronics/auto sectors and successes in defence & pharma, boosting self-reliance and job creation,
  - Under **PLI**, sectors like electronics, medical devices, and automobiles have seen measurable growth in production and employment supporting India's exports and reducing reliance on imports.
    - The scheme **has catalysed massive manufacturing expansion**, attracting **nearly ₹2 lakh crore in realised investments across 14 priority sectors** as of late 2025.
    - For instance, **domestic production of Mobile phones** increased from ₹18,000 crore in 2014–15 to ₹5.45 lakh crore in 2024–25, **a 28-fold rise.**
  - Also, India launched the National Manufacturing Mission (NMM) **in the 2025-2026** Union Budget, a significant initiative to boost India's manufacturing growth.
- **Operationalisation of the 4 Labor Codes:** The historic implementation of the four Labor Codes in late 2025 has **replaced a fragmented colonial-era framework with a unified compliance regime**.
  - This allows manufacturers the **flexibility to adjust workforce size based on global demand cycles** (Fixed Term Employment) while **ensuring a universal safety net, effectively removing the "fear of scaling**" that plagued Indian MSMEs for decades.
  - For instance, **for the first time in the country,** social security benefits have been **extended to unorganised, gig and platform workers** under **Sections 113 & 114 of the Code on Social Security, 2020.**.
- **Policy Relaxations to Boost Foreign Investment:** The government is recalibrating strategic sector policies to attract global capital. For instance, The Government of India increased FDI in the defence sector by liberalizing it to 74% through the automatic route and 100% through the government route.
  - This is intended to strengthen **domestic production with advanced technology** and scale manufacturing capacities.
  - Overall, government data shows that **Foreign Direct Investment (FDI) equity inflows into manufacturing rose by 69%,** increasing from ₹8.37 lakh crore (US$ 97.7 billion) in 2004–14 to ₹14.15 lakh crore (US$ 165.1 billion) in 2014–24.
- **Semiconductor Commercialisation & Sovereignty:** 2025 marked the graduation of the **India Semiconductor Mission (ISM) from "policy" to "production."**
  - The strategic shift is to **decouple from Chinese supply chains** by establishing a **domestic fab ecosystem**.
    - This move is **critical not just for electronics but for "future-proofing"** the auto and defense sectors against global chip shortages.
  - For instance, As of August 2025, India has **approved 10 semiconductor projects across six states** with cumulative **investments of ₹1.60 lakh crore**.
    - Also, **four major units (Tata Electronics, Micron, CG Power, Kaynes)** are set to begin commercial production in 2026.
- **Logistics Optimisation via PM Gati Shakti:** The **"Gati Shakti"** platform has successfully broken departmental silos, **allowing for multimodal connectivity that drastically lowers transit times**.
  - By **integrating railways with ports and roads**, the structural disadvantage of high logistics costs, which previously made Indian exports more expensive than Vietnam's, is being neutralized.
  - For example, **India's logistics cost has dropped to 7.97% of GDP**(down from 14%). Also, **118**

Gati Shakti Cargo Terminals were commissioned by late 2025 to facilitate seamless rail-freight movement.

- **MSME Formalisation via Digital Public Infrastructure:** The integration of **MSMEs into the formal economy** is being **driven by the "Digital Public Infrastructure" model** (**ONDC + Udyam**). By **democratizing access to markets and credit,** small manufacturers are being **pulled out of the "dwarfism" trap**, allowing them to supply directly to large global OEMs without expensive intermediaries.
  - For instance, **over 5.70 crore MSMEs are registered** on the **Udyam Registration and Assist Platforms** as of June 2025.
  - Also, Raising and Accelerating MSME Performance (RAMP) Scheme, a **World Bank-supported** Indian government program with a **₹6,062.45 crore outlay**, aiming **to boost** the Micro, Small & Medium Enterprises (MSME) sector's **growth, market access, finance, technology**.
- **Defense Indigenisation & Export Surge:** The aggressive notification of **"Positive Indigenisation Lists"** has effectively ring-fenced the domestic market, **forcing foreign OEMs to form Joint Ventures for local production rather than direct sales**.
  - This structural protection has **allowed private players to mature from component suppliers to full-system integrators,** reducing import dependency significantly while opening global export markets.
  - **Record defence production hit ₹1.54 lakh crore in FY25**, with **exports reaching an all-time high of ₹23,622 crore.**
- **Bio-Manufacturing Revolution (BioE3 Policy):** The rollout of the BioE3 Policy (Biotechnology for Economy, Environment and Employment) positions India to lead the **"Green Industrial Revolution"** by replacing petrochemical-based manufacturing with bio-based alternatives. It creates a new industrial vertical by integrating high-performance biomanufacturing with AI to produce sustainable chemicals, smart proteins, and materials.
  - The policy **focuses on 6 thematic sectors** including bio-chemicals and functional foods. The government is **setting up Bio-AI hubs and Biofoundries to scale lab-innovations to commercial production.**
- **Regional and State-Led Industrial Growth Initiatives:** States are driving **strategic manufacturing zones and export clusters** to decentralise and scale industrial development, supporting MSMEs and larger manufacturers alike.
  - **Gujarat's Saurashtra region** is being developed into a **multi-sector manufacturing and export zone**, integrating clusters in ceramics, automotive parts, and defence manufacturing.
  - In addition, **state-level business and investment summits** such as **Vibrant Gujarat and Global Investors Summits** have facilitated large MoUs, accelerating factory establishment and capacity expansion.

What are the Key Issues Associated with India's Manufacturing Sector?

- **Low Share in GDP and Global Manufacturing:** Despite sustained reforms and growth, India's manufacturing sector has failed to expand beyond 16–17% of GDP.
  - Unlike China or Vietnam, India has not achieved the Lewis turning point, **as surplus labour continues to remain trapped in agriculture or informal services** rather than being absorbed into productive manufacturing.
    - Also, India **holds only 2.8% of the global manufacturing share**, compared to **China's dominant 28.8%**.
  - **Agriculture continues to absorb about 42–45% of the workforce while contributing only ~15% of GDP**, indicating large-scale disguised unemployment, yet **manufacturing employs merely ~11–12% of workers**, far below the levels seen in East Asian economies at comparable stages of development
- **High Import Dependence for Critical Inputs:** India's manufacturing is weakened by **deep dependence on imported intermediate and capital goods**,

especially in high-tech segments such as electronics and semiconductors, because domestic industry has yet to build the upstream inputs that add value and reduce vulnerability.

- In **FY 2023-24, India's total imports of electronic components reached about $34.4 billion**, with **over $12 billion coming directly from China and another $6 billion from Hong Kong**, together supplying **more than half of these critical parts** used in "Made-in-India" products like smartphones and TVs—despite local assembly growth.
- Further Semiconductor imports remain very high, with **chips worth over ₹1 lakh crore imported in 2021–22**, highlighting India's near-total dependence on external fabrication ecosystems.

- **The MSME "Missing Middle":** India's manufacturing suffers from a **persistent scale deficit rooted in the structure of its MSME sector**, where **over 95% of manufacturing enterprises are micro or small units**, many operating informally and below efficient scale.
  - In contrast, East Asian manufacturing clusters, most notably in **China**—are characterised by dense networks of **scaled firms, specialised suppliers, shared infrastructure, and patient credit**, allowing even smaller firms to benefit from agglomeration economies.
- **Logistics and Infrastructure Bottlenecks**: India's manufacturing competitiveness has long been eroded by **logistics and infrastructure inefficiencies**, but recent reforms have only **partially closed the gap rather than eliminated it**.
  - Although India's logistics costs have fallen from **13–14% of GDP to around 7.97%**, multi-modal connectivity remains weaker than best-practice economies like **South Korea.**
  - This results in **longer port delays, higher inventory costs, and weaker reliability** for time-sensitive exports, reducing India's competitiveness in just-in-time global value chains.
- **Skill Mismatch and Labour Productivity:** India's manufacturing paradox lies in **abundant labour but uneven skills and low shop-floor productivity**, reflecting a gap between workforce availability and industrial requirements.
  - Although India produces millions of workers annually, **less than 5% of the workforce has received formal vocational or technical training**, compared to over **50% in countries like South Korea** and **Germany**.
  - As a result, **advanced manufacturing segments such as electronics, precision engineering, and semiconductor packaging** frequently depend on **foreign technicians, expatriate supervisors, or costly in-house retraining**, raising production costs and slowing scale-up.
- **Regulatory Uncertainty and Policy Overhang:** India's manufacturing investment climate continues to be weighed down by **regulatory uncertainty and policy overhang**, where frequent rule changes, layered approvals, and discretionary clearances raise the cost of committing long-term capital.
  - This is evident from **Press Note 3 (2020)**, which mandates prior government approval for FDI from land-bordering countries.
  - While aimed at national security, **opaque approvals taking 6–12 months** have delayed investments even in **low-risk sectors** like auto components, renewables, and electronics ancillaries embedded in global supply chains.
- **Carbon Border Risks (The Green Wall):** The sector's heavy reliance on coal-fired power makes Indian exports vulnerable to **"Green Protectionism" like the EU's** Carbon Border Adjustment Mechanism (CBAM).
  - As Western markets tax **"embedded carbon,"** India's cost advantage in steel, aluminium, and cement is rapidly eroding against green-powered competitors.
  - For instance, although **India's CBAM-exposed exports to the EU account for only 0.2% of its GDP,** the iron and steel sector constitutes **90% of these exports, which can be heavily impacted.**
- **Technology and R&D Gaps:** India's manufacturing ascent is constrained by a **persistent technology**

and R&D gap. India's R&D expenditure remains below 1% of GDP (~0.7%), compared with **over 2–3% in advanced industrial economies such as South Korea and Japan**.

- Also, Indian manufacturing accounts for a **small share of global patents**, limited proprietary designs, and weak standards leadership, forcing firms to compete at the lower rungs of global value chains.

What Measures are Needed to Strengthen the Manufacturing Sector ?

- **Deepen Domestic Value Chains and Technological Capabilities:** India must correct the structural weakness of **assembly-led manufacturing** by building depth in upstream segments such as components, materials, tooling, and capital goods.
  - Without **domestic ecosystems for semiconductors, power electronics, precision machinery, and industrial inputs, manufacturing remains exposed to import shocks** and captures only thin margins.
  - Incentive regimes like PLI should therefore be conditional on **verifiable increases in local value addition, supplier indigenisation, and technology absorption**, rather than gross output.
- **Overcome the "Missing Middle"**: Manufacturing competitiveness requires **fewer but stronger firms**, supported through patient finance, cluster-based common facilities, and structured linkages with large anchor firms.
  - **Without enabling MSMEs to grow into globally competitive** mid-sized manufacturers, India will continue to have many firms, but little industrial power.
- **Restore Manufacturing's Employment-Generating Role:** Manufacturing policy must explicitly confront the problem of **job-light growth**, where output expands without absorbing surplus labour.
  - This requires prioritising **labour-intensive and medium-skill segments** such as components, **food processing, light engineering, and industrial services**, over excessively capital-intensive assembly.
    - Employment outcomes should become a **core metric of industrial policy success**, not a by-product.
- **Shift Logistics Reform from Cost Reduction to Reliability:** While headline logistics costs have declined, Indian manufacturing continues to suffer from **unreliable delivery timelines, port congestion, and fragmented multimodal connectivity**.
  - For global manufacturers, predictability often matters more than average cost. **Strengthening rail–road–port integration, reducing turnaround times,** and ensuring digital coordination across logistics chains are essential to integrate Indian firms into just-in-time global value chains.
- **Close the Skill and Shop-Floor Productivity Gap:** India's labour abundance will not translate into manufacturing strength unless it is matched by **consistent shop-floor skills, process discipline, and quality control capabilities**.
  - The focus must shift from short-term skilling targets to **workplace-based learning, apprenticeship integration, and continuous upskilling**, especially in advanced manufacturing segments.
- **Raise Industrial R&D and Innovation Intensity:** Manufacturing cannot move up the value chain without sustained investment in **applied R&D, product development, and process innovation**.
  - Public policy **must crowd in private R&D by supporting industry–academia collaboration, shared testing facilities**, and risk-sharing for early-stage industrial innovation.
- **Ensure Regulatory Predictability and Policy Credibility:** Manufacturing investment depends as much on **policy certainty** as on incentives. Frequent regulatory changes, delayed approvals, and opaque decision-making raise the cost of long-term capital and encourage firms to defer or divert investments.

- National security–driven regulations must be accompanied by **clear timelines, transparent criteria, and predictable processes**, so that risk management does not become risk aversion.

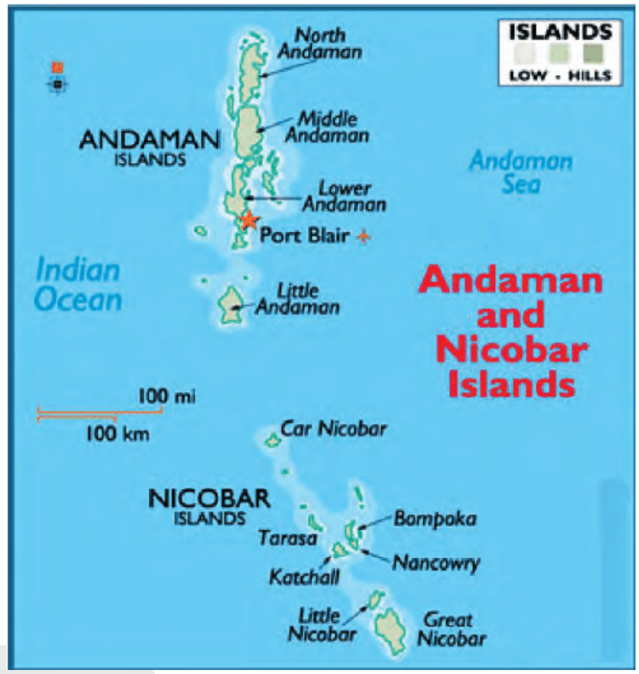
Conclusion:

India's manufacturing challenge lies in converting scale and incentives into **deep capabilities, productive jobs, and technological self-reliance**. A credible strategy must target raising expanding employment to **around 18–20% of the workforce**, reducing import dependence through higher local value addition, and lifting industrial R&D toward **1.5–2% of GDP**. Only a shift from assembly-led growth to **innovation- and productivity-driven manufacturing** can deliver structural transformation, inclusive employment, and long-term economic resilience.

The Development Dilemma Of the Andaman & Nicobar Islands

This editorial is based on "A hidden epidemic in Andaman" which was published in The Hindu on 18/01/2026.This article examines how the Andaman & Nicobar Islands' strategic geography, ecological richness, indigenous communities, and defence significance intersect, revealing the challenges of balancing national security with environmental sustainability and human well-being.

Located at the **strategic maritime crossroads of the Bay of Bengal** and the eastern Indian Ocean, the Andaman and Nicobar Islands form India's easternmost security outpost astride vital international sea lanes. Yet, behind the postcard imagery of turquoise waters and thriving tourism, the islands are grappling with a **silent social crisis, a suicide rate more than three times the national average,** revealing deep-seated stresses within this isolated geography. With a small and scattered **population of around four lakh**, this paradox underscores how strategic importance and natural beauty can coexist with profound human vulnerability.



Andaman and Nicobar Islands

The **Andaman and Nicobar Islands** comprise an archipelago of **over 570 islands stretching over a distance of more than 700 km in a north–south direction at the junction** of the Bay of Bengal and the eastern Indian Ocean.

- Located about 1,300 km from the Indian mainland and in close proximity to the **Malacca Strait** (one of the world's busiest maritime chokepoints) the islands form India's **easternmost frontier and a natural maritime** outpost overlooking vital global sea lanes.

What is the Significance of Andaman and Nicobar Islands for India?

- **Environmental and Biodiversity Sensitivity:** The **Andaman and Nicobar Islands** constitute one of India's most ecologically fragile regions and form part of a **globally recognised biodiversity hotspot** in the **Indo-Burma biogeographic zone.**
  - Nearly **90% of the land area is under forest cover**,the Great Nicobar Biosphere Reserve hosts diverse ecosystems, including tropical wet evergreen forests, rugged mountain ranges rising up to 642 m (Mt. Thullier), and extensive coastal plains.

- Andaman and Nicobar is **home to 10% of India's fauna** despite being just **0.25% of land mass**.
- The islands host **extensive mangrove ecosystems**, among the richest in India, which provide natural coastal defence against cyclones, storm surges, and tsunamis, as witnessed during the **2004 Indian Ocean tsunami.**
  - Along the coastline, **coral reefs** support high marine biodiversity and fisheries.
- **Anthropological Heritage (Living Paleolithic Museum):** The islands host one of the world's last uncontacted tribes, representing an invaluable **"Human Heritage Frontier"** that defines India's commitment to indigenous rights and protectionism, many of whom are classified as Particularly Vulnerable Tribal Groups (PVTGs) due to their small numbers, pre-agricultural livelihoods, and extreme isolation.
  - Tribes such as **Great Andamanese, Jarawa, Onge, Sentinelese, Nicobarese, and Shompen,** ranging from fully isolated hunter-gatherers to culturally distinct horticulturalists, embody diverse stages of human social evolution, making the islands a unique repository of irreplaceable cultural and anthropological knowledge.
- **Military Power Projection (The "Iron Wall" Defense):** The **Andaman and Nicobar Islands** serve as India's forward maritime bastion in the eastern Indian Ocean, enabling surveillance and deterrence near critical sea lanes.
  - The Andaman and Nicobar Command, **India's only tri-service theatre command**, integrates the Army, Navy, and Air Force for rapid, joint operations.
  - Naval and air bases such as **INS Utkrosh** and INS Baaz strengthen maritime domain awareness and power projection.
    - Together, these assets extend India's EEZ security, enable HADR operations, and anchor its Indo-Pacific strategy to realize the goal of SAGAR Vision.
- **Geo-Economic Game Changer (Trans-shipment Hub):** The islands are positioned to break India's dependency on foreign ports like Colombo and Singapore by establishing a deep-draft trans-shipment hub at Galathea Bay.
  - This shift will capture the massive revenue currently lost to foreign hubs and integrate India directly into the primary East-West shipping route, significantly lowering logistics costs for Indian exporters.
  - Currently, **75% of India's trans-shipped cargo is handled abroad,** costing huge forex.
    - The proposed Port will have ultimate **capacity to handle 16 million Containers per year** and in the **first phase will handle above 4 million Containers,** significantly saving India's forex.
- **Geo-Strategic Chokepoint:** ANI transforms India's defensive posture into an offensive advantage by **dominating the** Six Degree Channel and the approaches to the Strait of Malacca.
  - This proximity allows India to potentially interdict hostile naval movements or energy supplies during conflicts, **creating a credible "Malacca Dilemma" for adversaries like China** who rely heavily on this route for energy security.
    - The Malacca Strait **serves as the shortest maritime route** between the **Indian and Pacific Oceans**, facilitating the movement of an estimated 82,000 vessels annually.
    - Over 40% of global trade passes through this channel, including 80% of China's crude oil imports.
  - Also, ANI serves as a critical surveillance node, filling the **"blind spots" in the** Indian Ocean Region (IOR) against submarine and irregular warfare threats.
    - The islands facilitate a sensor chain that monitors Chinese research vessels and submarine movements to maintain a **"Free and Open Indo-Pacific.**

- For instance, the Coco Islands (Myanmar), suspected of **hosting Chinese SIGINT facilities**, are just 55 km north
- **Key to Strengthen India's Energy Security:** The vast maritime territory around **ANI holds untapped sedimentary basins** that serve as a strategic **"Energy Reserve"** for India's future hydrocarbon needs.
  - Exploiting these deep-water frontiers reduces import dependency and asserts sovereign rights over maritime resources, countering illegal exploration attempts by hostile actors in the Andaman Sea.
  - For instance, in September 2025, the **Union Petroleum Minister announced the discovery of natural gas in the Andaman basin** at the Sri Vijayapuram-2 well, **about 17 km off the Andaman coast,** confirming the region's hydrocarbon potential.

What are the Key Issues Associated with the Andaman Nicobar Islands?

- **Irreversible Ecological Decimation:** Large-scale infrastructure projects, specifically the **Great Nicobar Island (GNI) Project**, threaten to raze ancient rainforests and destroy critical marine nesting grounds for endangered species.
  - Critics argue that **"compensatory afforestation"** in mainland states cannot replicate the complex biodiversity of a **UNESCO Biosphere Reserve.**
  - For example, official estimates suggest felling **8.5 to 10 lakh trees**, though ecologists warn the actual toll could reach **10 million**. Also, the project could release **huge amounts of CO_2**.
    - Also, the project **threatens Galathea Bay**, the prime nesting site for Giant Leatherback Turtles.
- **Existential Threats to Indigenous Sovereignty:** Developmental encroachment on tribal reserves jeopardizes the **survival of Particularly Vulnerable Tribal Groups (PVTGs)** like the **Shompen** and **Jarawa** through forced contact and habitat loss.
  - Projects often bypass the **Forest Rights Act (2006),** failing to secure **"Free, Prior, and Informed Consent**" from the very communities whose 10,000-year-old heritage is at stake.
  - For instance, The Tribal Council of Little and Great Nicobar accuses the administration of **falsely claiming tribal rights settlement for a mega project**.
- **Strategic Militarization vs. Diplomatic Friction:** The push to transform the islands into an **"unsinkable aircraft carrier"** to counter China's maritime expansion risks escalating regional tensions with Southeast Asian neighbors.
  - While fortifying the **Andaman and Nicobar Command (ANC)** secures the **Malacca Strait chokepoint**, it fuels **"grey-zone" competition** and potential naval blockades that could unsettle the Indo-Pacific balance.
- **Extreme Geological and Climate Vulnerability:** The archipelago sits in **Seismic Zone V**, making it highly susceptible to catastrophic earthquakes and tsunamis that threaten the viability of multi-billion dollar concrete infrastructure.
  - Rising sea levels in the Bay of Bengal, currently **30% higher than the global average**, further risk submerging low-lying islands and destroying natural barriers like mangroves.
    - The 2004 Tsunami caused **permanent land subsidence of 15 feet at Indira Point.**
- **Maritime "Gray Zone" (Poaching & Infiltration):** The vast, unmanned coastline creates a "Porous Frontier" vulnerable to illegal unreported and unregulated (IUU) fishing and infiltration by non-state actors like Rohingya refugees.
  - This forces the Indian Coast Guard to **divert high-value assets for low-level policing, stretching the security grid thin** and allowing foreign actors to map hydrographic data under the guise of fishing.
  - For instance, in December 2025, **8 Myanmarese poachers were arrested** in the North and Middle Andaman district during **"Operation Coral Shield," seizing 800 kg of sea cucumber.**
- **Logistical Fragility and Food Insecurity:** The islands suffer from a debilitating dependence on the **mainland essential commodities,** making the supply chain vulnerable to maritime disruptions and seasonal weather.

- This **"distance penalty"** results in hyper-inflated costs of living and a lack of nutritional security as local agricultural productivity remains stifled by limited arable land and high salinity.
- **High transportation and logistics costs significantly inflate the price of basic goods** because agricultural production is limited by small cultivable land and challenging terrain, leading to **reliance on imported food supplies from the mainland**.

- **Digital Connectivity Deficits and Digital Exclusion:** Despite the commissioning of undersea cables, the archipelago still faces **unreliable internet bandwidth and "digital shadows" in remote islands**, hampering governance and the digital economy.
  - Inadequate air and sea inter-island connectivity limits the economic spillover from Port Blair to the southern groups, leaving peripheral communities isolated from healthcare and emergency services.
  - For example, the **Cani (Chennai-Andaman & Nicobar Islands)** cable provides **2 x 200 Gbps** to Port Blair, but remote islands still experience **lower speeds**; intra-island ferry delays average **12–24 hours** during monsoon.
- **Severe Freshwater Scarcity and Hydro-Stress:** The islands suffer from an acute freshwater deficit, and the planned explosion in tourism and military personnel ignores the limited aquifer recharge rates, creating a dangerous "**Resource Trap**."
  - For instance, despite receiving heavy tropical rainfall, the islands **lack the geological strata for groundwater retention** and the **infrastructure for large-scale harvesting**, leading to acute water rationing during summer.
    - The **over-reliance on surface runoff and small reservoirs** means that even a minor delay in the monsoon can trigger a humanitarian crisis for the burgeoning urban population.
  - For instance, Port Blair regularly experiences **intermittent piped water supply during peak dry months**.
- **Biological Invasion Threat:** The introduction of non-native species has triggered an **"Ecological override,"** where invasive flora and fauna outcompete endemic lineages, degrading the forest systems required for the island's climate resilience.
  - This **"Bio-security" failure** weakens the natural ecosystem services, such as soil retention and water filtration, which are critical for supporting the proposed mega-infrastructure projects.
  - For instance, **Chital (Spotted Deer), introduced in the 1930s**, have **no natural predators and prevent forest regeneration by overgrazing. Marine invasive species from ship ballast water threaten the coral reefs** that protect the islands from storm surges.
- **Rising Social Health Crisis:** The islands are currently grappling with a severe **"Silent Epidemic"** where geographical isolation, limited economic opportunities beyond government jobs, and high rates of alcoholism have created a **"pressure cooker" society.**
  - This social fragility **poses a direct threat to the workforce stability** needed for proposed mega-projects, as the local population faces a mental health crisis with critically insufficient psychiatric infrastructure to handle the trauma.
  - For instance, NCRB 2023 data ranks **Andaman and Nicobar Islands as having the highest suicide rate in India at 49.6 per 1,00,000 population**.
    - South Andaman district is the most vulnerable, with a suicide rate of **51.09, four times above the national average**.

What Principles Should Guide the Future Development of the Andaman & Nicobar Islands?

- **Strategic Sufficiency, Not Over-Militarisation:** Development in sensitive regions must enhance **maritime domain awareness and coastal surveillance** without triggering ecologically damaging over-infrastructure.
  - Priority should be given to **dual-use assets**, such as **coastal radar chains, satellite-linked AIS**

systems, upgraded civilian ports with naval access, and disaster-response vessels.
  - This approach strengthens security while avoiding excessive bases, dredging, or construction that could damage fragile coastal and island ecosystems.

- **Maintaining Ecological Primacy of Andaman:** Island-specific **carrying-capacity limits**, on freshwater (often **<50 million litres/day**), waste assimilation, and coastal load, **must guide land-use zoning and project size.**
  - Climate resilience and the **precautionary principle** are critical, as coral, mangrove, and rainforest loss here can permanently reduce coastal protection and food security.
  - Hence, growth pathways must be **low-footprint, phased, and ecologically bounded.**
- **Enhancing Tribal Protection:** Development must uphold the **autonomy and informed consent** of indigenous communities, especially PVTGs, many of whom number **fewer than 500 individuals**, making cultural loss irreversible.
  - Constitutional safeguards under **Articles 244 and 342**, the **Andaman & Nicobar Islands (Protection of Aboriginal Tribes) Regulation, 1956**, and the **Forest Rights Act, 2006** must be applied in letter and spirit, not bypassed for strategic or economic expediency.
  - Displacement or forced integration risks disease exposure, livelihood collapse, and erosion of traditional ecological knowledge that sustains **over 80% of intact forest ecosystems**. Hence, tribal survival is inseparable from human rights, biodiversity conservation, and long-term island resilience.
- **Promote Island-Specific Governance:**
  - Policy frameworks must move beyond mainland templates and reflect island constraints of **limited land, water (<50–60 MLD), high logistics costs, and disaster risk**.
  - Strengthening local councils, devolving **planning and budgetary powers**, and improving inter-island connectivity are critical to address **25–40% staffing gaps** and slow service delivery.
  - For instance, Maldives uses **atoll-level decentralised planning** linked to carrying capacity, while Seychelles integrates **marine spatial planning** with local governance.
    - Adapting such models can **enable responsive, participatory, and ecologically** grounded governance in Indian island territories.
- **Towards Sustainable Economic Diversification:** Economic diversification should prioritise **low-impact, high-value models** in tourism, fisheries, and the blue economy rather than volume-led growth.
  - Evidence from island economies shows that **eco-tourism with bed-density caps (<50 beds/sq km)** and community ownership generates **2–3 times higher local income retention** than mass tourism.
  - Sustainable fisheries, through **no-take marine zones covering 20–30% of reefs** and value-added processing, can raise fisher incomes by **25–40%** without stock depletion.
    - Hence, project appraisal must adopt **long-term cost–benefit horizons (30–40 years)** that internalise ecological loss, disaster risk, and social displacement.
- **Placing Social Well-Being at the Heart of Andaman's Development:** Beyond physical infrastructure, development must prioritise **mental health, healthcare access, education, and livelihoods**, especially in most isolated islands.
  - Limited specialist care and long referral times to the mainland exacerbate stress and untreated illness. **Suicide rates in some island districts** are reported to be **nearly four times the national average**, signalling deep social and psychological vulnerabilities.
  - Therefore, social cohesion, community support systems, and well-being outcomes must be treated as **core development indicators**, not peripheral welfare concerns.

Conclusion:

The Andaman and Nicobar Islands **represent a rare convergence of strategic geography, ecological richness, and cultural antiquity. Sustainable progress in the islands lies in harmonising India's maritime and security ambitions with ecological stewardship**, constitutional protection of indigenous communities, and human-centric governance. Only by **treating the islands not merely as a strategic asset but as a living socio-ecological system** can India **ensure resilient, ethical, and long-term development in the eastern Indian Ocean.**

The India–UAE Strategic Arc

This editorial is based on "India, UAE deepen ties with mega defence plan, LNG deal" which was published in The Hindu on 20/01/2026. This article analyses the evolution of India–UAE relations from civilizational trade ties to a comprehensive strategic partnership, highlighting achievements, challenges, and the roadmap ahead in a shifting global order.

India–UAE relations have matured into a premier strategic partnership, with bilateral trade crossing $100 billion in FY 2024–25 under the INDIA-UAE CEPA and a **new target of $200** billion by 2032. The UAE has emerged as **India's third-largest trading partner** and a key **source of FDI**, while cooperation has moved beyond oil through a 10-year LNG pact and new domains such as **fintech (UPI–AANI & RuPay-JAYWAN)** , the India–Middle East–Europe Economic Corridor (IMEC) and recent talks on a **Strategic Defence Partnership**, including defence industrial collaboration and interoperability. Anchored in a **3.5 million–strong Indian diaspora,** this partnership transforms economic interdependence into **sustained geopolitical convergence.**

How India- UAE Relations Have Evolved Over Time ?

- **Phase I: The Mercantile & Cultural Era (Pre-1971):** This phase was shaped by **geography-driven ties rather than formal diplomacy,** with the Arabian Sea enabling a borderless maritime economy.
  - India was the economic anchor, and the **Indian Rupee functioned as the de facto currency in the Trucial States until 1966.**
  - Cultural links were sustained through the **dhow trade** (an ancient maritime network that has connected the **Arabian Peninsula, East Africa, and South Asia for over 2,000 years**), where **Indian merchants were integral to Gulf society, not expatriates.**
  - This phase shows that India–UAE relations are civilizational and predate the oil boom, making today's partnership a return to historical continuity.
    - **The 1966 devaluation of the Indian Rupee** marked the **first major economic decoupling**, pushing Gulf states towards independent currencies and sovereignty.
- **Phase II: The "Transaction" Era (1971–2000)** : This phase saw India–UAE ties turn **purely transactional after the UAE's formation,** centred on **oil exports and Indian migrant labour.**
  - Geopolitically, Cold War alignments created distance, as the **UAE leaned towards the US–Saudi bloc and viewed India through the Pakistan lens** due to India's proximity to the USSR.
  - Security relations hit a low point, with **Dubai emerging as a hub for smuggling and anti-India elements,** deepening mistrust in New Delhi.
  - **Though, Indian workers fuelled the UAE's growth** during the **"Gulf Dream"** but were seen only as economic inputs, not as sources of soft power.
  - This phase **reflected strategic myopia,** exemplified by the **UAE's support to Pakistan on Kashmir** at forums like the Organization of Islamic Cooperation.
- **Phase III: The Economic Awakening & "Benign Neglect" (2000–2014):** This was marked by **booming trade but stagnant political engagement** between India and the UAE.
  - Politically, **a paradox of "high trade, low politics" prevailed,** with strong commercial ties but minimal high-level diplomatic outreach.
  - **Energy relations remained transactional**, locked in a **simple buyer–seller model without strategic depth** such as joint reserves or downstream investments.
  - The 2002 deportation of **Aftab Ansari** signalled a quiet shift, **marking the UAE's break from being a terror safe haven** and the **beginning of covert security cooperation with India.**
- **Phase IV: The Strategic Realignment & "Golden Era" (2015–Present):** This marks a decisive shift from transactional ties to a **Comprehensive Strategic Partnership driven by shared realist interests in a post-American Middle East**.
  - The **2015 UAE visit of the Prime Minister broke a 34-year gap, condemned state-sponsored terrorism,** and repositioned the UAE as India's global connectivity hub through **IMEC** and I2U2.
  - Geopolitically, the UAE **de-hyphenated India from Pakistan,** evident in inviting **India as Guest of Honour** to the **Organization of Islamic Cooperation** in 2019 despite Pakistan's boycott.
  - The **Comprehensive Economic Partnership Agreement (CEPA) was signed in 2022 in record time (88 days of negotiation**)
  - In January 2026, the two nations signed a Letter of Intent for a formal Strategic Defence Partnership.

What are the Current Areas of Development in the India-UAE Relations ?

- **Enhanced Economic Partnership:** The bilateral economic strategy has shifted from mere commodity exchange to a deep institutional integration designed to shield both economies from global volatility**, credited to the Comprehensive Economic Partnership Agreement (CEPA).**

- In January 2026, both nations **set a target of $200 billion in annual trade by 2032,** building on the $100 billion milestone reached in FY 2024-25.
  - By doubling the trade target, both nations are signaling a **commitment to creating a corridor in the Global South** that bypasses traditional Western trade dependencies.
- Initiatives like **'Bharat Mart'** in **Jebel Ali Free Zone (JAFZA)**and the **'Bharat-Africa Setu'** are being fast-tracked to **integrate Indian MSMEs into the UAE's global re-export network.**

- **The Strategic Defense Pivot:** India and the UAE are moving toward a formal security architecture, reflecting a shared vision of strategic autonomy and a collective stance against cross-border terrorism.
  - This shift indicates that the **UAE now views India, rather than traditional regional allies, as its primary partner for maritime security** and defense industrial innovation in the Indian Ocean.
  - **For instance,** a **Letter of Intent (LoI) for a Strategic Defence Partnership** was signed in January 2026, covering **defense industrial collaboration and interoperability**.
    - Joint exercises like **Desert Cyclone and Desert Flag** now feature complex combat scenarios **involving multi-domain operations, real-time interoperability,** and high-intensity air-land coordination, reflecting a shift from symbolic drills to realistic war-fighting preparedness.
- **From Crude Trade to Clean Energy Partnership:** The energy relationship has transcended the "transactional crude" phase to embrace long-term energy security and the **"SHANTI" (Sustainable Harnessing and Advancement of Nuclear Energy) framework**.
  - By venturing into **civil nuclear cooperation and Small Modular Reactors (SMRs),** the **UAE is positioning itself as a primary financier** and partner in India's green energy transition.
  - **For example,** HPCL signed a **10-year LNG supply pact** with ADNOC in 2026 for **0.5 million metric tonnes** annually starting in 2028.
    - Simultaneously, both nations are collaborating on Small Modular Reactors (SMRs) to capitalize on India's new nuclear policies and the **UAE's Barakah nuclear expertise**.
  - Complementing this shift, India and the UAE are aligning their climate strategies to co-develop a **Green Hydrogen value chain,** combining India's manufacturing scale with the UAE's capital to build a sustainable "Green Corridor" for the Global South.
- **Fintech & Digital Alliance:** Financial and digital connectivity has become the **"new oil,"** with both nations aiming to create a sovereign digital payment corridor that challenges the hegemony of Western financial systems.
  - The **establishment of "Digital Embassies"** and **supercomputing clusters** highlights a transition toward high-end technological interdependence.
  - The integration of India's **RuPay card with UAE's JAYWAN** card stack has revolutionized remittances for the **3.5 million-strong diaspora**.
  - Furthermore, both sides have now agreed in principle to establish a supercomputing cluster in India through collaboration between **C-DAC(India) and G42(UAE)**.
    - Integrated with the **AI India Mission,** the facility will support public and private research, application development and commercial innovation.
- **Infrastructure Cooperation-The "Greenfield" Asset Shift":** The investment strategy has matured from passive portfolio holdings to active **"greenfield asset creation,"** where UAE sovereign funds are now anchor investors in **India's industrial backbone**.
  - This shift aims to physically integrate **Indian manufacturing zones** (like Gujarat) with the Jebel Ali transshipment hub, **effectively operationalizing the IMEC corridor** by owning the logistics chain end-to-end to bypass global chokepoints.

- For instance, the UAE committed to **developing the Dholera Special Investment Region (Gujarat),** including a new international airport and greenfield port. Simultaneously, **DP World pledged an additional $5 billion to upgrade India's port logistics network.**
- **Space Cooperation-From "Launch Client" to "Co-Developer":** Space cooperation has graduated from a transactional "buyer-seller" model (UAE paying for launches) to a "**co-development"** partnership focused on capturing the global commercial payload market.
  - The two nations are combining ISRO's cost-effective engineering with UAE capital **to build a shared industrial base**, moving beyond state-level science missions to private-sector integration and human spaceflight training.
  - For instance, in January 2026, IN-SPACe and the UAE Space Agency signed a **landmark Letter of Intent (LoI) to jointly develop Commercial Launch facilities**.
- **The "Knowledge Corridor" & Skill Mobility:** The relationship has shifted from a **"labor-export" model to a high-end "knowledge partnership,"** aiming to create a seamless ecosystem for academic excellence and professional certification.
  - This transition ensures that the Indian diaspora in the UAE is **no longer just a workforce but a primary driver of the UAE's transition** into a post-oil, innovation-led economy.
  - **For Example,** following the 2024 opening of **IIT Delhi-Abu Dhabi**, the campus is set to double its student strength to **400 by late 2026** while introducing specialized Master's programs in AI.
    - This is supported by the 2025 MoU on **Mutual Recognition of Qualifications**, facilitating the mobility of professionals across the **3.5 million-strong** Indian community.
- **Cultural & Sports Diplomacy:** The relationship has evolved beyond transactional diplomacy into a civilizational partnership, with the UAE emerging **as a cultural extension of India.** This approach follows a dual strategy: **affirming the Indian diaspora's long-term belonging** through unprecedented religious and cultural recognition, moving past the notion of a "temporary workforce", while also **providing a neutral and trusted platform for managing sensitive regional engagements** between India and Pakistan.
  - For instance, **The BAPS Hindu Mandir**, inaugurated in February 2024, **built on 27 acres of land gifted by the UAE President**. At the same time, the UAE has positioned itself as a consistent neutral venue for sensitive India–Pakistan sporting interactions.

What are the Key Areas of Friction in the India-UAE Relationship?

- **Structural Trade Imbalance & CEPA Utilization Gaps:** Despite the Comprehensive Economic Partnership Agreement (CEPA) operationalizing zero-duty access, **India faces a persistent challenge in diversifying exports beyond low-value-added sectors** like **gems and jewelry to offset the heavy energy import bill**.
  - The structural asymmetry forces India to **constantly negotiate non-tariff barriers and rules of origin to prevent the "pass-through" of third-party goods,** while the UAE's trade surplus complicates the full adoption of local currency settlement mechanisms.
  - **For example,** in FY2025, while bilateral trade crossed **$100 billion**, India's trade deficit remained nearly **$26 billion** primarily due to oil imports.
    - Also, **India fears the UAE is becoming a conduit for third-party goods (like gold/silver)** bypassing duties, forcing India to tighten scrutiny which frictionizes trade.
- **Geopolitical Vulnerability of the IMEC Corridor:** The **stalling of the India-Middle East-Europe Economic Corridor (IMEC)** exposes the fragility of India's regional connectivity strategy to West Asian volatility, specifically the Israel-Gaza conflict, which has **frozen the physical integration of the UAE-Israel leg.**
  - This creates a strategic bottleneck where **India's "gateway to Europe" is held hostage by**

regional insecurity, forcing New Delhi to rely on longer, costlier maritime routes **while simultaneously managing diplomatic tightropes with Iran and the Arab world**.

- **The "Hydrocarbon-Renewable" Energy Paradox:** India faces the dual pressure of securing immediate fossil fuel supplies to power its growing economy **while simultaneously partnering with the UAE on green hydrogen**, creating a policy friction where long-term decarbonization goals compete with short-term energy security needs.
  - The **relationship is locked in a transition phase** where India must deepen dependence on UAE's oil and LNG infrastructure even as it seeks to compete with the UAE as a global green hydrogen export hub.
  - **For instance,** Indian entities signed a **10-year LNG supply agreement** (1.2 MMTPA) with ADNOC, **cementing fossil reliance even as both nations chase** conflicting **Net Zero 2070/2050** targets.
- **Financial Interoperability & Rupee Accumulation Risks:** The **Local Currency Settlement System (LCSS)** faces a liquidity hurdle where UAE exporters accumulate Indian Rupees (INR) from their trade surplus but lack sufficient avenues to reinvest them in India's bond or equity markets at scale.
  - This **"trapped liquidity"** creates **hesitation among UAE banks** to fully **abandon the Dollar peg**, limiting the mechanism's efficacy to symbolic transactions rather than becoming a mainstream trade settlement standard.
- **Labor Market Nationalization vs. Diaspora Dependence:** The UAE's aggressive **Emiratisation** drive poses a structural risk to the **3.5 million-strong Indian workforce,** especially in white-collar sectors that sustain **India's billions of annual remittance inflow.**
  - Large firms were mandated to achieve **8% Emiratisation by the end of 2025, non-compliance now triggers annual financial penalties,** which indirectly penalise the Indian workforce by constraining hiring flexibility and increasing preference for national employment
  - While blue-collar employment remains relatively insulated, shrinking professional opportunities **signal long-term stress on India's remittance-led forex buffer.**
- **The "Paper-to-Project" Investment Latency:** A recurring friction is the **execution gap** between the **UAE's massive sovereign pledges (ADIA/Mubadala)** and the slow pace of actual capital deployment, **often bottled-necked by India's retrospective tax fears and lengthy dispute resolution mechanisms** that deter long-term infrastructure bets compared to faster Western markets.
  - Out of the pledged **$75 billion** investment target, **realized FDI stands** at only **around $22 billion** (as of March 2025) and the **recent talks over Bilateral Investment Treaty** review specifically focused on bypassing the **"exhaustion of local remedies"** clause to accelerate the remaining capital flow.
  - For instance, the **Ratnagiri Refinery** remains stalled due to land disputes despite ADNOC's committed capital.
- **Defense Strategic Divergence- Kinetic vs. Diplomatic Posture:** While maritime cooperation is growing, **a strategic disconnect exists between India's direct naval assertiveness in the Red Sea and the UAE's preference for cautious, non-aligned diplomacy** to manage regional proxies, **limiting the scope of joint kinetic operations** despite shared threats to critical shipping lanes.
  - For instance, in the recent talks defense outcomes were limited to **defense industrial manufacturing (drones/AI) rather than joint patrols.**
    - India's **40-warship deployment** in the Red Sea continues to operate independently of UAE naval assets, revealing a "coordination without integration" reality.
- **The "China Factor" & Strategic Hedging:** The UAE's deepening technological and military embrace of China (Huawei 5G, port infrastructure) creates a sharp Security Dilemma for India. This **complicates the I2U2 framework and sensitive technology transfers**.

- For instance, **a number of Chinese companies** have also invested in manufacturing and trading entities **within Khalifa Economic Zones Abu Dhabi Group**.

What Measures Can be Taken to Strengthen the India-UAE Relationship ?

- **Institutionalize a "Sovereign Fast-Track" Arbitration Mechanism:** To resolve the "investment latency" issue, India should establish a bespoke dispute resolution corridor within **GIFT City** specifically for UAE sovereign wealth funds (ADIA, Mubadala).
  - This would operationalize the spirit of the **Bilateral Investment Treaty** by bypassing India's prolonged lower-judiciary delays, thereby converting hesitant capital into active, long-term "greenfield" infrastructure assets.
- **Create a "Rupee-Dirham Corporate Bond" Market**: To solve the **LCSS liquidity trap**, policy regulators should facilitate the listing of high-yield **Indian "Masala Bonds" or green infrastructure bonds in the Abu Dhabi Global Market (ADGM).**
  - This financial innovation would allow UAE banks to reinvest their surplus accumulated Rupees into profit-generating Indian assets rather than converting them back to Dollars, transforming the **Local Currency Settlement System** from a symbolic trade tool into a robust, circular investment vehicle.
- **Operationalize a "Strategic Food Security Treaty" with Ban-Exemptions:** India must move beyond general assurances and sign a binding treaty that grants the UAE specific, **quota-based exemptions** from ad-hoc agricultural export bans (rice/wheat/sugar).
  - In exchange for this **"supply chain immunity,"** the UAE would be contractually bound to fully capitalize the stalled **I2U2 Food Parks**, creating a closed-loop **"farm-to-port"** corridor that guarantees price stability for Indian farmers and food sovereignty for the Emirates.
- **Accelerate Transition to a "Co-Production" Defense Industrial Base:** The defense partnership needs to pivot from "buyer-seller" dynamics to a **"Joint Intellectual Property"** model, specifically targeting drone warfare, AI-surveillance, and desert-warfare electronics.
  - By merging India's frugal engineering and software prowess with the UAE's advanced component procurement networks, both nations can build a **"Shared Strategic Autonomy"** that **reduces dependence on Western or Chinese OEMs for critical security needs in the Indian Ocean Region.**
- **Establish a "Transnational Skill Harmonization" Protocol:** To counter the risks of **Emiratisation**, India should co-create a **"Skills Passport"** system where Indian vocational certifications are pre-validated by the **UAE National Qualifications Authority**.
  - This measure would proactively upskill the Indian blue-collar workforce into **"grey-collar"** technicians **(automation, HVAC, clean energy),** ensuring they remain indispensable to the UAE's post-oil **"Knowledge Economy"** while securing higher-value remittances for the Indian economy.
- **Construct a "Green Maritime Bridge" :** Given the geopolitical stalling of the rail network, India and UAE should aggressively digitize and decarbonize the direct sea leg between **JNPT/Mundra** and **Jebel Ali**.
  - Implementing a "**Green Corridor**" with **e-Bills of Lading, harmonized customs integration, and preferential docking for green-fuel vessels** will slash logistics costs and secure the bilateral trade route, ensuring connectivity thrives even if the broader **IMEC regional integration** remains frozen by West Asian instability.
- **Interlink Digital Public Infrastructure (DPI) Beyond Payments:** Moving beyond the **UPI-AANI** linkage, the two nations should integrate their broader digital stacks to create a **"Cross-Border Digital Commons."**
  - This involves the mutual recognition of digital health records, portable credit histories for SMEs, and verified educational credentials, drastically reducing the compliance friction for

the **Indian diaspora** and enabling seamless, paperless mobility for businesses operating in the **Dubai-Mumbai corridor**.

- **Develop a "Green Hydrogen Grid" Partnership:** To address the energy transition paradox, the partnership should evolve into a **"Virtual Power Plant"** model where India produces green hydrogen using its low-cost renewable geography, and the UAE invests in the **cryogenic shipping infrastructure**.
  - This **decouples the relationship from pure hydrocarbon dependency** and positions the India-UAE axis as a primary **"Green Energy Exporter"** to Europe, leveraging the UAE's logistics dominance to market India's clean energy production.

Conclusion:

India–UAE relations have **transcended transactional pragmatism to emerge as a model strategic partnership** anchored in trust, technology, and shared geopolitical realism. As both nations navigate a volatile West Asian order, their convergence on connectivity, clean energy, and digital public infrastructure reflects a shift from dependence to co-creation. **The real test ahead lies in converting visionary frameworks into executable projects that deliver mutual strategic autonomy**. If sustained, this partnership **can redefine South–West Asia integration and serve as a template for resilient cooperation in a multipolar world.**

India'S Transition Towards Natural Farming

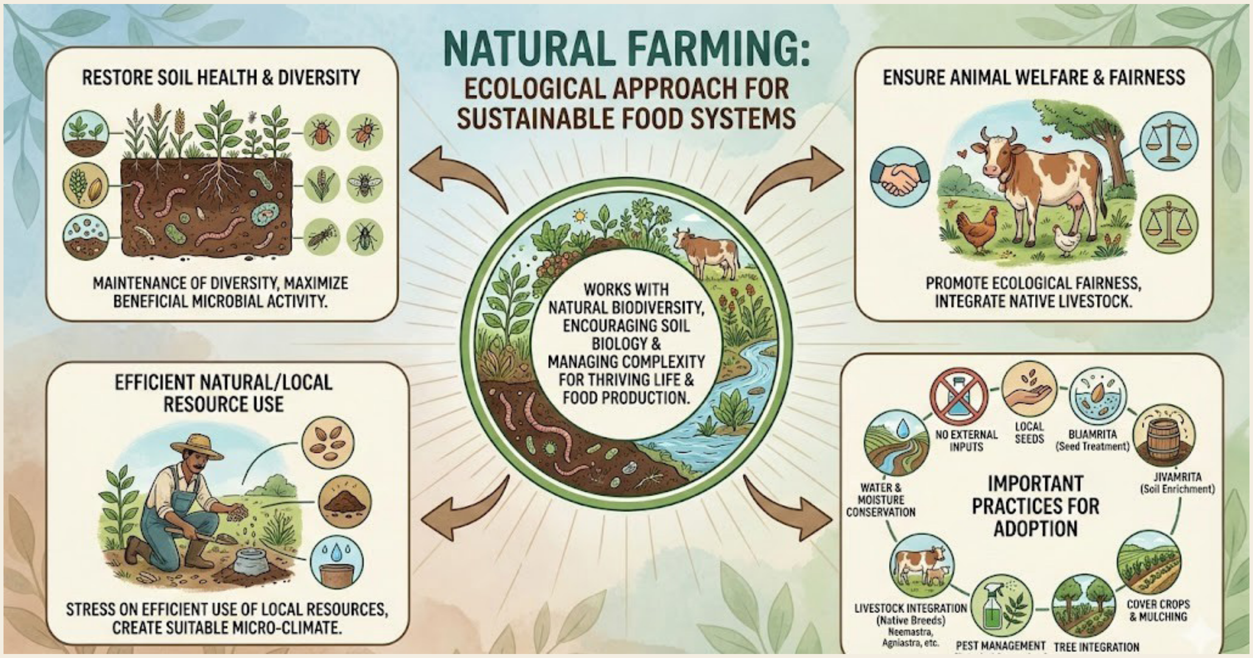
This editorial is based on "Designing the transition to natural farming" which was published in The Hindu business line on 20/01/2026. This editorial examines India's transition towards natural farming as a response to rising input costs, soil degradation, and climate stress. It analyses policy initiatives, structural challenges, and reform pathways needed to make natural farming economically viable and scalable.

Amid **rising input costs, climate volatility, and agrarian distress**, a quiet shift is underway in India's fields. From Andhra Pradesh to Uttar Pradesh, f**armers experimenting with natural farming are challenging the chemical-intensive growth model** that powered the Green Revolution. This transition reflects not nostalgia, but a **pragmatic search for ecological resilience, soil sovereignty, and income stability**. The debate is no longer whether agriculture must change, but how urgently and at what scale.

What is Natural Farming?

- **About:** Natural Farming (NF) is a **chemical-free, low-intervention agricultural system** that works with nature's processes, minimizing human labor by avoiding synthetic inputs, tillage, and weeding, and instead fostering biodiversity, soil health, and on-farm resource utilization (like cow dung/urine for bio-inputs) to create self-sustaining, ecological farm ecosystems
  - NF recognises the interdependence of the natural ecosystem amongst soil, water, microbiome, plants, animals, climate and human requirements.
  - Its most famous proponent, the Japanese farmer **Masanobu Fukuoka** (author of **The One-Straw Revolution**), established **these four principles:**
    - **No Tillage:** The soil is not plowed or turned. This preserves soil structure and protects microorganisms.
    - **No Chemical Fertilizers:** Nutrients are provided by nature (microbes, earthworms, and organic matter), not synthetic chemicals.
    - **No Weeding by Tillage/Herbicides:** Weeds are controlled by natural suppression (mulching) rather than elimination, as they play a role in soil balance.
    - **No Chemical Pesticides:** Pests are managed by ecological balance and natural predators, not poisons
- **Natural Farming in India- "Zero Budget Natural Farming" (ZBNF):**In India, Natural Farming is popularly practiced as **Zero Budget Natural Farming (ZBNF)**, promoted by Subhash Palekar. It is now often supported under government initiatives like the **National Mission on Natural Farming (NMNF)**.

- The term **"Zero Budget"** implies that the cost of production is near zero because farmers do not need to buy expensive inputs like fertilizers or pesticides.



- **Components of Natural Farming**
  - **Seed Treatment (Beejamrut):** Use of locally adapted indigenous seeds and on-farm seed treatment with natural formulations such as ***Beejamrut*** to enhance seed vigour and protect against soil-borne diseases.
  - **Soil Health Management (Ghan Jeevamrut):** Application of farm-made inputs like ***Ghan Jeevamrut*** to improve microbial activity, nutrient availability, and long-term soil fertility.
  - **Round-the-Year Soil Cover (Acchadana- Mulching):** Maintaining continuous soil cover through live crops or crop residues to conserve moisture, regulate temperature, suppress weeds, and prevent erosion.
  - **Soil Microclimate Management (Waaphasa – Soil Aeration):** Minimising soil disturbance to enhance natural porosity, ensuring optimal air–water balance for better root growth, moisture retention, and crop resilience.
  - **Plant Health Management:** Use of **bio-inputs and need-based natural formulations** to strengthen plant immunity, reduce pest incidence, and lower dependence on external chemical inputs.
  - **Resource Efficiency and Income Enhancement:** Holistic adoption of natural farming principles to reduce input costs, improve soil health, and enhance net farm income in a sustainable manner.

What Compels India to Shift Towards Natural Farming?

- **Economic Sustainability and Farmer Income Security:** Indian agriculture is trapped in a **high-cost, low-return cycle** driven by **external inputs such as chemical fertilizers, pesticides, and proprietary seeds.**
  - For instance, on an average, to cultivate rice, **farmers spent INR 5,961 per acre on chemical inputs** while farmers who were practicing complete Zero Budget Natural Farming spent **INR 846 per acre on natural inputs.**
  - Small and marginal farmers who form the majority (over 85% of the farmers in India),are **disproportionately affected by rising input prices and climate shocks**. Natural farming **lowers entry barriers by reducing dependence on market-purchased inputs and credit**.

- **Soil Health and Long-Term Productivity:** An **ICAR study**, based on **analysis of 2.54 lakh soil samples** from 620 districts across 29 States, indicates that **unscientific fertilizer use and climate change are eroding organic carbon levels in India's arable soils**.
  - Natural farming **restores soil biology through organic carbon enrichment** and microbial activation, **improving nutrient cycling and soil structure**.
- **Water Conservation and Climate Resilience:** Conventional agriculture is **highly water-intensive and vulnerable to erratic monsoons and rising temperatures**.
  - And, already around **600 million people in India** experience **high to extreme water stress**.
  - Natural farming practices **such as mulching and improved soil aeration reduce evaporation losses and enhance moisture retention.**
  - This **lowers irrigation demand while improving crop tolerance to droughts** and heat stress.
    - As climate risks intensify, **such agro-ecological resilience becomes a necessity rather than a choice.**
- **Environmental Protection and Biodiversity Revival:** Chemical **runoff pollutes groundwater, degrades ecosystems, and disrupts beneficial insect populations**.
  - Natural farming minimises synthetic chemical use, allowing natural predators, pollinators, and soil fauna to recover.
  - This **restores ecological balance and reduces long-term pest pressures.** Environmentally, the shift helps internalise ecological costs previously externalised by chemical agriculture.
- **Human Health and Food Safety:** Farmers are directly exposed to hazardous agrochemicals, while consumers face risks from pesticide residues in food and water.
  - **Natural farming reduces chemical exposure across the food chain, lowering occupational health risks and public health burdens**.
  - Cleaner food systems **also align with rising consumer demand (particularly in the EU's market) for safe and nutritious produce**.
- **Institutional and Fiscal Rationality:** India's fertiliser and pesticide subsidies **impose a heavy fiscal burden while encouraging inefficient input use (eg, Fertiliser subsidy is second highest after food)**.
  - Promoting natural farming can gradually rationalise subsidy expenditure by **shifting support from chemicals to knowledge, training, and ecosystem services**.
  - This **improves public spending efficiency without compromising food security.** Over time, it aligns agricultural policy with ecological and fiscal sustainability.
- **Alignment with Sustainable Development and Future Food Systems:** India must **balance food security with environmental limits** in a climate-constrained future.
  - Natural farming **contributes to sustainable agriculture, climate action**, and **land restoration goals** without requiring high capital intensity.
  - It represents a **transition towards regenerative food systems** rather than extractive production models. Strategically, it is central to building a future-ready agricultural economy.

What Current Measures India has Undertaken to Promote Natural Farming ?

- **Institutional Mission Mode: National Mission on Natural Farming (NMNF):** This "**Mission Mode**" priority, **effectively institutionalizing the shift from chemical-intensive to chemical-free agriculture** by creating a **dedicated management structure that standardizes protocols and ensures direct funding flow to districts**.
  - Approved in late 2024 with a **₹2,481 crore outlay**, the mission targets **1 crore farmers** across **7.5 lakh hectares**, providing an incentive of **₹4,000 per acre/year** to buffer transition costs.
- **Fiscal Federalism & Subsidy Reform-PM-PRANAM Scheme:** The scheme incentivises states to reduce chemical fertiliser use by allowing them to retain **50% of the resulting subsidy savings** as central grants, with **70% earmarked for creating organic and bio-fertiliser infrastructure**.

- By converting subsidy savings into a fiscal reward, it embeds ecological outcomes within a **competitive federal framework**, encouraging states to promote natural farming and balanced nutrient use..
- **Supply Chain Infrastructure – Bio-Input Resource Centres (BRCs):**To overcome labour and time constraints in preparing bio-inputs like Jeevamrit, the government is promoting **BRCs as village-level micro-enterprises** that supply standardized, ready-to-use natural inputs.
  - This reduces farmer drudgery while creating **entrepreneurship opportunities for SHGs and rural youth**. The **2024–25 roadmap targets 10,000 BRCs** to serve **15,000 clusters**, ensuring reliable access to bio-inputs for **over 1 crore farmers**.
- **Eco-Geographical Corridor- Arth Ganga:** Under the Arth Ganga approach, a **chemical-free natural farming corridor** is being developed along the Ganges to curb agro-chemical runoff while linking river rejuvenation with sustainable agriculture.
  - By promoting a **"Ganga-branded" organic belt**, it leverages cultural value to secure premium markets for farmers. The initiative prioritises natural farming within a **10-km belt along the river banks**, integrating water conservation with livelihoods..
- **Certification & Market Trust – Digital Portal & Branding:**To address credibility and traceability gaps, the government has streamlined certification through the **Jaivik Kheti portal**, **PGS**, and PKVY , enabling smallholders to authenticate natural produce without costly third-party audits.
  - This digital, cluster-based model aggregates farmers into a unified marketplace, helping them bypass intermediaries and access premium buyers. The portal hosts **over 6 lakh farmers**, while **NMNF's "Single National Brand"** aims to standardize quality across **15,000 clusters**.
- **Educational Integration & Gender-Led Extension:**ICAR has integrated natural farming into **UG and PG curricula**, shifting it from traditional practice to **scientifically validated pedagogy** through research and field trials at **KVKs**, thereby strengthening extension capacity.
  - Complementing this, the Krishi Sakhi Convergence Program (KSCP) deploys trained women SHG members as para-extension workers, leveraging peer networks for behavioral change.
  - Linked with the **Lakhpati Didi initiative**, over **70,000 Krishi Sakhis (as of August 2025)** now ensure last-mile guidance, community ownership, and livelihood generation.

What are the Key Issues Associated with India's Transition Towards Natural Farming?

- **The "Yield Penalty" Transition Dip:** The most immediate economic barrier is the sharp **decline in crop yields during the initial years (although region specific)** conversion period as the soil microbiome rebuilds itself without synthetic boosters.
  - This "transition dip" creates a severe **liquidity crunch for smallholders who operate on thin margins and cannot afford even a single season of reduced output,** leading to high dropout rates before soil fertility stabilizes.
- **Labour Intensity & Input Drudgery:** Natural farming methods including the preparation of bio-inputs like **jeevamrit and manual weed control** are **more labour-intensive than conventional input-based systems**.
  - Such practices often require **greater reliance on manual labour**, especially **where mechanisation is limited**, which can pose a challenge for farmers in regions experiencing labour shortages and rising wage rates.
  - These act as a barrier to wider adoption, **particularly where farm households depend on off-farm income or struggle with time constraints.**
- **The "Indigenous Cattle" Constraint:** The core protocol of Natural Farming relies **heavily on dung and urine from indigenous (*Desi*) cows**, yet the mechanization of agriculture has drastically reduced

the male cattle population, making access to fresh inputs a logistical nightmare for non-dairy farmers.

- For instance, the 20th Livestock Census shows a **6% decline in total indigenous cattle**.
- This creates a dependency paradox where a "self-reliant" farming method forces landless or cattle-less farmers to buy bio-inputs, **reintroducing a cost structure they tried to escape.**

- **Asymmetric Fiscal Incentives:** There is a massive policy contradiction where the government **promotes natural farming with modest funds while simultaneously underwriting chemical farming with enormous subsidies**, effectively paying farmers to stay chemical-dependent.
  - In 2024–25, the chemical fertilizer subsidy bill stands at a colossal **₹1.64 lakh crore**, this heavily skewed financial ecosystem makes **cheap urea excessively accessible,** rendering natural farming economically unattractive despite its long-term ecological benefits.
- **Certification & Traceability Deficit:** The current market lacks a robust, scalable verification system for natural produce, forcing farmers **to sell premium chemical-free crops at ordinary mandi prices** because they cannot prove their "natural" status to distant urban consumers.
  - The reliance on **Participatory Guarantee Systems (PGS)** is socially inclusive but commercially weak, **as it lacks the brand trust of third-party certifications required by major retail chains and exporters.**
- **Scientific Validation Void:** A persistent friction exists between **traditional knowledge and formal agricultural science,** as the lack of rigorous, long-term peer-reviewed studies across diverse agro-climatic zones creates skepticism among extension officials and scientists.
  - Without a definitive **"package of practices"** (PoP) validated by universities for every crop-region combination, state agriculture departments remain hesitant to aggressively push natural farming as a mainline strategy.
- **Market Absorption & Price Risk Uncertainty:** Even when natural farming reduces input costs, farmers **remain exposed to volatile output markets** where prices are determined by conventional produce benchmarks.
  - In the **absence of assured procurement or differentiated pricing,** productivity-neutral or slightly lower yields translate into income risk rather than ecological gain.
  - This weak market signal discourages rational farmers from transitioning, as **economic survival today outweighs uncertain environmental dividends tomorrow,** especially in cereals and perishables where MSP or contract farming dominates price discovery.
- **Food Insecurity and Nutritional Vulnerability:** While Natural Farming promises long-term sustainability, cost reduction, and soil health restoration, its transition phase poses short-term risks that intersect critically with India's existing food and nutrition challenges.
  - According to the State of Food Security and Nutrition in the World 2025, **about 12% of India's population (around 172 million people) remain undernourished,** and **nearly 42.9% cannot afford a healthy diet** due to rising food costs, reflecting deep structural challenges in food access, affordability, and quality.
  - This persistent food insecurity **increases vulnerability for smallholder farmers transitioning to natural farming,** as even marginal yield dips or market uncertainties can **exacerbate households' ability to secure adequate nutrition and income.**

What Measures are Needed to Smoothen India's Transition Towards Natural Farming?

- **Institutionalize "Transition Insurance" for Yield Gaps:** To address the immediate productivity dip during the conversion phase, the state must design a **"Yield Deficit Underwriting"** mechanism that compensates farmers not just for crop failure, **but for the specific volume difference between conventional and natural output during the first three years.**

- This de-risking financial instrument **should be pegged to regional baseline yields rather than market prices**, ensuring that the farmer's **income volatility** is neutralized while the soil microbiome regenerates, effectively treating the transition period as a state-subsidized gestation phase for long-term ecological asset creation.

- **Decentralize Bio-Input Supply Chains via "Micro-Enterprises":** Instead of relying on farmer-level production alone, the ecosystem needs a network of professionalized **"Bio-Input Resource Centers" (BRCs)** operating as village-level micro-enterprises run by women collectives or rural youth.
  - This professionalization **ensures standardization of quality (controlling pH, bacterial count)** for inputs like *Jeevamrut* and *Beejamrut*, removing the labor burden from individual farmers and creating a reliable, **just-in-time supply chain** that mimics the convenience of chemical fertilizer shops but with localized, circular economy principles.
- **Create "Bio-Village Clusters" for Aggregated Market Leverage:** To solve the fragmentation issue, the transition strategy should focus on notifying contiguous **"Natural Farming Zones"** or **Bio-Villages** rather than isolated individual adoption.
  - This **spatial clustering allow**s for the **synchronization of planting schedules**, **prevention of chemical drift** from neighboring farms, and the creation of **economies of scale** for bulk procurement and logistics, enabling FPOs to negotiate with large retail chains using the collective bargaining power of a verified, chemical-free regional brand identity.
- **Digitize Trust with "Blockchain-Enabled Traceability"**: To bypass the expensive and slow third-party certification systems, the sector needs a **"Participatory Guarantee System (PGS) 2.0"** anchored on distributed ledger technology.
  - By allowing **consumers to scan a QR code** and **view the immutable history of farm inputs**, verified **peer-to-peer by local farmer groups**, the system replaces institutional bureaucracy with **"Digital Trust,"** significantly lowering compliance costs for smallholders while offering premium market assurance to urban consumers wary of **"greenwashing**."
- **Mandate "Green Procurement" in Public Distribution Systems (PDS):** The state can act as the **"Market-Maker of First Resort"** by mandating that a fixed percentage of produce for **Mid-Day Meals** and Anganwadis be sourced exclusively from local natural farming clusters.
  - This creates a **guaranteed, non-volatile demand** sink that insulates farmers from open market fluctuations during their vulnerable transition years, while simultaneously improving **nutritional security** for public beneficiaries, effectively closing the loop between public health goals and agricultural sustainability.
- **Re-engineer Extension Services into "Farmer-Scientist Loops":** The current top-down technology transfer model must be replaced by **"Co-Creation Labs"** where agricultural universities validate traditional wisdom rather than just imposing lab techniques.
  - By formally recognizing **"Champion Farmers"** as adjunct faculty and codifying their experiential knowledge into the official curriculum, the system can bridge the **"Lab-to-Land"** credibility gap, ensuring that scientific research is responsive to the hyper-local realities of agro-climatic zones and pest dynamics.

Conclusion:

Natural farming represents a strategic shift from input-intensive agriculture to a **regenerative, climate-resilient, and fiscally rational food system**. However, its success hinges on **de-risking the transition phase**, correcting **asymmetric subsidy structures**, and building **credible markets and scientific validation**. With mission-mode implementation, outcome-based incentives, and institutional trust mechanisms, natural farming can transform soil health into a productive economic asset. Done right, it aligns **farmer income security, ecological sustainability, and long-term food sovereignty**.

Urban Governance Reforms for Viksit Bharat 2047

This editorial is based on "Missing municipal governance" which was published in The Financial Express on 18/01/2026. The article brings into focus the colonial-era urban governance model that sidelines elected mayors and concentrates power in unaccountable bureaucracies. This structural disconnect has produced inequitable, poorly serviced cities, casting doubt on India's vision of becoming Viksit by 2047.

India's urban centers remain trapped in a colonial governance framework where bureaucrats wield power over budgets larger than entire states, while elected mayors serve ceremonial roles. The result is stark: **millions in cities like Mumbai endure conditions rivaling war zones, lacking basic housing, clean water, and electricity,** while governance failures persist across all Indian metropolises. Despite rhetoric about **becoming 'Viksit' by 2047,** the fundamental disconnect between administrative structure and accountability has **left urban India without meaningful** municipal governance.

What is the Current Urban Governance Framework in India?

- Constitutional Foundation-The 74th Amendment Act (1992)
  - This Act gave **urban local bodies (ULBs) constitutional status,** moving India from a two-tier (Center-State) to a three-tier governance model. It added **Part IX-A** and the Twelfth Schedule to the Constitution.
  - Three-Tier Structure:
    - **Nagar Panchayat:** For areas in transition from rural to urban.
    - **Municipal Council:** For smaller urban areas.
    - **Municipal Corporation:** For larger urban areas.
  - **Devolution of Power (12th Schedule): Identifies 18 functional items for ULBs,** including urban planning, land use regulation, water supply, public health, and slum improvement.
  - **Mandatory Institutions:**
    - **State Election Commissions:** To conduct regular municipal elections.
    - State Finance Commissions **(SFCs):** To recommend the sharing of taxes between the State and ULBs.
    - **District & Metropolitan Planning Committees (DPCs/MPCs):** To consolidate plans from rural (Panchayats) and urban bodies into a holistic development plan.
- **Institutional Architecture**
  - Despite the constitutional mandate, the actual administrative power is often shared (or contested) between elected officials and bureaucratic appointees.
  - The Executive Structure:
    - **Commissioner System:** In most Municipal Corporations, executive power lies with a **State-appointed bureaucrat (Municipal Commissioner),** while the Mayor is often a ceremonial head with limited powers.
    - Mayor-in-Council: A few states (e.g., West Bengal) have experimented with a system where the Mayor has executive authority similar to a Chief Minister.
  - **Parastatal Agencies:** A major feature of Indian urban governance is the presence of **state-controlled "Parastatals" (e.g., Development Authorities like DDA/BDA, Water Supply Boards).**
    - These agencies often take over key functions (planning, water, transport) from the ULBs, leading to a fragmentation of accountability.
  - **Special Purpose Vehicles (SPVs):** Introduced largely by the **Smart Cities Mission,** these are corporate bodies created to execute specific projects, bypassing some traditional municipal bureaucracy to ensure faster implementation.
- **Programmatic Framework (Key Missions)**
  - The central government drives urban reform largely through **"Centrally Sponsored Schemes"** that link funding to specific governance reforms.

- AMRUT 2.0 (Atal Mission for Rejuvenation and Urban Transformation): Focuses on water security. It aims to provide universal coverage of water supply and make cities "water secure" through a circular economy of water.
- Swachh Bharat Mission - Urban (SBM-U) 2.0: Focuses on **"Garbage Free Cities,"** encompassing solid waste management, remediation of legacy dumpsites, and used water management.
- Smart Cities Mission: Having largely concluded its funding phase (March 2025), this mission institutionalized the use of **Integrated Command and Control Centres (ICCCs)** for data-driven city management and introduced the SPV model mentioned above.
- Pradhan Mantri Awas Yojana - Urban (PMAY-U): Focuses on providing all-weather pucca houses to all eligible beneficiaries, often using a **"beneficiary-led construction" model.**

- Recent Fiscal Developments
  - **Fifteenth Finance Commission:** Grants to ULBs are now often tied to performance reforms.
  - **Urban Infrastructure Development Fund (UIDF):** Managed by the National Housing Bank, this fund is designed to create urban infrastructure in Tier-2 and Tier-3 cities, supplementing the resources of smaller ULBs.
- Emerging Reforms in Urban Governance
  - **Greater Bengaluru Authority:** An attempt to consolidate fragmented service delivery agencies under one roof to optimize scarce resources.
  - **WATCO (Water Corporation of Odisha):** A state-owned, not-for-profit company acting as a prime example of a specialized, modern utility provider for urban water supply, sewerage.
  - **National Urban Policy Framework (NUPF):** It provides a strategic, holistic guide for States to manage rapid urbanization.

What are the Key Issues Associated with India's Urban Governance?

- **Fiscal Feebleness & Structural Dependency:** The Constitution of India specifies the taxes to be divided between the central and state governments but **it does not specify the revenue base for ULBs.**
  - Indian municipalities are functionally crippled by a lack of financial autonomy, relying heavily on discretionary grants rather than **"own-source" revenue like property tax.**
  - This **"fiscal infantilism"** prevents long-term infrastructure investment, forcing cities to look to the Centre or State for even basic operational costs, eroding the very spirit of the 74th Amendment's decentralization mandate.
  - For more than a decade, municipal revenues and expenditures have stagnated at about **1% of the GDP in India.**
- **The "Parastatal" Trap & Institutional Fragmentation:** Governance is paralyzed by a multiplicity of agencies **(SPVs, Development Authorities)** that bypass elected Urban Local Bodies (ULBs).
  - State-controlled "Parastatals" take over lucrative functions like land use and transport, leaving **ULBs with low-revenue tasks (garbage/slums),** creating a **"responsibility without power" syndrome** where accountability dissolves in the gaps between agencies.
    - The **fatal accident of techie in Noida (January 2026),** after his car plunged into an unbarricaded, water-filled pit, starkly highlights this governance vacuum.
    - Despite warnings since 2015 and a joint inspection as recently as October 2023, the hazard remained unaddressed due to institutional apathy.
  - **For instance, CAG Audit (2024)** across 18 states noted that **only 4 of 18 functions** (12th Schedule) are truly autonomous.
- **The "Ceremonial Mayor" & Bureaucratic Hegemony:** The Indian Mayor is largely a figurehead with no executive authority, while real power resides with the state-appointed Municipal Commissioner.
  - This disconnect breaks the democratic feedback loop; the person accountable to the voters (Mayor) cannot fire or direct the official who executes the work (Commissioner), rendering the municipal council ineffective.

- **Praja's Urban Governance Index (2024)** highlights that **only Kerala** gives Mayors the power to write the "Annual Confidential Report" (ACR) of Commissioners.
- **Planning Myopia & Climate Blindness:** Urban planning in India is rigid, static, and divorced from hydrological realities, **treating land as "real estate" rather than an ecosystem.**
  - Master Plans are often decades old or non-existent, leading to "concrete-centric" development that paves over natural drains, turning moderate rainfall into catastrophic urban flooding events (Pluvial Flooding).
  - **For instance, NITI Aayog** reports that **65% of Indian urban settlements** lack any Master Plan, India has only **1 planner per 100,000 people**.
    - **Bengaluru's "Brand Bengaluru"** struggle highlights how encroachment on **Rajakaluves (stormwater drains)** causes repeated tech-corridor inundation.
- **Personnel Paralysis & Capacity Vacuum:** ULBs suffer from a chronic **"Quantity and Quality"** deficit in human resources, lacking specialized technical staff like hydro-geologists or urban designers.
  - Recruitment powers are centralized at the State level, leading to massive delays in hiring, forcing cities to rely on short-term consultants or unskilled contractual labor for critical technical tasks.
  - **Praja Index 2024** flags significant concern is the high vacancy rate in sanctioned posts within Municipal Corporations. **9 cities viz. Ahmedabad, Gurugram, Shimla, Bhopal, Imphal, Aizawl, Amritsar, Greater Jaipur, and Kolkata have more than 40% vacant posts. Patna** has the highest percentage of vacant posts (89%) at the City Administration level.
    - In many cities, implementation of **AMRUT 2.0** is stalling because ULBs lack the technical experts to design "circular water economy" projects.
- **Participatory Democracy on Paper:** While the 74th Amendment mandates **"Ward Committees"** to decentralize power to citizens, they remain non-existent or **"paper tigers" in most states.**
  - Without these committees, governance remains a top-down exercise where citizens cannot hold the local corporator accountable for hyper-local issues like streetlights or drainage, defeating the purpose of self-rule.
  - Janaagraha's 2023 report stated that **5 out of 35 states/UTs have enacted the community participation law** and have notified rules for the same which requires a functioning ward.
    - The **Government of India framed a Model Municipal Law (2003)** to guide states in reforming municipal legislation, but its adoption and effective implementation have remained largely inadequate.
- **The "Processing vs. Collection" Disparity in Waste Management:** The Swachh Bharat Mission has successfully gamified "collection," but cities are failing **catastrophically at "processing" and "legacy waste" remediation**.
  - For instance, an estimated **77% of the waste generated in Indian cities is dumped into open landfills** without being treated.
  - We are effectively moving waste from doorsteps to **massive, fire-prone landfills because ULBs lack the technology and funds for scientific segregation and bio-remediation**, creating environmental time bombs.

What Measures can India Adopt to Strengthen Urban Governance?

- **Institutional: Implementing the "Mayor-in-Council" System:** To fix the fractured accountability where elected representatives have no power over appointed bureaucrats, states must transition to a **Mayor-in-Council** system.
  - This empowers the Mayor as the executive head, similar to a Chief Minister, restoring the democratic feedback loop where the administration is directly answerable to the people's mandate.
  - It **eliminates the "ceremonial figurehead" syndrome** and ensures that decision-making is driven by political will and public demand rather than bureaucratic inertia.

- **Financial: Institutionalizing "Value Capture Financing" (VCF):** Cities must move beyond reliance on state grants by aggressively adopting **Value Capture Financing** tools to monetize public infrastructure investments.
  - When a new Metro line or highway increases adjacent land prices, the ULB should capture a portion of this unearned increment through **"Betterment Levies" or higher FSI charges.**
  - This creates a **self-sustaining "virtuous cycle"** where infrastructure funds itself, reducing fiscal dependency on the Centre and ensuring that private windfall gains contribute to public good.
- **Planning: Mandating "Dynamic GIS-Based Master Plans":** The era of static, 20-year Master Plans must be replaced by **Dynamic, GIS-Based Local Area Plans** that can be updated in real-time.
  - By integrating satellite data with ground-level inputs, cities can actively monitor land-use changes, encroachments, and green cover rather than relying on outdated maps.
  - This allows for **"agile planning" where zoning regulations can adapt quickly to changing economic needs or climate risks**, preventing the haphazard, illegal sprawl that currently plagues peri-urban areas.
- **Governance: Empowering "Area Sabhas" for Hyper-Local Democracy:** To operationalize the 74th Amendment truly, states must devolve powers beyond Ward Committees to **Area Sabhas** (neighbourhood clusters).
  - By legally mandating Participatory Budgeting, where these Sabhas vote on specific allocations for local parks, streetlights, or drainage, citizens transition from passive voters to active partners.
  - This hyper-local oversight creates a powerful **"social audit" mechanism**, ensuring that municipal funds are spent on actual ground-level needs rather than vanity projects.
- **Sustainability: Adopting "Sponge City" Frameworks:** Urban governance must internalize climate resilience by legally mandating **Sponge City** principles in all building bylaws and public works.
  - This involves **enforcing "zero-runoff" regulations for large campuses,** revitalizing urban wetlands, and using permeable materials for pavements to absorb floodwaters.
  - **Shifting from "concrete-centric" engineering to "nature-based solutions"** turns the city itself into a water-harvesting infrastructure, tackling the twin crises of urban flooding and water scarcity simultaneously.
- **Regional: Activating "Metropolitan Planning Committees" (MPCs):** To manage the chaotic sprawl that spills beyond city limits, the constitutionally mandated **Metropolitan Planning Committees** must be activated with binding powers.
  - Currently, peri-urban growth is a "no-man's land" governed by rural panchayats ill-equipped for urbanization; MPCs would unify these fragmented jurisdictions under a single regional plan.
  - This ensures that essential grids like water supply, sewage, and transport are planned holistically for the entire metropolitan region, preventing the formation of unserviced "census towns."
- **Accountability: Legislating a "Right to Services Act" for Municipalities:** States should enact a strict **Urban Right to Public Services Act**, defining clear timelines for municipal services like birth certificates, water connections, and pothole repairs.
  - This legislation must include **automatic "penalty clauses"** where a delay results in a fine deducted from the responsible official's salary and compensated to the citizen.
  - This shifts the administrative culture from **"discretionary favors" to "entitled rights,"** forcing the bureaucracy to adhere to service level benchmarks or face direct financial consequences.

Conclusion:

India's vision of Viksit Bharat hinges on moving beyond colonial-era bureaucratic control to truly **empower urban local governments as envisaged under the 74th Amendment.** Strengthening mayoral authority, ensuring fiscal autonomy, and deepening citizen participation are essential to transform cities into resilient engines of growth, **advancing SDG 11 (Sustainable Cities and Communities)** and reinforcing the accountability needed for sustainable urban development.

Reimagining Higher Education in India

This editorial is based on "Second-generation reforms required in higher education to make India a developed nation" which was published in The Hindu on 22/01/2026. The article argues that while India has expanded access to higher education under NEP 2020, achieving the goal of a developed nation by 2047 requires second-generation reforms focused on institutional functioning, quality, and research ecosystems.

As India advances towards its **Viksit Bharat 2047** vision, the higher education ecosystem stands at a critical inflection point where scale has been achieved but quality remains uneven. With the **world's largest youth population** and rapidly expanding enrolments, universities are **no longer merely sites of instruction but engines of innovation, social mobility, and national competitiveness.** However, structural expansion without commensurate institutional capacity risks creating credential inflation rather than capability creation. This makes **deeper, second-generation reforms in governance, pedagogy, and research** indispensable for converting demographic advantage into developmental outcomes.

What is the Current Regulatory Framework for Higher Education in India?

- The Apex Regulatory Layer (Status: Transitioning):
  - **University Grants Commission (UGC):** Remains the primary funding and standard-setting body for universities (Central, State, Deemed).
    - It still determines the "Minimum Standards of Instruction" and grants degree-granting status.
  - **All India Council for Technical Education (AICTE):** Regulates technical education (Engineering, Management).
  - **National Council for Teacher Education (NCTE):** Specifically regulates teacher training institutes (B.Ed, D.El.Ed), ensuring curriculum standards for educators.
    - Currently, regulation is fragmented based on the "discipline" of education, but the **Viksit Bharat Shiksha Adhishthan Bill (2025)** aims to merge these into a single "Umbrella Body."
- The Accreditation Ecosystem:
  - **NAAC (National Assessment and Accreditation Council):** An autonomous body established in 1994 by the University Grants Commission (UGC) to **assess and accredit Higher Educational Institutions (HEIs) in India.**
  - **NBA (National Board of Accreditation):** It assesses the quality of technical and professional programs, such as engineering.
- **Key Professional Standard-Setting Bodies:** While the UGC/AICTE consolidate, specialized professions remain under their own "Guild Regulators" because these fields require specific practice licenses.
  - **National Medical Commission (NMC):** Replaced the MCI, regulates medical education and licensing.
  - **Bar Council of India (BCI):** Regulates legal education and law schools.
  - **Council of Architecture (CoA) & Pharmacy Council of India (PCI):** Set curriculum and practice standards for their respective fields.
  - **Institute of Chartered Accountants of India (ICAI):** Regulates Chartered Accountancy education, examinations, and professional practice under the **Chartered Accountants Act, 1949.**

What are the Key Developments in India's Higher Education System?

- **Emergence of Multidisciplinary and Research-Oriented Universities:** India's higher education is steadily transitioning **from siloed institutions to multidisciplinary, research-driven universities** aligned with **NEP 2020**.

- This shift strengthens problem-solving capacity, promotes innovation across disciplines, and improves graduate employability.
  - Targeted funding and outcome-based reform signal a move from expansion to institutional excellence.
- For instance, **under PM-USHA, over 600 projects have been approved**, with Multi-Disciplinary Education and Research Universities **(35 select state universities)** receiving grants of around **₹100 crore each** to enable multidisciplinary transformation and research capacity building.

- **Streamlining Regulation for Greater Academic Autonomy:** India is moving towards a **single, unified higher-education regulator** to replace fragmented oversight by bodies like UGC, AICTE and NCTE, in line with NEP 2020.
  - The proposed **Viksit Bharat Shiksha Adhikshan Bill, 2025** (earlier HECI concept) aims to streamline regulation, reduce compliance burden, and enable multidisciplinary education.
  - It envisages **separate verticals for regulation, accreditation, and academic standards**, promoting transparency and trust-based governance.
    - Funding functions are to remain with the government, while **medical and legal education are kept outside its ambit**.

- **Strengthening the Research and Innovation Talent Pipeline:** India is actively **expanding doctoral education** and **competitive fellowships** to build a robust research workforce.
  - Enhanced funding and national missions are improving research quality, interdisciplinary work, and global collaboration.
  - Under the new **PMRF 2.0 scheme**, announced in the Budget 2025-26, the government plans to **award 10,000 new fellowships over the next five years** to attract top talent for doctoral research at premier institutions like IITs and IISc.
    - These steps **position India to transition from knowledge consumption to knowledge creation.**

- **Mainstreaming Artificial Intelligence and Digital Learning:** AI and digital technologies are being integrated into **curricula, pedagogy, and institutional governance**, preparing students for future-ready careers.
  - This enhances learning personalization, research productivity, and industry alignment.
  - The **Union Budget 2025–26** announced a **dedicated Centre of Excellence in AI for Education** with a **budgetary allocation of ₹500 crore**.
    - The **Automated Permanent Academic Account Registry (APAAR)**is now becoming the mandatory "digital spine" of the education ecosystem, linking degrees, skills, and transfers.
  - Further **AICTE declared 2025 the "Year of AI,"** promoting AI-enabled curricula and has mandated **all its affiliated institutions to submit AI Implementation Plans** and adopt an **AI Affirmation Pledge** to integrate AI courses across all disciplines, including non-computer science branches like Mechanical and Civil Engineering.

- **Meaningful Integration of Indian Knowledge Systems and Languages:** Higher education reforms are embedding **Indian Knowledge Systems (IKS)** into mainstream disciplines with academic rigour.
  - Linguistic inclusivity in teaching and research broadens access and contextual relevance. This synthesis of tradition and modernity strengthens India's civilisational confidence.
  - For instance, institutions like **IIT Kharagpur have launched postgraduate programmes in IKS,** supported by MoE curriculum and faculty-development initiatives.

- **Democratising Access to Knowledge and Research**: Through, "**One Nation One Subscription" (ONOS)** Initiative, the government is democratizing research by **centralizing journal subscriptions**, removing the financial barrier that often cripples research in smaller, state-funded universities.
  - This ensures that a **student in a remote Tier-2 college has the same access to high-impact**

global research as a student in an IIT. The initiative provides **access to over 13,000 journals for more than 6,300 government academic and R&D institutes** including central and state-govt universities and colleges.
  - This **translates to nearly 1.8 Crore students, faculty and researchers getting access** to high quality research publications.
- **Expanding Academic Flexibility Through Credit Mobility:** The Academic Bank of Credits and multiple entry–exit frameworks are **institutionalising lifelong learning and learner mobility**.
  - These reforms enable students to customize learning paths while maintaining academic coherence. Digital platforms enhance transparency and portability of credentials.
  - For instance, institutions like **Delhi University** have fully integrated credit transfer and modular degree pathways.
- **Advancing Internationalisation and Global Academic Engagement:** India's higher education ecosystem is becoming **increasingly global through student mobility, joint research, and institutional partnerships.**
  - International exposure enhances academic standards and research impact while strengthening India's global knowledge footprint. **Policy focus is now on balancing inbound and outbound flows.**
  - The University of Southampton opened its **first foreign university campus in Gurugram** under UGC's 2023 regulations, enrolling students in UK-standard programmes.
    - Additionally, at least **12 foreign universities have received approval to set up campuses in India** across Bengaluru, Delhi NCR, Mumbai, and Chennai as part of the drive to internationalise higher education.
- **Institutionalising Student Wellbeing and Mental Health Support:** Student wellbeing is now recognised as **central to academic success and institutional quality**. Higher education institutions are **embedding counselling, mentoring, and stress-management systems into academic planning.**
  - This creates healthier, more resilient learning environments.
  - For instance, **UGC has issued a Uniform Mental Health Policy** mandating counselling centres in HEIs.
    - Several central universities have operationalised full-time mental health and mentorship frameworks.

What are the Key Issues Associated with India's Higher Education System?

- **The "Degree-Employability" Paradox:** Indian universities are functioning as **"degree factories"** where theoretical rote learning supersedes practical skill acquisition, creating a massive workforce that is credentialed but not competent.
  - This disconnect drives the phenomenon of **"unemployable graduates"**, forcing industries to incur huge training costs or leave positions vacant despite high youth unemployment.
  - A January **2026 report by TeamLease Edtech**, (titled "From Degree Factories to Employability Hubs,") notes that **75% of Higher Education Institutions (HEIs) in India are not industry-ready.**
- **Chronic Faculty Shortage & "Ad-hocism"**: The system is crippled by a severe **scarcity of permanent faculty**, leading to an **over-reliance on temporary (ad-hoc) teachers** who lack research incentives and job security.
  - This erodes institutional memory, disrupts mentorship, and stalls the **"Vishwaguru"** aspiration of becoming a global knowledge hub.
  - A 2024 Parliamentary committee revealed **56% of professor posts** in Central Universities are vacant, with over **5,400 total teaching vacancies** across central institutes.
- **Persisting Access Concerns Despite Higher Public Funding:** While the Union **Budget 2024–25 increased allocations for higher education**, the **underlying shift towards privatization and self-financing courses continues**, limiting the real distributive impact of public spending.
  - Much of the enhanced funding is **absorbed by**

institutional expansion and capital outlays rather than scholarships and fellowships, leaving marginalized students vulnerable to rising fees.
    - As a result, access for economically weaker sections remains constrained, and student unrest persists despite the apparent budgetary hike.
- **The Mental Health & Student Welfare Crisis:** Campuses are increasingly becoming high-pressure cookers marked by **academic hyper-competition**, caste-based discrimination, and social isolation, with inadequate institutional support mechanisms.
  - The **lack of functional wellness centers** and the stigma around seeking help have turned student distress into a silent epidemic.
  - For instance, a NIMHANS, Bengaluru study found that **12.3% of participants reported suicidal ideation in the previous year, 5.2%** had attempted suicide, and **over one-third (34.8%) of those with ideation went on to attempt suicide.**
- **Research Stagnation & Bureaucratic Red Tape:** Despite the launch of the **Anusandhan National Research Foundation (ANRF)**, India's research output is hampered by delayed grant disbursements, lack of autonomy, and poor infrastructure in state universities.
  - The ecosystem rewards **"safe" theoretical papers over high-risk innovation** or patentable technology, keeping India's R&D impact low globally.
  - Further, India's R&D expenditure remains stagnant at **0.64% of GDP**, far below **China's 2%,** limiting innovation .
- **Higher Education Ranking and Accreditation Challenges:** India's higher education quality assurance is hampered by **limited accreditation coverage and concerns over credibility**, which undermine the reliability of rankings and institutional quality signals.
  - Despite **NAAC's role in promoting standards**, procedural gaps and integrity issues have eroded trust, affecting how institutions are perceived domestically and internationally.
  - For instance, over **30% of higher education institutions** in India are still not accredited by NAAC, leaving a large proportion operating without formal quality validation.
    - These challenges also constrain the impact of frameworks like NIRF, with few Indian universities consistently ranked at the top globally.
- **Regional & Social Disparities in Access (GER):** While the overall **Gross Enrolment Ratio (GER)** is improving, it masks deep geographical and social fissures, with high concentration in southern states and low enrolment in the hinterlands.
  - The **"massification" of education has not been equitable,** as Tier-2/3 city students struggle with poor quality infrastructure compared to their metropolitan peers.
  - The **North-South Divide persists**, Southern states continue to lead significantly. Tamil Nadu (47%) and Kerala (41.3%) have GERs nearly double those of northern states like **Bihar (17.1%)** and **Uttar Pradesh (24.1%)**.
- **The Examination Integrity Crisis**: The credibility of centralized entrance tests has **collapsed due to repeated administrative failures**, leading to massive litigation and loss of student trust.
  - For instance, the **centralization of exams under the National Testing Agency (NTA)** has created a **"single point of failure,"** where **one leak affects millions, causing psychological trauma** and delaying academic calendars nationwide.
  - The **NEET-UG 2024 paper leak** scandal **affected 24 lakh aspirants,** leading to CBI investigations in states like Bihar and Gujarat.
    - Additionally, **the UGC-NET June 2024 was cancelled a day after being held** due to compromised integrity.
- **Political Erosion of Institutional Autonomy:** Universities are increasingly becoming ideological battlegrounds where the appointment of **Vice-Chancellors (VCs) is driven by political loyalty rather than academic merit**. This **"governance paralysis"**

delays decision-making and curriculum reforms, **as State Governments and Governors (Chancellors) lock horns over control**, leaving top posts vacant.
  - For instance, **in 2024-25, universities in Kerala and West Bengal faced administrative gridlock due to VC appointment disputes.**

What Measures are Needed to Strengthen Higher Education in India ?

- **Institutional Autonomy via "Graded Self-Governance" Frameworks:** To dismantle the **"affiliation raj,"** regulators must aggressively transition universities towards a **Maturity-Based Graded Autonomy** model.
  - This involves replacing rigid, top-down inspection regimes with a **"light but tight" oversight mechanism** where high-performing institutions earn total academic, administrative, and financial freedom.
  - By **decoupling operational decisions from bureaucratic approval**, institutions can rapidly innovate curriculum and launch niche courses.
    - This shift empowers leadership to act as **"Edu-Entrepreneurs"** rather than administrators, fostering a culture of accountability and rapid responsiveness to global educational trends.
- **"Triple Helix" Innovation Clusters for Regional Development:** Universities must move beyond isolated existence to become the core of **Hyper-local Innovation Clusters**, adopting the **"Triple Helix" model of Government-Academia-Industry collaboration.**
  - Institutions should be incentivized to **map their research directly to the specific economic and developmental needs** of their immediate geographic region (e.g., **agritech in rural belts, textiles in industrial hubs**).
  - This creates a symbiotic ecosystem **where students work on live regional challenges, industries get tailored R&D solutions**, and universities become indispensable engines of local economic growth rather than just degree-granting silos.
- **Mainstreaming "Apprenticeship-Embedded" Degree Architectures:** India must aggressively pivot from **"theory-first" to "Competency-Based" Credentialing**, where every general stream degree (BA, BSc, BCom) mandates an immersive apprenticeship component.
  - By integrating the National Credit Framework (NCrF) with industry skill standards, universities can offer degrees where 30-40% of credits are earned in the corporate office.
    - This **dissolves the employability gap** by ensuring graduates possess **"tacit knowledge"** and soft skills that classroom lectures cannot impart, effectively turning higher education into a continuous pipeline of **"job-ready**" talent.
- **Modernising Faculty Tenure via "Professor of Practice" Integration:** Addressing the faculty crunch requires a dual-pronged strategy: institutionalising **Continuous Professional Development (CPD)** for existing staff and normalizing the **"Professor of Practice"** (PoP) track.
  - The PoP model allows distinguished experts with non-academic industry experience to **teach without the traditional PhD prerequisite, injecting market realism into the syllabus**.
    - Simultaneously, tenure tracks for regular faculty should be linked not just to research output but to **"andragogical innovation" (teaching excellence) and institutional service**, creating a balanced academic workforce that values mentorship as much as publication.
- **Financial Resilience through "Diversified Endowment" Mechanisms:** Public universities must reduce their singular reliance on state grants by developing robust, professionalized **Endowment Management Offices**.
  - Following the model of the **Higher Education Financing Agency (HEFA),** institutions should be **empowered to leverage their alumni networks, patent portfolios, and consultancy arms** to build a sovereign corpus.

- This financial autonomy allows for long-term **strategic investments in "high-risk, high-reward"** research infrastructure and student welfare that government budgets often cannot cover, insulating the academic core from fiscal volatility.

- **Democratising Quality via "Phygital" Learning Ecosystems:** The future lies in breaking the **"Iron Triangle"** of access, cost, and quality by embracing a **"Phygital" (Physical + Digital)** delivery architecture.
  - Top-tier institutions should function as "hub" universities, broadcasting high-quality lectures and resources to "spoke" colleges in remote areas via the **Academic Bank of Credits (ABC) system.**
  - This creates a **"networked university" model where a student in a rural college can earn credits from a premier institute**, ensuring that geography is no longer a barrier to accessing world-class pedagogical content and standardized assessment.
- **"Internationalisation at Home" via Twinning & Joint Research:** Instead of solely focusing on sending students abroad, India must prioritize **"Internationalisation at Home"** by operationalizing **Twinning Programs and Joint Degree regulations.**
  - By simplifying the regulatory pathway for **Foreign Higher Education Institutions (FHEIs) to** partner with Indian counterparts, we can import global best practices in curriculum and governance directly onto Indian campuses.
  - This strategy **prevents "brain drain"** by offering global exposure domestically and fosters **"Collaborative Online International Learning" (COIL)**, raising the aggregate benchmark of Indian higher education.
- **Depoliticising University Leadership Appointments:** A **transparent, rule-based VC appointment framework** should be institutionalised through an independent National Higher Education Leadership Commission.
  - **Search-cum-selection committees** must have a **clear majority of eminent academics**, fixed timelines, and publicly disclosed shortlists to reduce discretion.
  - **Binding SOPs should limit the role** of Chancellors/Governments to **procedural oversight, not veto power**. This would ensure merit-based leadership, continuity in governance, and insulation of universities from partisan conflict.

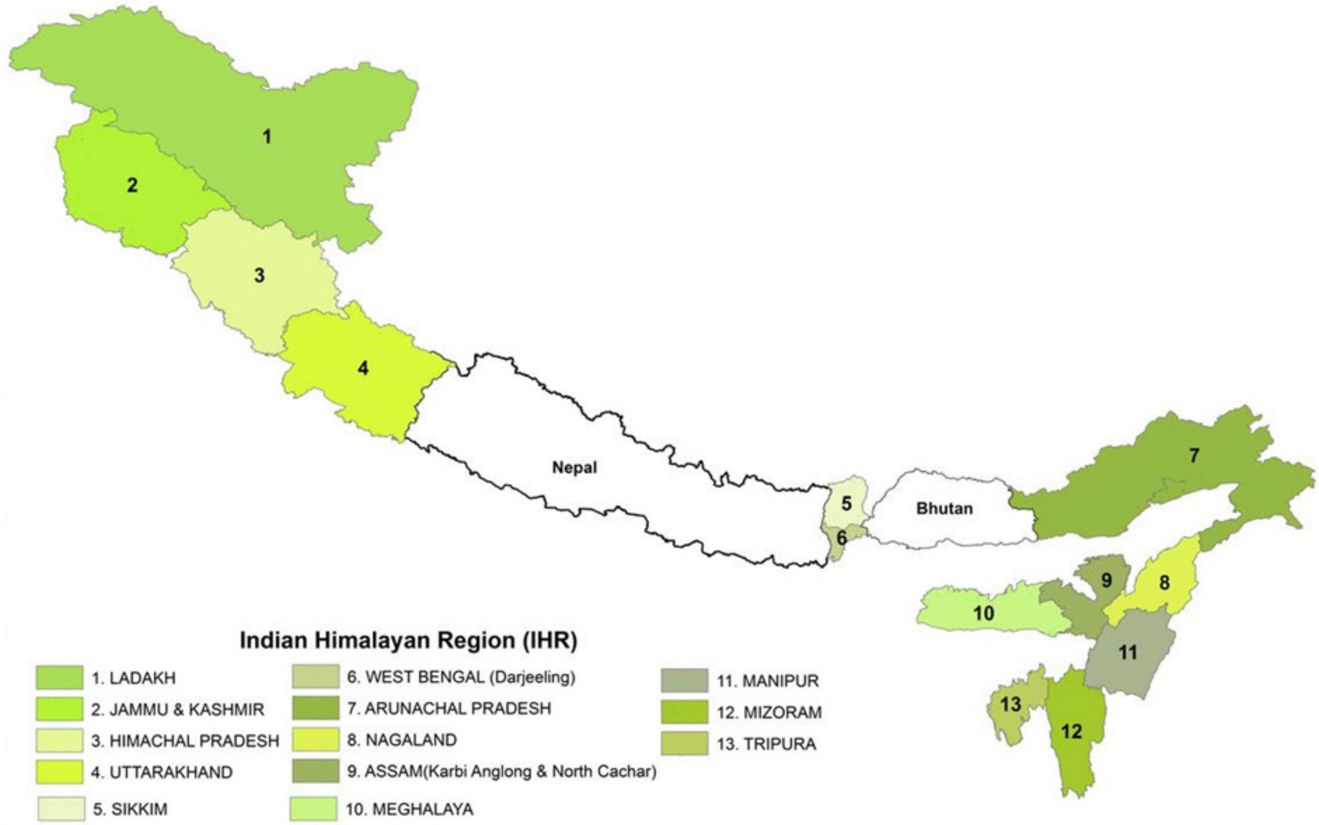
Conclusion:

India's higher education journey has moved beyond the challenge of expansion to the imperative of **excellence with equity**. Achieving ***Viksit Bharat 2047*** **will depend not on policy vision alone, but on institutions that function autonomously, innovate fearlessly, and deliver employable knowledge at scale**. Second-generation reforms must therefore convert universities from degree-dispensing centres into **engines of research, skills, and social mobility**. Only then can India transform its demographic dividend into a lasting developmental advantage.

Towards A Resilient Indian Himalayan Region

This editorial is based on "A dangerous march towards a Himalayan ecocide" which was published in The Hindu on 23/01/2026. The article highlights how unsafe land use, infrastructure overreach and ecological disregard are turning climate stress into recurring disasters in Himalayas .The article argues for prioritising disaster resilience and science-based planning over disaster-prone projects in one of India's most fragile and vital ecosystems.

The Himalayas, one of the world's most climate-sensitive mountain systems, are warming **nearly 50% faster than the global average**, transforming rare disasters into recurring events. In **2025 alone, over 4,000 lives were lost** to climate-linked extremes in India , with Himalayan States bearing a disproportionate burden. What appears as a natural calamity is increasingly a **man-made risk**, driven by unsafe land use and infrastructure excess in fragile terrain. The Himalayan crisis today is not merely environmental, but a **decisive test of India's development wisdom and disaster resilience.**



What is the Significance of Himalayan Ecosystem for India?

- **Hydrological Security as the "Water Tower of Asia":** The Himalayas function as a critical **"Third Pole,"** storing vast freshwater reserves that feed the perennial river systems (**Indus, Ganga, Brahmaputra**), sustaining India's agrarian core.
  - This cryospheric reserve releases meltwater **during the dry pre-monsoon months, acting as a crucial buffer** against drought for the Northern Plains **"food bowl."**
  - For instance, The Hindu Kush Himalayas (HKH) supports **about 240 million** mountain residents and **nearly 1.65–1.9 billion** downstream beneficiaries including India**.**
- **Climatological Thermostat & Monsoonal Engine:** This mountain chain acts as a **massive climatic barrier, preventing frigid Central Asian katabatic winds from turning North India into a cold desert** while simultaneously trapping the moisture-laden **Southwest Monsoon winds.**
  - This **"orographic lift"** is the primary driver of precipitation for the subcontinent, regulating the **wet-dry cycles** essential for the Kharif crop cycle.
  - The range ensures the Gangetic plains receive **1000+ mm of annual rainfall**.
- **Strategic "Geopolitical Rampart" & Border Defence:** The Himalayas provide a **natural high-altitude fortress along the Line of Actual Control (LAC)**.
  - The region is now the focal point of **India's "Dual-Use Infrastructure" strategy,** balancing troop mobility with civilian connectivity to prevent depopulation of border areas.
  - For instance, the **Sela Tunnel**, operationalized in 2024, ensures all-weather access to Tawang. Also the **Vibrant Villages Program** has allocated **₹4,800 crore** to develop 663 border villages **to secure this "living wall."**
    - This **counters the 628 "Xiaokang"** defense villages China has constructed along the LAC.

- **Green Energy Powerhouse:** The Himalayas sit at the heart of India's renewable energy transition.
  - Its steep altitudinal gradients generate high kinetic energy ideal for run-of-the-river projects that can stabilize grid intermittency from solar and wind.
  - The region has an estimated **hydropower potential of 115,550 MW**, of which **about 46,850 MW (≈40%) is already installed**, making the region the country's largest hydropower reservoir.
- **Biodiversity Reservoir & Pharmacological Goldmine:** As one of just four global "Biodiversity Hotspots" in India, the Himalayas serve as a genetic vault for endangered flora and potential pharmaceutical breakthroughs (Ayush).
  - This biological richness provides **essential ecosystem services like pollination and soil stability.**
  - For instance, out of the roughly **10,000 vascular plant species in the Himalayan Biodiversity Hotspot, approximately 3,160 species** (representing 71 genera) are endemic, meaning they are found nowhere else on Earth.
- **Cryospheric Sentinel for Global Warming:** The health of Himalayan glaciers serves as the most visible **"Climate Dashboard" for India,** providing early warnings of planetary tipping points that impact sea-level rise and coastal security thousands of kilometers away.
  - The rate of glacial retreat here **directly correlates to the future submergence risks of coastal metros like Mumbai and Kolkata** due to thermal expansion and meltwater.
- **Socio-Economic Corridor & Sustainable Tourism:** The region supports a unique **"High-Altitude Economy"** driven by **spiritual tourism and horticulture**.
  - Sustainable management here is critical to prevent **"demographic drainage"** where locals migrate out due to disaster risks, leaving strategic border zones uninhabited.
  - The Char Dham Pariyojana is an ongoing highway project designed to provide **all-weather connectivity to the four shrines** namely **Kedarnath, Badrinath, Yamunotri, and Gangotri.**

What Measures has India taken to Promote Sustainability in the Indian Himalayan Region?

- **Eco-Mobility Shift- "Parvat Mala" (National Ropeways Programme):** The government is aggressively replacing land-scarring road widening with aerial ropeways to minimize slope destabilization and tectonic triggering.
  - It has a target of **1,200 km of ropeways** across 250+ projects (Budget 2024-25)
    - For instance, **Sonprayag-Kedarnath Ropeway cut** travel time from 8 hours to **36 minutes**, reducing human pressure on trekking routes.
  - This **"zero-footprint" mobility model** bypasses fragile terrain entirely, offering a high-density transport alternative that significantly lowers landslide risks compared to traditional four-lane highways.
- **Community-Led Conservation "SECURE Himalaya" Project:** Moving beyond fencing-off forests, this initiative integrates snow leopard conservation with sustainable livelihoods to reduce human-wildlife conflict.
  - It covered **major landscapes** (e.g., Gangotri-Govind, Kanchenjunga) and trained **1,000+ local youth** in nature guiding and surveillance.
  - By treating local communities as the **"first line of defense,"** it monetizes conservation through eco-tourism and medicinal plant value chains, ensuring that protecting biodiversity becomes economically viable for high-altitude dwellers.
- **Judicial "Carrying Capacity" Mandate & Legal Rights:** A landmark shift in governance has occurred with the Supreme Court legally recognizing the **"Right to be Free from Adverse Climate Effects" as a fundamental right (M.K. Ranjitsinh vs Union of India**).

- This has forced the executive to **halt the "unlimited growth"** model. The **Ministry of Environment, Forest and Climate Change** has proposed measures to accurately assess the carrying capacity of the **13 Himalayan states.**
  - In **Ashok Kumar Raghav vs Union of India**, the Supreme Court also called to address the uncontrolled development in the Indian Himalayan Region (IHR) by pushing for action plans based on "carrying capacity".
- **Decentralized Energy Transition-"PM Surya Ghar" in Hills:** To reduce reliance on grid transmission lines (which require deforestation) and diesel generators in remote areas, the government is pushing decentralized rooftop solar micro-grids.
  - The government has issued guidelines that **offer an additional 10% subsidy per kW for "Special Category States"** which include the **North-Eastern states and hilly regions like Uttarakhand, Himachal Pradesh, Jammu & Kashmir,** and Ladakh.
  - This enhances energy security during disasters when main grids fail and reduces the **"Black Carbon"** emissions from diesel that accelerate glacial melting.
- **Hydrological Revival- "Springshed Management" Framework:** Recognizing that glaciers are retreating but **"springs" (dharas) are the immediate lifeline, NITI Aayog has shifted focus to aquifer recharge over dams**.
  - This **"Dhara Vikas" approach** maps underground aquifers to revive drying springs, ensuring water security for hill agriculture without altering natural river flows.
  - According to a 2018 report by NITI Aayog, **nearly 50% of springs in the IHR are either drying up or have already dried up**.
    - For instance, project has successfully rejuvenated **over 50 lakes and dozens of springs, in Sikkim** positioning it as a national model
- **"Security Through Sustainability"- Vibrant Villages Programme (VVP)**: Moving beyond traditional military fortification, this program treats border security as an ecological and demographic challenge.
  - The strategy is to reverse **"out-migration"** from sensitive border zones by creating **"climate-smart" livelihoods** (eco-tourism, organic clusters), ensuring that border villages remain populated and act as strategic **"eyes and ears"** without necessitating heavy, ecologically damaging military infrastructure.
    - For instance, **Kibithoo (Arunachal)** transformed into a "smart village" pilot.
- **Circular Economy Pilot- "Deposit Refund Scheme" (DRS) & EPR:** To combat the plastic crisis choking Himalayan headwaters, states like **Himachal Pradesh are piloting a "buy-back" model.**
  - This policy forces producers to pay for waste retrieval and incentivizes locals to collect non-biodegradable packaging, effectively putting a **"price tag" on litter to create a self-sustaining waste collection economy in difficult terrain.**
  - The Himachal Pradesh cabinet has launched 'Deposit Refund Scheme 2025', offering cash refunds for returned non-biodegradable packaging to tackle waste.
- **Tech-Integrated Resilience- "Glacial Lake Early Warning Systems" (GLEWS):** In response to the escalating threat of **Glacial Lake Outburst Floods (GLOFs),** the NDMA has shifted from reactive relief to proactive, automated surveillance.
  - This involves installing **Over-the-Horizon (OTH) radars** and satellite-linked sensors at high-risk glacial lakes to provide a critical **"lead time" (pre-warning) for downstream evacuations,** integrating space tech with last-mile community radio connectivity.
  - Under the National GLOF Risk Mitigation Programme , early warning systems have been operationalised at **South Lhonak Lake (Sikkim)** and **Shako Cho (Sikkim)**, combining lake-level sensors, remote sensing and community-based alert dissemination to reduce loss of life from sudden outburst floods.
- **Scientific Capacity & "Knowledge-Policy" Bridge (NMSHE Phase-II):** The National Mission on

Sustaining Himalayan Ecosystem has pivoted from passive observation to active **"evidence-based policymaking".**

- This institutional mechanism now forces Himalayan states to align their State Action Plans on **Climate Change (SAPCC)** with rigorous district-level vulnerability maps, replacing ad-hoc decisions with long-term **"climate-risk informed"** governance.
- **Under Phase-II (2021-2026)** NMSHE mobilized **key Thematic Task Forces** (e.g., Himalayan Agriculture, Forest Resources & Plant Diversity etc) and **IIT Roorkee's new Centre of Excellence** now provides real-time disaster risk data directly to state disaster management authorities.

What Challenges are Associated with the Indian Himalayan Region?

- **Cryosphere Collapse and Hydrological Destabilization:** The "Third Pole" is witnessing an **irreversible cryosphere retreat where rising temperatures are not just melting glaciers but altering precipitation phases** (snow to rain), destabilizing the hydrological reliability for downstream agriculture and energy.
  - This shift creates a **"wet-drought" paradox where** intense localized flooding followed by prolonged water scarcity, threatening India's water tower status.
  - For instance, **65% faster ice mass loss was recorded** in Hindu Kush Himalayas (as per ICIMOD 2024).
    - Further**, South Lhonak GLOF (Sikkim, October 2023)** released 50 cubic million of water, **destroying the Teesta III dam**.
- **Infrastructure-Induced Slope Instability (The "Sinking" Syndrome):** Rapid urbanization and strategic mega-projects (highways, tunnels) ignore shear zones and tectonic fragility, leading to severe land subsidence and slope failures.
  - The **heavy engineering approach (blasting and vertical cutting)** without adequate muck disposal or drainage planning has activated dormant landslides, turning habitable towns into disaster zones.
  - For instance, an analysis of the Joshimath subsidence shows that between **December 2022 and December 2024, parts of Joshimath sank by more than 30 cm.**
- **Carrying Capacity Overshoot and "Overtourism" Stress:** Unregulated religious and adventure tourism has breached the ecological carrying capacity, creating a severe resource-waste imbalance in high-altitude zones.
  - The **"pump-and-dump" tourism model** depletes local springs for luxury consumption while leaving behind non-biodegradable waste that leaches microplastics into headwaters, poisoning the ecosystem at the source.
  - For instance, the physical **carrying capacity of Kedarnath is around 24,500 visitors per day, but its real carrying capacity is 9,833.**
  - NITI Aayog and World Bank estimates show that the Indian Himalayan Region now generates **5–8 million metric tonnes of waste annually. Moreover most** of these waste are non recyclable.
- **Black Carbon and Albedo Feedback Loops:** Regional pollution from biomass burning and vehicular emissions **deposits Black Carbon on glaciers**, darkening the surface and reducing albedo (**reflectivity**).
  - This accelerates **melting even in sub-zero temperatures, creating a dangerous feedback loop where "dirty snow"** absorbs more heat, amplifying local warming rates beyond the global average.
  - A new study (by Climate Trends titled "Impact of Black Carbon on Himalayan Glaciers) suggested that the increase in black carbon emissions has **accelerated the melting process in the Himalayas by 4°C over the past two decades**, with high concentrations seen in **Eastern and Central Himalayas.**
- **Biodiversity Homogenization and Habitat Fragmentation:** Linear infrastructure **(railways, transmission lines) is severing wildlife corridors,**

forcing animals into human settlements and leading to genetic isolation of species like the Snow Leopard.

- Simultaneously, warming allows invasive species to climb to higher altitudes, outcompeting native alpine flora and homogenizing the unique biodiversity of the region.
- A 2024 study **by the Indian Institute of Remote Sensing (IIRS)** recorded **an 11% decline in natural forest cover between 1991 and 2023** in the rapidly urbanising Western Himalaya regions. This loss is primarily driven by an 184% increase in urbanization and infrastructure development.
  - Further, Projects like **railways and power lines have led to a 71.5% fall in the number of large forest patches** across India, significantly **increasing "edge-to-interior" ratios** and **causing habitat fragmentation**, especially in Himalayan region.

- **Institutional Fragmentation and Policy Dilution:** Himalayan governance remains siloed, with **roads, hydropower and tourism handled by separate ministries** in the **absence of a unified, Himalayan-specific building code or integrated ecological oversight.**
  - The dilution of **EIAs for "strategic" projects** has weakened legal safeguards, enabling ecologically irreversible interventions.
  - Under the **Forest (Conservation) Amendment Act, 2023**, projects within 100 km of the LAC/International Border are exempt from forest clearance, allowing **strategic projects** to bypass full EIAs in sensitive landscapes such as **Changthang (Ladakh).**
- **The "Seismic Gap" and Reservoir-Induced Risks:** The Central Himalayas lie over an **active seismic gap** where accumulated tectonic stress is increasingly compounded by the immense water load of mega-dams, heightening the risk of reservoir-induced seismicity.
  - Placing **rigid concrete structures over active shear zones without adequate seismic buffers turns future earthquakes** into cascading failures rather than isolated tremors.
    - The NGRI (2025) flags the region as overdue for a **nearly M8.5 earthquake**, while **over 1,500 micro-tremors** recorded near the Tehri Dam indicate rising stress on local fault lines.
- **"Winter Fire" Regimes and Carbon Sink Reversal:** A catastrophic ecological inversion is occurring where traditional summer fires now rage in winter due to **"snow droughts" and dry biomass accumulation**, effectively turning the Himalayan carbon sink into a net emitter.
  - This thermal anomaly **incinerates dormant seed banks and facilitates the aggressive invasion of flammable chir-pine into moisture-retaining oak forests**, permanently desiccating the soil and destroying the mountain's natural water-sponge capability.
  - Uttarakhand and the Central Himalayan region are **witnessing an abnormally dry winter, with negligible rainfall and snowfall leading to crop losses**, hydrological stress, and **risks of negative glacier mass balance**.
    - The severity of this climate anomaly is evident from forest fires reported even in high-altitude protected areas such as the **Nanda Devi National Park.**
    - In Uttarakhand Himalayas between 14th January and 20th January, 2026, there were 440 forest fires compared to 45 in the same period in 2025, nearly a ten-fold increase.

What Measures are Needed for Sustainable Management of Indian Himalayan Region?

- **Enforce a Himalayan-Specific Land-Use and Building Code**: India needs a legally binding **Himalayan Mountain Code** that replaces generic plains-based norms with slope-sensitive, geology-aligned standards.
  - This code must **regulate road width, hill-cut angles, tunnel density, building height, and permissible load in seismic and landslide zones.** Development permissions should be conditional on micro-zonation and cumulative impact thresholds.

- Such a code would convert **"precaution" from advisory to enforceable law.**

- **Shift from Infrastructure-Led Growth to Resilience-Led Planning:** Development strategy must pivot from asset creation to **risk minimisation**, making disaster resilience the primary design parameter.
  - Infrastructure should be evaluated not by speed or capacity, but by **lifetime stability, maintenance burden and failure consequences**.
  - This requires **embedding geologists, ecologists and disaster scientists at the project design stage rather than post-clearance retrofitting**. Resilience-first planning reduces long-term fiscal and human costs.
- **Institutionalise Cumulative Impact and Basin-Scale Assessments:** Project-wise clearances must give way to **landscape and river-basin level planning**, especially for hydropower, roads and tourism clusters.
  - Basin authorities should cap infrastructure density based on slope stability, sediment load and carrying capacity.
  - This **prevents the "death by a thousand cuts"** effect **where individually cleared projects collectively destabilise entire valleys**. Integration across sectors is the only way to arrest systemic risk.
- **Prioritise Nature-Based Solutions as Core Infrastructure:** Forests, wetlands, alpine meadows and riparian buffers should be treated as **critical natural infrastructure**, not auxiliary conservation assets.
  - **Slope stabilisation through native afforestation, flood moderation through wetlands and avalanche control through forest belts** are often cheaper and **more durable than engineering fixes**.
  - Budgetary allocations must explicitly fund ecosystem restoration as a disaster-risk-reduction strategy. **This aligns ecological repair with economic prudence.**
- **Regulate Tourism Through Carrying Capacity and Spatial Zoning:** Tourism policy must move from volume-driven to **capacity-regulated and seasonally staggered models**.
  - Fragile zones should have strict caps on footfall, vehicles and construction, enforced through permits and pricing signals.
  - **Tourism infrastructure should be decentralised** to spread pressure and stabilise local livelihoods. Managed tourism protects both ecosystems and the economic base that depends on them.
- **Re-engineer Hydropower and Transport with Context-Sensitive Design:** Hydropower and road projects must adopt **terrain-adaptive designs**, narrower roads, flexible alignments, minimal tunnelling, and distributed energy systems over mega-structures.
  - Geological uncertainty should be treated as a design constraint, not an inconvenience.
  - **Retrofitting unstable projects must be secondary** to preventing destabilising designs in the first place. This reduces lock-in of irreversible risk.
- **Strengthen Local Institutions and Community Stewardship:** Local communities must shift from being project-affected stakeholders to **co-managers of landscapes**. Empowering panchayats with planning authority, disaster funds and ecological monitoring roles improves compliance and early warning.
  - **Indigenous knowledge on slope behaviour, water flows and forest management should inform formal decision-making**. Decentralised stewardship enhances legitimacy and on-ground effectiveness.
- **Integrate Climate, Disaster and Development Governance:** Climate adaptation, disaster risk reduction and infrastructure planning should be merged into a **single governance framework for the Himalayas**. Fragmented mandates dilute accountability and encourage policy evasion.
  - Unified planning **enables long-term horizon setting, trade-off evaluation and transparent prioritisation**. Protecting the Himalayas requires governing them as a connected earth system, not as isolated administrative sectors.

Conclusion:

Protecting the Himalayas is **no longer a choice between development and conservation,** but a **choice between foresight and failure**. When fragile mountains are forced to carry plains-based ambitions, disasters become policy-made, not natural. **A resilience-led, ecology-first governance framework is the only pathway** that secures lives, livelihoods and national security. In the Himalayas, **sustainability is not an ideal , it is the last line of defence.**

Strengthening India'S Cyber Security Architecture

This editorial is based on "Cybercrime and the crisis of global governance" which was published in The Hindu on 27/01/2026. This article highlights how divisions over the UN Convention against Cybercrime reflect a deeper crisis in global digital governance, posing strategic challenges for India's cyber sovereignty and institutional autonomy.

In an increasingly fragmented global digital order, cybersecurity has emerged as a critical test of strategic autonomy. The divisions surrounding the United Nations Convention Against Cybercrime reveal the **widening gap between shared principles and contested practices in cyberspace governance**. As cyber threats grow transnational and technology-driven, countries like India face the dual challenge of securing its digital ecosystem while retaining institutional control over data and regulation. Cybersecurity, therefore, is no longer merely defensive, **it is central to India's role in shaping global digital governance.**

What are the Major Cyber Threats Confronting India?

- **AI-Enabled and Automated Cyber Attacks:** The integration of artificial intelligence into cybercrime has significantly increased the scale, speed, and sophistication of attacks.
  - AI is being used to **generate highly convincing phishing emails, deep fake audio/video impersonations, and adaptive malware** that can evade traditional detection systems.
  - **Automated vulnerability scanning allows attackers to identify and exploit system weaknesses in real time**, making cyber defences reactive rather than preventive.
    - For India, with its rapidly expanding digital public infrastructure, AI-driven attacks pose systemic risks.
    - In **2024–25**, Indian banks and NBFCs reported a surge in **AI-generated phishing emails and voice-cloning scams**, where fraudsters used **deep fake audio to impersonate senior executives** and authorise fund transfers.
- **Ransomware and Malware-as-a-Service (MaaS)**: Ransomware has **evolved from isolated criminal activity into an organised, transnational business model.**
  - **Malware-as-a-Service enables even low-skill actors to launch complex attacks** by **renting ready-made tools**. Ransomware accounted for **one of the top three cyber threats** reported to CERT-In in recent years.
  - Indian sectors such as **healthcare, municipal services, education, and MSMEs are increasingly targeted due to weak cyber hygiene** and low recovery capacity.
    - For instance, **AIIMS Delhi in 2022** suffered a major ransomware attack that paralysed patient registration, lab services, and OPDs for nearly **two weeks**, exposing vulnerabilities in critical healthcare systems.
- **Data Breaches and Exploitation of Cloud Vulnerabilities:** As Indian institutions rapidly migrate to **cloud-based systems, misconfigurations, weak access controls, and poor encryption practices** have emerged as major vulnerabilities.
  - Large-scale data breaches **expose sensitive personal, financial, and biometric data (eg, Aadhaar data leaked) , undermining citizen trust in digital governance**.
    - For instance, In **2023**, data linked to **CoWIN beneficiaries**, including names, Aadhaar-linked details, and phone numbers, was reportedly accessible through a **Telegram**

bot, highlighting **vulnerabilities in access controls and third-party integrations** rather than core databases.

- Such breaches also have cross-border implications, complicating law enforcement and accountability.

- **Social Engineering and Digital Financial Fraud**: Cybercriminals increasingly exploit human behaviour rather than technical loopholes, as seen in the rise of **"digital arrest" scams**.
  - **UPI-based frauds, SIM-swap attacks, and fake investment platforms** disproportionately affect first-time digital users.
    - This reflects the gap between rapid financial inclusion and digital literacy, making citizens the weakest link in cybersecurity.
  - In **2024 alone**, Indian citizens reported **losses of over ₹22,845 crore** to cyber fraud. This was a **206% increase** from 2023's reported ₹7,465 crore loss.
- **Attacks on Critical Information Infrastructure (CII):** India's power grids, telecom networks, transport systems, and financial markets are becoming high-value targets for cyberattacks.
  - Disruption of critical infrastructure can have cascading effects on public order, economic stability, and national security.
    - The increasing interconnection of operational technology (OT) with IT systems has expanded the attack surface. **Such threats blur the line between cybercrime and cyber warfare.**
  - For instance, in **October 2020**, a malware attack linked to foreign actors affected **Mumbai's power grid**, causing widespread outages and raising alarms about cyber-physical attacks.
- **Advanced Persistent Threats (APTs) and State-Sponsored Espionage**: APTs involve long-term, stealthy cyber intrusions aimed at espionage rather than immediate damage.
  - India faces growing risks of **cyber-espionage** targeting defence establishments, research institutions, strategic industries, and government databases.
  - These attacks are **often difficult to attribute and detect, allowing adversaries to siphon sensitive information** over extended periods. APTs reflect the geo-politicisation of cyberspace.
    - In 2025, **Maharashtra Cyber** reportedly **identified seven Advanced Persistent Threat (APT) groups** that carried out **over 15 lakh cyber attacks on critical infrastructure websites across India** in the aftermath of the Pahalgam terror strike.
- **Internet of Things (IoT) and Identity-Based Threats:** The rapid proliferation of IoT devices—**smart meters, cameras, medical devices, and industrial sensors**, has expanded India's cyber threat surface. Many devices lack basic security features such as regular updates or strong authentication.
  - Simultaneously, **identity theft and synthetic identities are being used to bypass authentication systems, enabling fraud and unauthorised access**. These threats challenge conventional perimeter-based security models.
  - For instance, compromised **CCTV cameras and routers** in Indian cities have been used to form botnets for DDoS attacks.

What Steps Has India Taken to Address Rising Cyber Threats?

- **Institutional Strengthening - I4C and "Pratibimb" Deployment:** The Indian Cyber Crime Coordination Centre (I4C) has been elevated to an **"attached office"** of the MHA to wage a data-driven war against the **"Jamtara Model" of organized fraud.**
  - By deploying the **"Pratibimb"** software, the state now maps the geospatial **location of active SIMs used by cybercriminals in real-time**, enabling physical raids rather than just digital blocks.
  - The **Pratibimb module** has significantly strengthened cybercrime enforcement by helping arrest **over 6,000 accused**, uncover **17,000+ criminal linkages**, and assist in **36,000+ cyber investigations** across India.
- **Strategic Indigenization- Project "Maya" and "Chakravyuh":** To eliminate **"backdoor"**

vulnerabilities in foreign software, the Defense Ministry has replaced Microsoft Windows with the indigenous "Maya OS" (based on Ubuntu) across all internet-facing defense terminals.

- This is fortified with **"Chakravyuh,"** a specialized endpoint detection system designed to create a deceptive layer that traps lateral movement by **APT (Advanced Persistent Threat) groups.**

- **Regulatory "Teeth"- CERT-In's 6-Hour Reporting Mandate:** The government has mandated that **all service providers and data centres report cyber incidents to CERT-In within six hours of detection.**.
  - In 2025, **CERT-In handled over 29.44 lakh cyber incidents**, issuing 1,530 alerts, 390 vulnerability notes, and 65 advisories, reflecting large-scale national cyber response capability.
- **Supply Chain Hygiene- "Trusted Telecom Portal" & NCRF:** Recognizing hardware as a Trojan horse, the government activated the **"Trusted Telecom Portal"** which bans telecom operators from sourcing gear from **"non-trusted" nations (primarily targeting Chinese OEMs).**
  - Simultaneously, the National Cyber Security Reference Framework (NCRF 2024) has been finalized to guide critical sectors.
  - For instance, **the National Critical Information Infrastructure Protection Centre (NCIIPC)** now actively audits **key critical sectors** (like Power).
    - **Further, BSNL's 4G rollout** is completely compliant with the "Trusted Source" norms.
- **Citizen-Centric Firewalls- "Sanchar Saathi" and "Chakshu" :** The launch of **"Sanchar Saathi"** has democratized threat intelligence by **allowing citizens to identify and disconnect unknown mobile connections registered in their name**.
  - This was bolstered by the **"Chakshu" facility (2024),** which crowdsources data on suspected fraud communications (calls/WhatsApp), feeding directly into a centralized AI engine that blacklists repeat offenders across all telecom operators instantly.
  - For instance, under Sanchar Saathi, as of December 2025, **over 42 lakh stolen/lost mobile devices have been successfully blocked**.
- **Promotion of "Cyber Hygiene"- Cyber Swachhta Kendra (CSK):** To counter the "silent" threat of botnets (zombie devices used for DDoS attacks), the government operates the **Botnet Cleaning and Malware Analysis Centre**.
  - This facility detects infected devices across ISP networks and provides free **"cleaning tools"** to citizens, actively reducing the nation's **"attack surface"** by sanitizing compromised consumer electronics without user intervention.
- **Future-Proofing Sovereignty-"Bharat 6G Alliance":** Learning from the 5G experience, India is aggressively actively shaping **6G standards** now to ensure future networks are **"Secure by Design"** rather than dependent on foreign proprietary tech.
  - The **goal is to own the intellectual property (IP)** for security protocols, ensuring that the next generation of critical telecom infrastructure is immune to foreign "kill switches" or surveillance backdoors.
  - **Bharat 6G Vision** targets **10% of global 6G patents** by 2030 to control security standards.
    - Further, based on India's contributions, the **ITU 6G Framework now includes 'Ubiquitous Connectivity' as one of the six usage scenarios of 6G** and also includes coverage, interoperability and sustainability as capabilities of 6G technology.
- **Legislative Deterrence-Digital Personal Data Protection (DPDP) Act, 2023 :**Moving from **"guidelines" to "statutory liability,"** this Act fundamentally alters the corporate security culture by imposing a **"cost on negligence."**
  - It mandates that **companies (Data Fiduciaries) i**mplement robust encryption and safeguards not just for compliance but to avoid crippling financial penalties, effectively making cybersecurity a boardroom priority rather than just an IT concern.
    - For instance, the **highest penalty up to ₹250 crore applies to failure of a Data Fiduciary** to maintain reasonable security safeguards.

- Together, these **provisions position India as a serious stakeholder in the global cyber governance framework**, signalling a shift towards accountability-driven data protection standards.

Global Cyber Governance Framework

- **The Legal & Treaty Framework (Hard Law):** The legal landscape is divided between two major treaties:
  - **Feature**
  - **Budapest Convention**
  - **UN Cybercrime Convention**
  - **Origin**
    - Council of Europe
    - United Nations
- **Focus**
  - Procedural powers for cross-border data access to fight cybercrime.
  - Emphasises prevention and international cooperation in electronic evidence sharing.
- **Criticism**
  - Critics argue it enables invasive surveillance, lacks sufficient human rights protections. **(India is not a party)**
  - Critics argue that the treaty could enable "cyber authoritarianism". **(India has not signed it).**
  - **The Tallinn Manual (2.0):** While not a treaty, this academic manual interprets how existing laws of war apply to cyber operations (e.g., when does a hack become an "armed attack" justifying self-defense?).
- **The Multi-stakeholder Normative Track (Soft Power):** Because the private sector owns the majority of the internet infrastructure, governments cannot govern alone. This track involves "Soft Law" voluntary agreements that include tech giants (Microsoft, Google) and civil society.
  - **The Paris Call for Trust and Security (2018):** It is a declaration that calls for states, the private sector, and organizations in civil society (groups that are not associated with government or the private sector) to work together to promote security in cyberspace, fight disinformation and address new threats that put citizens and infrastructure in danger.
  - **The Christchurch Call:** Focused specifically on eliminating terrorist and violent extremist content online (born after the 2019 NZ mosque shootings).
  - **Cybersecurity Tech Accord:** It promotes a safer online world by fostering collaboration among global technology companies committed to protecting their customers and users and helping them defend against malicious threats.
- **Related Concerns:**
  - **Rise of Polycentrism:** Weakening multilateral institutions, such as reduced U.S. funding to the UN, Security Council paralysis, and the **World Trade Organization** dispute system breakdown have **pushed cyber governance towards a polycentric order.**
    - This relies on overlapping bilateral and plurilateral arrangements, increasing complexity and stretching state capacity.
  - **Data Sovereignty and Cross-Border Data Flows:** While there is consensus on data sharing among trusted partners, there is no agreed global mechanism to operationalise it without compromising sovereignty.
  - **State-Sponsored Cyber Espionage:** Major powers increasingly use cyber tools for espionage and influence operations, blurring the line between crime, warfare, and national security.
    - For instance, Russia was alleged to have interfered in the 2016 United States presidential elections.

What are the Key Issues Associated with India's Cyber Security Architecture?

- **Institutional Fragmentation & "Siloed" Command:** The architecture suffers from a lack of a unified **"Cyber Command,"** with responsibilities split across multiple agencies **(CERT-In, NCIIPC, NTRO) that often operate in silos.**
  - This overlapping jurisdiction without a single executive authority creates critical delays in attribution and coordinated response during large-scale state-sponsored attacks, **leaving the "golden hour" of mitigation lost to bureaucratic coordination.**
- **The "Hardware Sovereignty" Gap (Supply Chain Risk):** India's critical infrastructure remains dangerously reliant on foreign-sourced hardware (semiconductors, routers, CCTV), creating **"Trojan Horse" risks** where embedded backdoors can bypass software firewalls.
  - This dependency means that **even with indigenous OS like "Maya," the underlying physical layer remains susceptible** to foreign **"kill switches**" activated during geopolitical tensions.
  - For instance, India leads the world in Telecom Equipment imports with 47,974 shipments. And, foreign-manufactured **IoT components represent a significant risk to critical sectors of the nation**.
- **Critical Infrastructure "Air-Gap" Fallacy:** Vital sectors like **Power and Railways rely on outdated Operational Technology (OT)** that was never designed for internet connectivity but is now being recklessly digitized.
  - This **convergence of IT and OT exposes undefended legacy systems to modern ransomware,** as operators falsely believe they are safe behind **"air-gaps" (offline networks)** which are easily breached via vendor maintenance laptops.
  - For example, **Oil India Ltd (Assam)** suffered a **ransom demand** cyberattack (2022) that halted operations.
- **The "Skill-Gap" & AI-Driven Asymmetry:** Despite being a global IT hub, India suffers a severe deficit of niche **"Blue Team" (defenders) and "Red Team" (offensive) strategists,** leaving networks vulnerable to automated AI-attacks.
  - The current workforce is **trained in general IT support, not in combating sophisticated, AI-generated polymorphic malware** that evolves faster than human defenders can patch.
  - For instance, there are **currently 25,000 to 30,000 active openings for cybersecurity roles across India**, indicating the level of skill gap.
- **The "Mule Account" Economy & Financial Fraud:** The explosive growth of digital payments has outpaced digital literacy, creating a massive ecosystem of **"rented" bank accounts used to launder fraud money.**
  - The issue is not just technical hacking but a socio-economic failure where thousands of citizens knowingly or unknowingly **"lease" their identities to cyber syndicates, making money trails nearly impossible to trace.**
  - Although **MuleHunter.AI** was developed by the **Reserve Bank Innovation Hub** to **identify mule accounts** used in money laundering and digital fraud, **its rollout has been slow**.
- **Geopolitical "Attribution" Crisis and Diplomatic Limbo:** India lacks a formal, **transparent Cyber Attribution Policy**.
  - Unlike the US or UK, which have established frameworks for **"naming and shaming" or issuing joint diplomatic statements on state-sponsored actors, India generall**y maintains a **policy of "strategic silence".**
  - Without a **standardized evidentiary framework** to publicize findings, India remains **stuck in a "gray zone"** where sophisticated actors from neighboring **states can paralyze infrastructure with plausible deniability,** knowing that India's response will likely be limited to domestic "patches" rather than diplomatic or strategic retaliation.
- **Deep Fake Hyper-Personalization and "Trust Erosion":** The architecture is **failing to keep pace**

with **"Social Engineering 2.0,"** where Generative AI is used to create hyper-personalized deepfakes for **"Digital Arrest"** scams and corporate identity theft.

- The current defensive focus is on securing **"networks,"** but it is defenseless against the manipulation of **"human trust,"** as current laws like the IT Act are sluggish to address the velocity of AI-generated misinformation that can trigger market volatility or social unrest in minutes.
- For instance, **Delhi Police arrested eight individuals** across three states in a case involving the alleged duping of an elderly NRI couple, who were reportedly defrauded of **over ₹14 crore through a 'digital arrest' scam**, with links traced to operators in **Cambodia and Nepal.**

What Measures are Needed To Strengthen India's Cyber Security Architecture?

- **Build Deep Technical and Institutional Capacity**: India must invest in advanced expertise in **cyber law, digital forensics, AI governance, and cross-border data regulation by creating specialised cadres within government.**
  - **Continuous upskilling of police, prosecutors, regulators, and diplomats** is essential to bridge the gap between technology and policy making. Without such capacity, India risks remaining a rule-taker in global cyber governance.
- **Strengthen Public–Private Partnerships:** Since most digital infrastructure is privately owned, India needs structured and trust-based public–private partnerships for cyber threat intelligence sharing.
  - **Joint cyber drills, legal safe-harbours, and clear liability frameworks** can improve real-time response to cybercrime. Such collaboration is crucial to tackle ransomware, financial fraud, and platform-based crimes.
- **Undertake Urgent Domestic Regulatory and Administrative Reforms:** India must streamline overlapping **cyber institutions, clarify mandates, and improve coordination among agencies.**
  - Stronger enforcement of data protection rules, faster cybercrime investigation procedures, and constitutionally aligned AI regulation are needed. Administrative effectiveness, not just new laws, will determine cybersecurity outcomes.
- **Prepare Institutionally for Polycentric Global Governance:** With declining multilateral consensus, cyber governance will increasingly operate through bilateral, plurilateral, and sector-specific arrangements.
  - India must develop the capacity to engage across multiple forums simultaneously while safeguarding strategic autonomy. Institutional agility will be critical in managing this complexity.
- **Integrate Cybersecurity with National Security Planning:** Cybersecurity should be treated as a core pillar of national security alongside defence and economic security.
  - Integrating **cyber threat assessments into strategic and military planning will improve preparedness against state-sponsored cyber espionage** and hybrid warfare. This reflects the reality of cyberspace as a continuous conflict domain.
- **Prioritise Protection of Critical Information Infrastructure:** India must accelerate efforts to secure power grids, telecom networks, financial systems, and transport infrastructure.
  - Regular **stress testing, red-teaming exercises, and mandatory security standards** for critical sectors are essential. Disruption of such infrastructure can have cascading national consequences.
- **Enhance International Cooperation Without Compromising Sovereignty:** India should deepen cooperation on cybercrime investigation, digital evidence sharing, and capacity building while retaining control over data and regulatory choices.
  - Selective engagement **with trusted partners can deliver practical outcomes even in the absence of global consensus**. Strategic flexibility is preferable to rigid alignment.

- **Strengthen Human Rights and Procedural Safeguards**: Cybersecurity measures must be balanced with due process, privacy, and freedom of expression.
  - **Clear judicial oversight, proportional enforcement, and transparency in surveillance** will enhance democratic legitimacy. This also strengthens India's credibility in global digital governance debates.
- **Invest in Cyber Awareness and Digital Literacy:** Reducing cyber risks requires empowering citizens through large-scale digital literacy and cyber hygiene programmes.
  - **Awareness of phishing, financial fraud, and data misuse** can significantly reduce attack success rates. Human resilience remains the first line of cyber defence.

Conclusion:

In an era of AI-driven threats and fragmented global cyber governance, cybersecurity has become central to India's strategic autonomy. **While India has taken notable institutional, legal, and technological measures, systemic gaps in capacity, coordination, and skills persist**. The emerging polycentric global order demands that India simultaneously strengthen domestic cyber resilience and engage multilaterally with agility. Ultimately, **India's ability to secure cyberspace will shape its national security, economic stability, and global digital leadership.**

India–EU FTA and Strategic Realignment

This editorial is based on "India-EU ties: Stagnation to strategic realignment" which was published in The Hindustan times on 27/01/2026. The article examines the transformation of India–EU relations from prolonged stagnation to strategic realignment. It highlights how the India–EU FTA and deeper cooperation in trade, technology, security, and sustainability position the partnership as a key pillar of the emerging multipolar order.

In a world marked by fractured supply chains, sanctions, politics, and sharpening great-power rivalry, India and the European Union have taken a decisive geopolitical step by **signing the India–EU Free Trade Agreement.** With bilateral trade at **$136 billion**, the EU contributing **16% of India's FDI**, and the FTA expected to unlock **$75 billion in additional exports**, economic integration is now reinforcing strategic alignment. For Europe, the agreement enables diversification away from China and the US and **for India, it secures access to the world's largest single market**. Together, the two partners are positioning themselves as anchors of stability in an emerging multipolar, rules-based global order.

How India-EU Ties have Evolved Over Time?

- **Phase I: Normative Engagement (1990s–2004)**
  - Post–Cold War reorientation led to economic and political engagement driven by trade, development assistance, and shared democratic values, culminating in the **Strategic Partnership in 2004**.
- **Phase II: Institutional Optimism, Limited Convergence (2005–2013)**
  - The **Joint Action Plan (2005)** and **Broad-based Trade and Investment Agreement (BTIA) talks (2007)** expanded dialogue architecture, but progress stalled due to Eurozone crises, regulatory divergence, and lack of political push,revealing a gap between ambition and delivery.
- **Phase III: Strategic Drift amid Global Uncertainty (2014–2019)**
  - Despite growing trade, ties remained under-leveraged as **Europe turned inward and India diversified partnerships**; the relationship remained economically transactional and geopolitically underdeveloped.
- **Phase IV: Strategic Recalibration (2020–2024)**
  - Covid-19, supply-chain shocks, and China's assertiveness triggered convergence on resilience, technology, and the Indo-Pacific, leading to **revival of trade talks and the Trade and Technology Council (2022)**.

- Both sides began **reassessing the FTA not merely as a commercial instrument but as a tool for resilience**, diversification, and strategic autonomy.

Phase V: Strategic Consolidation (2025–present)

- The **signing of the India–EU FTA**, security and defence partnership, and mobility frameworks mark a shift from sectoral cooperation to comprehensive strategic alignment, positioning India and the EU as co-architects of a stable multipolar order.

What are the Key Provisions of the INDIA-EU FTA?

- **Unprecedented Tariff Liberalisation in Goods Trade:** Preferential access for **over 99% of India's exports (by value)** to the EU.
  - Immediate zero-duty access for a large share of **labour-intensive sectors**.
  - Phased tariff elimination and calibrated tariff reductions for select sensitive products.
  - Use of **Tariff Rate Quotas (TRQs)** for automobiles, steel, select agri and marine products to balance market access with domestic protection.
- **Calibrated Reciprocal Market Access for EU Exports:** India offers tariff concessions on **92.1% of tariff lines** covering **97.5% of EU exports**.
  - Gradual tariff elimination over **5–10 years** for sensitive industrial goods.
  - Controlled liberalisation in agriculture through TRQs for limited fruit categories.
  - Facilitates access to **high-technology EU inputs**, lowering production costs and enhancing competitiveness of Indian industry.
- **Product-Specific Rules of Origin (PSRs):** Clearly defined origin criteria ensuring substantial processing within India or the EU.
  - Alignment with existing global value chains to prevent trade deflection.
  - Flexibility for sourcing non-originating inputs, particularly benefiting MSMEs.
  - Provision for self-certification (Statement of Origin) to reduce compliance costs.
- **Safeguarded Agricultural Liberalisation**
  - The EU has committed to providing **favourable and preferential market access** to Indian agricultural and processed food exports.
    - This includes key products such as **tea, coffee, spices, fresh fruits and vegetables, and processed food items**, where India enjoys strong comparative advantage.
  - India has adopted a **cautious and calibrated approach** in agriculture by **not granting market access** to the EU in sensitive sectors.
    - These include **dairy, cereals, poultry, soymeal, and certain fruits and vegetables**, which are critical for domestic food security, farmer livelihoods, and rural employment.
- **Services Trade: High-Value Commitments**
  - The EU has undertaken **commercially meaningful and predictable commitments** in the services sector by opening **144 services sub sectors** to Indian service suppliers.
    - These include key areas such as **IT and IT-enabled services, professional services, other business services, and education services**. The EU has also assured **non-discriminatory treatment and regulatory certainty**.
  - India has committed to opening **102 services subsectors** to EU service providers under the FTA.
    - These commitments aim to facilitate the entry of **high-technology services, investment, and global best practices** from the EU into the Indian economy.
- **Mobility & Movement of Professionals**
  - The EU has agreed to a **facilitative and predictable mobility framework** covering multiple categories of professionals.
    - This includes access for **Intra-Corporate Transferees (ICTs)** and **business visitors**, along with commitments in **37 sectors for Contractual Service Suppliers (CSS)** and **17 sectors for Independent Professionals (IP)**.

- Moreover the EU has extended **entry and working rights to dependents and family members of ICTs**, as well as provisions supporting **student mobility and post-study work opportunities**.
- Also, in EU member states where regulations do not exist, AYUSH practitioners will be able to provide their services based on professional qualifications earned in India
- The FTA establishes a predictable and facilitative framework for business mobility, covering **short-term, temporary, and business travel in both directions.**
  - Additionally, India has secured a framework for **constructive engagement on Social Security Agreements over a five-year horizon**, aimed at reducing the burden of double social security contributions and facilitating smoother professional mobility between the two regions.

- **Non-Tariff Barriers & Trade Facilitation**
  - The EU has committed to reducing non-tariff barriers through enhanced **regulatory transparency**, simplified customs procedures, and improved **Sanitary and Phytosanitary (SPS)** measures.
    - These steps aim to address procedural and compliance challenges faced by Indian exporters, particularly in agriculture, food, and manufactured goods.
  - India has agreed to strengthen cooperation on **customs, trade facilitation, SPS, and Technical Barriers to Trade (TBT)** disciplines.
- **CBAM & Climate-Trade Interface**
  - Under the FTA, the EU has provided **forward-looking assurances** related to the Carbon Border Adjustment Mechanism (CBAM).
    - The agreement provides India with a Most-Favoured-Nation **assurance,** under which any flexibilities accorded by the EU to third countries under the Carbon Border Adjustment Mechanism will be applicable to India.
  - India has agreed to **constructive engagement and dialogue** on CBAM-related issues while safeguarding its development priorities.
    - Through cooperation rather than coercion, **India seeks to align climate action with trade competitiveness,** ensuring that environmental standards do not become disguised trade barriers.

KEY FTA GAINS BY SECTOR

SECTOR	KEY FTA GAIN
Agriculture & Processed Foods	Preferential access for tea, coffee, spices, fruits, vegetables, meat, safeguards for sensitive items like dairy.
Engineering Goods	Tariff cuts (up to 22%) on engineering exports
Labour-Intensive Industries	Tariff elimination
Leather & Footwear	Zero-duty access (from up to 17%) across all tariff lines
Marine Products	Tariff reduction up to 26% covering 100% trade value
Medical Devices & Instruments	Duty-free access on 99% of tariff lines
Gems & Jewellery	Full preferential access (earlier tariffs up to 4%)
Textiles & Apparel	Zero-duty access (tariffs up to 12% removed)
Plastics & Rubber	Preferential access to EU's large import market
Chemicals	Zero duty on 97.5% of export value
Mines & Minerals	Zero duty on 100% tariff lines
Furniture & Home Décor	Reduced duties (up to 10.5%)

Note: Under the India–EU FTA, **tariffs on car imports into India** will gradually reduce from 110% to 10% under an annual quota of 250,000 vehicles, while **electric vehicles remain excluded from tariff relief.**

- This move is expected to benefit European automakers, which currently hold less than 4% of India's car market, and may attract fresh investments.
- However, there are **concerns that early tariff cuts could hinder the growth of India's domestic automobile industrie**s before they achieve global competitiveness, potentially affecting local manufacturers and the emerging EV ecosystem.

What are the Other Areas of Convergence in India-EU Relations?

- **Strategic Autonomy & Multipolar World Order:** India and the EU **converge on resisting bloc politics** and preserving strategic autonomy amid US–China rivalry.
  - Both **prefer issue-based coalitions, sovereignty, and flexibility** over alliance entanglements.
    - This alignment positions them as **stabilising middle powers shaping a multipolar order** rather than followers of great-power binaries.
  - The **Joint India-European Union Comprehensive Strategic Agenda** reaffirmed commitment to prosperity and sustainability. EU leaders were chief guests at India's **77th Republic Day**, signalling political recalibration.
- **Defence, Maritime Security & Indo-Pacific Stability:** Security convergence has deepened as both face disruptions to **sea lanes, cyber threats, and grey-zone coercion in the Indo-Pacific.**
  - **India brings regional presence and naval capability**, while the EU contributes capacity-building and maritime domain awareness. Security cooperation now complements economic engagement.
  - The **Security and Defence Partnership (SDP)** expands cooperation in maritime security, cyber-defence, and counter-terrorism and joint naval exercises.
- **Supply Chain Resilience & De-Risking from China:** Both India and the EU seek to reduce overdependence on concentrated manufacturing hubs, **especially China**, without abrupt decoupling.
  - **India offers scale, demographics, and manufacturing potential,** while the EU provides capital, technology, and standards. This convergence is driven by risk management rather than ideology.
  - EU leaders have framed India as a **trusted partner** for diversification. For instance, EU firms account for **16% of total FDI** into India with over **6,000 companies** operating locally.
    - European Commission President **Ursula von der Leyen** has strongly endorsed the sentiment that a **growing India benefits the world.** Specifically, during the finalization of a major EU-India trade deal, she stated: **"When India succeeds, the world is more stable, more prosperous and more secure, and we all benefit"**.
- **Technology Governance & Trusted Digital Ecosystems:** India and the EU converge on the need for democratic governance of technology—balancing innovation with regulation.
  - Unlike the US's market-led approach or China's state-centric model, **both favour rules-based digital ecosystems. Cooperation spans AI, semiconductors, cyber norms, and digital public infrastructure.**
  - The **India–EU Trade and Technology Council (2022)** institutionalised cooperation on **trusted tech, supply chains, and green technologies;** multiple TTC working groups are now operational.
- **Multilateralism & Global Governance Reform:** India and the EU converge in **defending multilateral institutions at a time of fragmentation, sanctions politics, and rule erosion**. Both see r**eformed multilateralism—not unilateralism**—as essential for global stability. India's rise and EU's normative weight are increasingly complementary.

- **Data/Example:**
  - India and EU coordinate positions in forums like G20, **WTO reform debates, and climate negotiations**.

What are the Key Areas of Divergence in India-EU Relations?

- **"Green Protectionism"-The CBAM Deadlock:** The primary economic friction is the EU's **Carbon Border Adjustment Mechanism (CBAM)**, which India views as a discriminatory "green tax" disguised as climate action.
  - India argues this unilateral levy penalizes its developing industrial base **by ignoring "Common But Differentiated Responsibilities" (CBDR)**, effectively neutralizing the tariff benefits gained under the new FTA by adding a 20-35% cost layer to exports.
  - While the recent India–EU FTA signals progress through an MFN clause on CBAM-related flexibilities, **its practical effectiveness in shielding Indian exports remains uncertain**.
- **Geopolitical Dissonance- The "Russia-Ukraine" Litmus Test:** A sharp strategic divide persists over the **Russia-Ukraine conflict**, where the EU demands alignment on sanctions as a **"values-based" prerequisite**, while India maintains **"Strategic Autonomy."**
  - The **EU views India's purchase of Russian oil as indirectly funding the war** against Europe, whereas **India frames it as a non-negotiable energy security imperative for its 1.4 billion population,** creating a permanent diplomatic irritant.
  - India was the third highest buyer of Russian fossil fuels, importing a total of €2.3 billion of Russian hydrocarbons in December 2025 (CREA), while the EU urged tighter sanctions.
    - Further, India abstained on **key UN resolutions** criticizing Russia, diverging from the **EU's unified block vote**.
- **Digital Sovereignty-GDPR vs. DPDP Act Alignment:** While the EU considers its **General Data Protection Regulation** the "gold standard" for data adequacy, **India's Digital Personal Data Protection (DPDP) Act, 2023,** prioritizes government access for national security, creating a fundamental "**adequacy gap.**"
  - The EU is **hesitant to grant India "Data Secure" status**, crucial for high-value IT outsourcing, citing the lack of an independent regulator (India's Data Protection Board is government-appointed) and broad state surveillance exemptions.
  - EU-India data cooperation is currently hindered by concerns over the broad exemptions granted to government agencies under Section 17 of **India's DPDP Act, 2023.**
    - This forces Indian IT firms to use costly **Standard Contractual Clauses (SCCs)**, adding **to their compliance costs** for EU clients compared to the Philippines or Vietnam.
- **Mobility Asymmetry- "Fortress Europe" vs. "Talent Export":** While the EU seeks **"circular migration" (temporary entry)** strictly to fill its aging workforce gaps, India demands permanent and **easier "Mode 4" access** (movement of professionals) for its IT and healthcare workers.
  - The divergence lies in the **EU's security-centric approach prioritizing the return of "illegal migrants" versus India's economic approach,** which views restrictive visa regimes and non-recognition of Indian degrees as a primary trade barrier.
  - While the EU sets no official cap on Blue Cards, **the 2026 mobility pact guarantees a minimum of 35,000 graduate permits against an annual target of 100,000 multi-year work visas for Indians.**
    - This guaranteed floor remains significantly **below India's vast supply of millions of graduates, creating a competitive bottleneck** for those seeking formal entry.
- **WTO Subsidy Wars- "Public Stockholding" Conflict:** At the WTO, **the EU alongside other developed nations like the US, aggressively challenges India's Minimum Support Price (MSP)** and food grain procurement **as "trade-distorting"** subsidies that

breach the 10% limit, while simultaneously **shielding its own farmers with massive "Green Box" (non-trade distorting) subsidies.**

- For instance, at recent preparatory meetings for the **14th WTO Ministerial Conference (MC14) to be held in March 2026,** the EU has proposed introducing "responsible consensus", diluting the **Most-Favoured-Nation (MFN) principle, restricting Special and Differential Treatment (S&DT)** for developing countries, and deferring the restoration of a robust dispute settlement mechanism until core WTO reforms are completed.
  - It is an approach that conflicts with India's stance, **which strongly supports the revival of a fair and effective multilateral dispute settlement system** to safeguard developing-country interests.

What Measures are Needed to Enhance India-EU Cooperation?

- **Establishing a "Green Equivalence" Framework for CBAM:** To defuse the carbon tax tension, both sides should negotiate a "**Sovereign Carbon Credit Reciprocity"** agreement where India's domestic "Carbon Credit Trading Scheme" (CCTS)" is technically harmonized with the EU's ETS.
  - **By validating Indian carbon certificates as "equivalent offsets" at the source, exporters can pay the carbon price domestically** rather than to Brussels, ensuring the revenue remains within India for green transition funding while satisfying the EU's requirement for a level playing field.
- **Creating "GDPR-Aligned Data Enclaves" (Regulatory Sandboxes):** To bypass the deadlock on national data adequacy, India should designate specific **Special Economic Zones (like GIFT City)** as **"Data Adequacy Islands"** that operate under stricter, GDPR-equivalent privacy norms independent of broader state surveillance laws.
  - This **"zonal adequacy" approach allows high-value data processing for EU clients** to continue seamlessly within these ring-fenced enclaves, decoupling commercial data flow needs from the complex national security debates surrounding the DPDP Act.
- **Operationalizing "Third-Market Co-Creation" in the Global South:** To dilute the bilateral geopolitical fixation on Russia, the partnership should pivot to a **"Joint Infrastructure Platform" for Africa and the Indo-Pacific,** combining EU capital (Global Gateway) with India's cost-effective execution capabilities.
  - This **"Strategic De-hyphenation"** focuses energy on shared constructive goals like building **resilient power grids in Kenya or digital payment systems in Vietnam** creating a functional success track that insulates the broader relationship from specific diplomatic disagreements.
- **A "Critical Raw Materials Club" with Value-Addition Guarantees:** Rather than the EU simply extracting resources, a **"Co-dependency Compact"** should be signed where the EU transfers advanced metallurgical processing technology to India in exchange for secured lithium or rare earth supplies.
  - This moves the relationship **beyond a "buyer-seller" dynamic to a "joint-processor" alliance,** ensuring India captures the high-value intermediate manufacturing stage while the EU secures a diversified supply chain free from Chinese monopoly.
- **Establishing "India-EU Innovation Hubs" for Critical Technologies:** As outlined in the **Joint India-EU Comprehensive Strategic Agenda**, both sides should operationalize dedicated "Innovation Hubs" to facilitate the co-development of critical and emerging technologies like **6G, Quantum Computing, and Advanced Semiconductors**.
  - This measure moves beyond simple **"technology transfer" to a "co-creation" model where Indian design strengths (in AI and chip prototyping)** are integrated with European research infrastructure, effectively building a democratic tech supply chain that serves as a resilient alternative to monopolistic global actors.

Conclusion:

The India–EU partnership is evolving from episodic engagement to **strategic convergence**, anchored in **multipolarity, strategic autonomy, and rules-based order**. The FTA acts as a catalyst, but the relationship now spans **security, technology, climate governance, and human capital**. Managing divergences through dialogue rather than coercion will be critical. Together, India and the EU can emerge as **pillars of stability in a fractured global system**.

Transforming India'S E-Commerce Sector

This editorial is based on "E-commerce promise for a Viksit Bharat" which was published in The Financial Express on 24/01/2026. The editorial examines how India's rapidly expanding e-commerce sector can become a cornerstone of Viksit Bharat by balancing innovation, competition, and inclusion. It argues for calibrated regulation that protects fair play and consumer trust while empowering MSMEs, boosting exports, and sustaining digital-led growth.

India's e-commerce sector has emerged as a **key driver of India's digital and consumption-led growth**, expanding far beyond urban markets into tier-II and III cities. Valued at about **$125 billion in 2024**, it is projected to reach **$345 billion by 2030**, supported by rising internet penetration, smartphone adoption, and seamless digital payments. **UPI's massive transaction volumes** have embedded online commerce into everyday economic life, empowering MSMEs and small sellers. Together, e-commerce now anchors **jobs, exports, logistics, and innovation**, making it central to India's vision of a **Viksit Bharat**.

What are the Key Drivers of E-Commerce in India?

- **Digital Payments And UPI As The Transactional Backbone: Rapid, low-cost, real-time payments** have fundamentally lowered friction for online transactions and enabled seamless person-to-merchant flows transforming consumer behaviour, seller onboarding and working capital cycles.
  - UPI's ubiquity **compresses settlement times, reduces dependency on cash, and enables micro-transactions** that make low-value digital commerce viable in smaller towns.
  - For instance, UPI processed **over 20 billion transactions** in **August 2025** worth **₹24.85 lakh crore** in that month, underlining its scale as payments infrastructure.
- **Internet And Smartphone Penetration Driving Demand:** Growing internet users and falling device costs have **expanded the addressable market from metros to rural India,** changing both demand composition and preferred formats (**short video, vernacular, mobile first).**
  - This democratisation **raises average order frequency and brings new cohorts (rural, older, lower-ARPU) into digital retail,** forcing platforms to localise UX, logistics and payments.
    - Strong network upgrades **(4G, 5G & 6G push)** further enable richer experiences (video commerce, livestreaming).
  - India has **over 800 million internet users** entering 2025 and **85.5% households** are with at least one smartphone as per "Comprehensive Modular Survey: Telecom, 2025" .
- **Logistics, Last-Mile Networks And Cold-Chain Maturation:** Efficient logistics and hyperlocal fulfilment convert digital demand into **reliable consumer experience.**
  - Investments in warehousing, **route optimisation and dark stores** reduce lead times and returns. Logistics scale enables category expansion (fresh groceries, pharmaceuticals) and lowers repeat purchase friction.
  - For instance, Quick Commerce captured **nearly two-thirds of e-grocery orders in 2024** and grew over **$6 billion** market, demonstrating rapid fulfillment-led adoption.
- **MSME Integration, ONDC And Platform Democratization:** E-commerce platforms **lower market access costs for micro and small sellers (eg, About 70% of e-commerce sales in India are attributed to MSMEs),** spurring product diversity and geographic reach.

- Public digital infrastructure (ONDC) and **interoperable networks** aim to decentralise discovery and **reduce winner-takes-most dynamics,** potentially lowering entry barriers and enabling more local sellers to compete.
- For instance, ONDC reported **1.16 lakh+ retail sellers live** across **630+ cities/towns** as of December 2025, indicating **real adoption of an open-network approach.**

- **Exports And Cross-Border E-Commerce Potential:** Digital platforms **convert local MSME capabilities (textiles, handicrafts, specialty foods) into global demand channels**.
  - Successful aggregator models increase seller discoverability overseas**. FTA developments and platform export programs create large multipliers for value-added exports.**
  - For instance,Since 2015, Amazon has enabled $20 billion in cumulative ecommerce exports from India, including through the Amazon Global Selling program. Further Amazon targets **$80 billion export by 2030**.
- **Generative AI, Analytics And Productivity Gains:** AI/ML i**mproves discovery, dynamic pricing, demand forecasting** and inventory optimisation raising gross merchandising productivity and reducing working capital strain for sellers.
  - **Personalisation, conversational commerce and automated customer support lower service costs** and increase conversion.
    - Adoption supports smaller merchants by automating catalogue creation, translations and targeted marketing.
  - Industry reports estimate **GenAI is transforming India's retail,** consumer, and e-commerce sectors, **driving 35%–37% productivity gains by 2030** through AI-powered growth & engagement, highlighting large efficiency upside.
- **Evolving Business Models:** Diverse models like **pure marketplaces, inventory-led vertically integrated retail, and quick commerce coexist**, each with trade-offs between **Customer Acquisition Cost (CAC),** margins and control over customer experience. Marketplaces scale assortment with lower capital intensity.
  - **Inventory models capture higher margin** but require heavy capex and inventory risk. **Quick commerce trades margin for time advantage**.
  - For instance, **Flipkart's re-domiciliation and IPO plans reflect maturation of inventory plus marketplace hybrids**, while quick commerce captured **nearly 10% of e-retail spending.**
- **Competition And Regulatory Environment**: Competition enforcement by CCI and judicial review are **shaping platform conduct, addressing preferential treatment, parity clauses and data advantages while preserving innovation incentives.**
  - For instance, in April 2025, the **CCI approved its first-of-its-kind settlement proposal** from Google in the Android TV case.
    - Google agreed to a settlement fee of ₹20.24 crore and committed to removing bundling requirements and allowing manufacturers to develop alternative Android-based devices.

How is the E-Commerce Sector Being Regulated in India?

- **Consumer Protection (E-Commerce) Rules, 2020:** Framed under the **Consumer Protection Act, 2019**, these rules are the primary shield for online shoppers. Key mandates include:
  - **Grievance Redressal:** Platforms must appoint a Grievance Officer and acknowledge complaints within 48 hours.
  - **Transparency:** E-commerce entities must clearly display the "Country of Origin," total price (including delivery and taxes), and refund/exchange policies.
  - **Prevention of Unfair Trade Practices:** The rules also prohibit unfair trade practices. E-commerce entities cannot publish misleading advertisements, offer fake discounts, or display false reviews.
  - **Consumer Data Protection & Fair Cancellation Norms:** Any data collection must be done with

explicit consumer consent, pre-ticked checkboxes are not allowed.
    - Furthermore, cancellation charges cannot be imposed on consumers unless the platform itself incurs similar costs in case of a cancellation.
- **FDI Policy & FEMA (Foreign Investment):** The **Department for Promotion of Industry and Internal Trade (DPIIT)** regulates how foreign-funded giants like Amazon and Flipkart operate:
  - **Marketplace vs. Inventory Model:** 100% FDI is allowed only in the **Marketplace model** (acting as a bridge between buyers and sellers). FDI is strictly prohibited in the **Inventory-based model** (where the platform owns the goods).
  - **Ownership Restrictions:** An e-commerce entity cannot sell products from a vendor in which it has an equity stake.
- **Data Privacy:** With the **Digital Personal Data Protection (DPDP) Act, 2023** now in effect, e-commerce companies face strict data handling rules:
  - **Explicit Consent:** Platforms must obtain clear, informed consent before collecting user data.
  - **Right to Deletion:** Users have the right to ask platforms to delete their personal data once the "purpose" (like a delivery) is fulfilled.
  - **Heavy Penalties:** Non-compliance can lead to fines of up to **₹250 crore** per instance.
- **Competition Commission of India (CCI):** The CCI acts as the "market watchdog" to prevent monopolies. It specifically monitors:
  - **Self-Preferencing:** Ensuring platforms don't give their own "private labels" better search visibility over third-party sellers.
  - **Exclusive Launches:** Preventing platforms from signing exclusive deals with brands **(like specific smartphone launches**) that shut out other competitors.

What Measures have been Taken by the Government to Boost e-Commerce in India ?

- ONDC **– Democratizing E-commerce:** ONDC shifts e-commerce from closed platforms to an open network, enabling kirana stores and MSMEs to access buyers across apps while reducing high commissions and algorithmic dependence.
  - For instance, **ONDC** recorded over **20.4 Crore transactions** as of March 2025 and onboarded **7.6 lakh sellers**,
- GeM**– Transforming Public Procurement:** GeM has revolutionised government procurement by enhancing transparency and inclusivity.
  - As on 23rd January, 2025, GeM has clocked a GMV of ₹4.09 Lakh Crore, which marks a growth of nearly 50% over the corresponding period last FY. It has onboarded 1.8 lakh women-led MSEs through "Womaniya" initiative.
- **E-Commerce Export Hubs under FTP 2023: ECEHs** near ports and airports provide fast-track customs and warehousing, easing compliance for small exporters and enabling single-item global shipments, **export consignment cap raised to ₹10 lakh.**
- **Last-Mile Logistics via India Post–ONDC Integration:** Integration of **India Post with ONDC leverages 1.6 lakh post offices to reduce rural delivery costs,** expanding digital commerce.
  - **India Post** delivered its first official ONDC order in **January 2026**.
- **Regulatory Trust through Dark Pattern Guidelines:** The Guidelines for Prevention and Regulation of Dark Patterns, 2023, notified on 30 November 2023, identify and prohibit 13 dark patterns including: **False Urgency, Basket Sneaking and Confirm Shaming.**
  - Further, the **proposed Digital India Act aims to replace the outdated IT Act of 2000,** establishing a future-ready, comprehensive legal framework to regulate India's evolving digital space.
- **Credit Line on UPI – Financial Inclusion:** Embedded pre-sanctioned credit lines in UPI enable instant credit at checkout, improving working capital for small sellers and boosting consumption in **Tier-2 and Tier-3 cities.**
- Bhashini **– Linguistic Inclusion in E-commerce:** Bhashini integration enables voice-based, multilingual e-commerce in 22 Indian languages,

empowering rural and vernacular users through conversational payments.

- For instance, the **Bhashini-enabled "Sahayak" bot** on ONDC supports 5 languages (Hindi, English, Marathi, Bangla, and Tamil).

- TEAM Scheme – **MSME Digital Onboarding:** TThe TEAM scheme, a sub-scheme of the centrally sponsored RAMP programme leverages Digital Public Infrastructure to digitally empower MSMEs, **aiming to onboard 5 lakh MSMEs onto ONDC by 2026, with 50% women beneficiaries.**

What are the Key Issues Associated with the e-Commerce Sector in India?

- **Antitrust & "Preferred Seller" Nexus:** The core structural issue is the platform-neutrality paradox, where giants like Amazon and Flipkart **allegedly prioritize their own inventory-holding "alpha sellers" over third-party merchants**.
  - This creates an uneven playing field where **ordinary sellers are reduced to "database entries,"** unable to compete against platform-backed entities that enjoy subsidized logistics and rigged search visibility.
  - **A CCI Investigation Report (2024)** confirmed that Amazon and Flipkart favored select sellers to control inventory.
    - The Digital Competition Bill is still pending which proposes penalties up to 10% of global turnover for such "self-preferencing" violations.
- **The "Quick Commerce" Safety & Labor Crisis:** The explosive rise of "10-minute delivery" models (Blinkit, Zepto) has **triggered a humanitarian and civic crisis**, prioritizing speed over human safety.
  - This **"pressure-cooker" model** forces gig workers to **violate traffic rules** to meet algorithmic deadlines, leading to a **surge in road accidents** and labor strikes, as platforms externalize the cost of "instant gratification" onto the worker's life and public safety.
  - For instance, **Traffic violations by delivery agents in Bangalore have doubled from 2023-2025,with 1.46 lakh cases registered.**
    - In response to these issues **Gig Workers' Unions** launched nationwide strikes in **Jan 2026**, a key demand was a **ban on the "under-10-minute" delivery promise due to rising fatalities**.
- **"Dark Patterns" & Algorithmic Manipulation:** E-commerce interfaces are increasingly weaponizing behavioral psychology through **"Dark Patterns" like false urgency ("Only 2 left!") and basket sneaking** to trap consumers into impulse buying.
  - These deceptive UX designs **subvert consumer autonomy, turning digital consent into a manipulated outcome**, which has forced the regulator to move from issuing "guidelines" to mandating strict "self-audits (**CCPA June 2025 Advisory)**."
    - Studies found **13 distinct dark patterns (e.g., "drip pricing"**) prevalent across **top travel and retail apps** in India.
- **The ONDC "Adoption-Viability" Gap:** While the Open Network for Digital Commerce (ONDC) aims to break the duopoly by democratizing digital access, it faces a **"cold start"** problem regarding dispute resolution and service consistency.
  - A LocalCircles survey revealed that **only 15% of e-commerce users had used ONDC to place an order in FY 2024–25** (as of May 2025).
    - **Also a different survey states that, over half of users (54%) find the platform cumbersome**, while **35% report weak customer support**, undermining user trust and repeat usage.
    - This indicates that **usability and service gaps, not value, are the key constraints on ONDC's effectiveness**.
- **Regulatory Overreach vs. Innovation Stifling:** The proposed **shift from "ex-post" (punishing after the crime) to "ex-ante" (preventative)** regulation **via the Digital Competition Bill** is creating a compliance **nightmare for startups.**
  - Industry bodies argue that designating successful Indian platforms as **"Systemically Significant Digital Enterprises" (SSDEs)** based on user thresholds could punish growth, forcing

domestic unicorns to slow down expansion to avoid being shackled by the same rules meant for global big tech.

- The **Internet and Mobile Association of India (IAMAI)** has also flagged concerns over the thresholds for the designation of SSDEs.

- **The "Inventory Masking" & FDI Norm Circumvention:** A persistent structural issue is the alleged circumvention of **"Press Note 3" (which tightened FDI scrutiny for e-commerce entities)** through complex webs of "**proxy sellers."**
  - By routing inventory through newly created shell entities, global giants continue to control pricing and engage in **"predatory discounting,"** which effectively annihilates the independent offline retail sector that cannot compete with subsidized losses.
  - For instance, the Confederation of All India Traders (CAIT) has alleged that quick-commerce platforms **engage in regulatory violations, including restricted market access, lack of transparency, FEMA breaches, and anti-competitive practices under the Competition Act, 2002**.
    - The white paper (by CAIT) flags that these strategies create an unfair playing field, making it nearly **impossible for the 30 million Kirana stores to compete.**
- **The "Reverse Logistics" Carbon Footprint Crisis:** The industry is grappling with a sustainability paradox where lenient "**no-questions-asked" return policies create a "Reverse Logistics" carbon bomb.**
  - This cycle doubles the transportation emissions for a single item and often results in **"open-box" goods being liquidated or landfilled rather than restocked,** directly contradicting **India's "LiFE" (Lifestyle for Environment) and Net-Zero commitments.**
  - For instance, in India, clothing return rates for online purchases are significantly higher, **often ranging between 25% and 40%.**
    - Reverse logistics (returns) creates a **"half-full truck" problem,** significantly **increasing the carbon footprint per successful sale**.
- **AI-Driven "Astroturfing" (Fake Review Farms):** Trust is eroding as Generative AI is now weaponized to run **"Review Farms"** that flood product pages with thousands of hyper-realistic, fake positive testimonials in minutes.
  - For instance, the Central Consumer Protection Authority has **issued over 450 class action notices and imposed penalties exceeding ₹2.13 crore**, including action against misleading advertisements and **dark patterns in digital markets**.
  - This **"Astroturfing" destroys the credibility of the "5-star" system** and misleads consumers into buying substandard goods, forcing regulators to move from **"voluntary standards"** to mandatory criminal liability for hosting bot-content.
- **The Crisis of Plastic Proliferation in E-Commerce:** The **excessive use of non-biodegradable, single-use plastics** for multi-layered packaging and protective padding (bubble wrap/tapes) creates a massive environmental footprint that bypasses traditional waste management.
  - While the **Plastic Waste Management Rules** mandate Extended Producer Responsibility (EPR), enforcement remains weak as platforms prioritize logistical safety and cost-efficiency over circular economy goals.
    - **India generates approximately 9.3 million tonnes of plastic waste annually,** and the rapid growth of e-commerce is exacerbating this problem.

What Measures are Needed to Strengthen the e-Commerce Sector in India?

- **Deepening "Sovereign Interoperability" via ONDC 2.0:** To dismantle the "walled gardens" of global platforms, the **Open Network for Digital Commerce (ONDC) must evolve into a "full-stack" public utility.**

- This involves integrating high-level AI-driven **cataloguing automation** and **real-time grievance redressal bots** directly into the protocol.
  - By standardizing these back-end services, the government **can lower the technical entry barrier for rural micro-enterprises,** allowing them to compete on service quality rather than just price, thereby creating a truly decentralized and competitive **"India-scale" marketplace.**
- **Implementing "Ex-Ante" Regulatory Guardrails for Fair Play:** Transitioning from **reactive (ex-post) to proactive (ex-ante) competition** regulation is vital to prevent **algorithmic self-preferencing** and predatory pricing by systemically significant platforms.
  - This measure requires mandating **"Platform Neutrality Audits"** where companies must prove that their search rankings are meritocratic and not biased toward their own **"alpha-sellers" or associated brands**.
  - Such transparency will safeguard the "Viksit Bharat" vision by ensuring that domestic startups and MSMEs are not structurally sidelined by deep-pocketed incumbents.
- **Operationalizing "Green Logistics" and Circularity Mandates:** To counter the massive carbon footprint of rapid deliveries, the government should introduce **"Circular Economy Credits"** for platforms that adopt plastic-free packaging and electric vehicle (EV) fleets.
  - Beyond simple subsidies, this involves mandating a **"Right to Repair" disclosure** and "Green Delivery" options at checkout, incentivizing consumers to choose consolidated, eco-friendly shipping over instant gratification.
  - This aligns e-commerce growth with **India's Net-Zero 2070 commitments** while reducing the long-term waste-management burden on urban infrastructure.
- **Establishing "Rural Digital Trade Hubs" (RDTH):** To bridge the urban-rural divide, the government should designate district-level "Daksh" centers as physical-cum-digital hubs that provide **shared warehousing, cold storage, and export-processing** facilities.
  - These hubs would act as the "first-mile" collection points integrated with the **PM Gati Shakti** masterplan, allowing rural producers to bypass middlemen and access national markets with lower logistics costs.
  - This physical infrastructure layer is the necessary counterpart to digital connectivity, ensuring that **"Digital India" results in tangible economic gain for the agrarian heartland.**
- **Enhancing "Data Sovereignty" and Trust Capital:** Strengthening consumer trust requires the strict enforcement of the **Digital Personal Data Protection (DPDP) Act** through **"Privacy-by-Design"** certifications for e-commerce apps.
  - Measures must include banning **"Dark Patterns"** (deceptive UI) and mandating **"Data Minimization" protocols,** where platforms only collect the bare minimum information needed for a transaction.
    - By **manufacturing "Trust Capital,"** the ecosystem can bring the next 500 million conservative users online, transforming e-commerce from an urban convenience into a secure national habit.
- **Institutionalizing "Skill-Credentialing" for Gig Workers:** The long-term stability of e-commerce depends on a formalized workforce; hence, the government should implement a **"Universal Social Security Account"** for delivery partners and warehouse staff.
  - This involves **creating a portable benefits system where every hour worked across different platforms contributes to a unified health and pension fund.** By stabilizing the labor supply and providing dignity to the gig economy, the sector **can reduce the high churn rates and labor strikes that currently threaten the reliability of the last-mile delivery chain.**

- **Implementing a "Gig Worker Social Security Command":** As the sector relies heavily on the "quick commerce" labor force, the state must transition from optional welfare to a **mandatory, portable social security command**.
  - This involves a **centralized digital ledger that tracks a delivery partner's "service hours" across multiple platforms** (Swiggy, Blinkit, Zepto) to provide a unified health insurance and pension scheme.
  - By decoupling benefits from a single employer, the government can stabilize the volatile **gig labor market**, reducing the operational risks of strikes and high churn while ensuring the **long-term human sustainability of the "10-minute delivery" economy.**
- **Mainstreaming Green Packaging in E-Commerce:** Enforce minimum thresholds for **recyclable, biodegradable, and compostable materials under EPR norms for e-commerce platforms.**
  - Provide GST incentives and viability gap support for startups and MSMEs producing eco-friendly packaging.
  - Require e-commerce firms to disclose packaging footprints and adopt **"right-sized" packaging to reduce material intensity.**
  - Promote reusable packaging and deposit-refund models, leveraging Digital Public Infrastructure for traceability and compliance.

Conclusion:

India's e-commerce ecosystem stands at the crossroads of **digital innovation, inclusive growth and market fairness**, making it central to the vision of **Viksit Bharat**. By leveraging **digital public infrastructure, AI-driven productivity and MSME integration**, the sector can unlock jobs, exports and entrepreneurship at scale. However, sustaining this momentum requires **competition neutrality, trust-based data governance and humane gig-economy safeguards**. With calibrated regulation and innovation-friendly policy, e-commerce can evolve from a convenience economy into a **nation-building growth engine for Viksit Bharat**.

Rethinking India'S Fiscal Sustainability

This editorial is based on "Debt, deficits, growth: Why state discipline matters for fiscal health" which was published in The Business Standard on 29/01/2026. The article argues that India's medium-term fiscal sustainability hinges not only on central government consolidation but critically on state-level fiscal discipline and growth-driven debt management.

India's fiscal health is increasingly being judged through the lens of **public debt sustainability rather than annual fiscal deficits**, especially after the pandemic. **General Government Debt to GDP ratio increased from 75.7% at the end-March 2020 to 89.6% at the end of the pandemic year FY21**, before moderating gradually with recovery. With State governments accounting for nearly one-third of total public debt, the shift recommended by the **N K Singh Committee** from deficit targets to a debt anchor highlights that **state-level fiscal discipline and growth are now central to India's medium-term fiscal sustainability**.

What is the Current Fiscal Regulatory Framework in India?

- **Constitutional Pillar:** The Finance Commission
  - Established under **Article 280** of the Constitution, the Finance Commission (FC) acts as the "balancing wheel" of fiscal federalism.
    - **Resource Allocation:** It recommends the **Vertical Devolution** (share of central taxes going to states) and **Horizontal Devolution** (allocation among states based on criteria like population, income distance, and forest cover).
    - **Grants-in-Aid:** It determines the principles for providing grants to states that face revenue deficits or need funds for local bodies and disaster management.
- **Legislative Pillar:** The FRBM Act (2003)
  - The **Fiscal Responsibility and Budget Management (FRBM) Act** is the primary legal tool for ensuring fiscal discipline.

- **Core Targets:** It mandates the government to limit the **Fiscal Deficit** and reduce the **Debt-to-GDP ratio** (the **NK Singh Committee** recommended a target of 60% for General Government debt, **40% for Centre and 20% for States).**
- **Transparency:** The Act requires the government to lay three policy statements before Parliament along with budget annually:
  - Medium-term Fiscal Policy Statement.
  - Fiscal Policy Strategy Statement.
  - Macroeconomic Framework Statement.
- **The Escape Clause:** Under **Section 4(2), the government can deviate from targets by up to 0.5% of GDP** during "extraordinary circumstances".

- **Revenue Pillar:** The GST Council
  - The **101st Constitutional Amendment** created the **GST Council**, a joint forum of the Centre and States.
    - It harmonizes indirect taxation, which is crucial for revenue buoyancy.
    - By bringing most indirect taxes under one umbrella, it aims to reduce tax leakage and improve the **Tax-to-GDP ratio**, a vital indicator of fiscal health.
- **Institutional Monitoring:** NITI Aayog & CAG
  - **NITI Aayog:** Recently, NITI Aayog introduced the **Fiscal Health Index (FHI)**. The FHI analysis examines 18 major states that are pivotal to India's economy, based on their **contributions to GDP, population, public expenditure, revenues, and overall fiscal stability.**
  - **Comptroller and Auditor General (CAG):** CAG audits the accounts of the Union and States, ensuring that public spending adheres to the law and that there is no **"off-budget borrowing" that masks the true fiscal deficit.**

Fiscal Health Index

- **About:** The Fiscal Health Index (FHI), released by **NITI Aayog in January 2025,** is a composite index assessing the fiscal sustainability of **18 major Indian states** using audited **CAG data for FY20222-23.**
  - It moves **beyond headline fiscal deficit numbers** to evaluate expenditure quality, revenue capacity and debt sustainability.
- **Key Indicators:**
  - **Revenue Mobilisation**: States' own revenue performance, tax buoyancy, and non-tax revenues.
  - **Expenditure Management**: Efficiency of spending, prioritisation of capital expenditure, and fiscal discipline.
  - **Debt Management:** Debt-to-GSDP levels, interest burden, and debt sustainability.
  - **Fiscal Deficit Control**: Fiscal deficit as a share of GSDP and compliance with statutory limits.
  - **Overall Fiscal Sustainability**: Integrated assessment of revenue, expenditure, deficit, and debt indicators.
- **Key Findings:**
  - **Odisha** leads the fiscal health index with a top score of 67.8 followed by **Chhattisgarh, Goa, Jharkhand and Gujarat.**
    - Conversely, **Punjab, Andhra Pradesh, West Bengal, and Kerala** face significant fiscal challenges, including low expenditure quality, poor debt sustainability, and high fiscal deficits

How has India's Approach to Fiscal Consolidation Evolved Recently?

- **Strategic Shift-From Deficit Targeting to Debt Anchoring:** The government has announced to **formally transition its primary fiscal anchor** from the annual fiscal deficit to a medium-term Debt-to-GDP ratio, aiming to ensure intergenerational equity and secure sovereign rating upgrades.
  - This structural reform prioritizes **long-term solvency over short-term accounting adjustments**, signaling a mature fiscal framework that aligns with global best practices.

- For instance, reflecting a calibrated consolidation strategy, the Centre has outlined a medium-term objective of lowering **central government debt to about 50±1 % of GDP by FY2030-31**, with **outstanding liabilities budgeted at 56.1% of GDP in FY2025-26 (BE)** declined from 57.1 in FY 2024-25.
- **Adherence to the 'Glide Path' Amid Global Headwinds:** Despite global geopolitical volatility and election-year pressures, the Centre has strictly adhered to its fiscal glide path, demonstrating **counter-cyclical fiscal discipline** to build market credibility.
  - This **resistance to populist expansionism** ensures that private investment is not "crowded out" by excessive government borrowing, keeping bond yields stable.
  - For instance, signalling a clear consolidation intent, the **fiscal deficit has been budgeted at 4.4% of GDP in FY2025–26**, marking a decisive improvement from the **Revised Estimate of 4.8% in FY2024–25**, and aligning closely with the medium-term objective of bringing the deficit **below 4.5% of GDP**.
- **'Capex-Led' Consolidation- Focusing Quality of Expenditure:** There is a deliberate multidimensional strategy to improve the **"Quality of Deficit"** by slashing consumption spending (revenue deficit) while aggressively hiking **Capital Expenditure (Capex)**.
  - This ensures that **borrowing is used for asset creation** (roads, defense, railways) which has a **high fiscal multiplier effect**, rather than servicing salaries or subsidies.
  - For example, the **revenue deficit has been reduced to 1.5% of GDP in FY2025–26 from 1.9% in FY2024–25**, while **effective capital expenditure has been stepped up to about 4% of GDP in FY25 (Economic Survey 2025-26)** , signalling a clear shift from consumption-led spending to growth-augmenting investment.
- **Digitization-Driven Revenue Buoyancy:** Fiscal consolidation is now being driven by **revenue augmentation** via technology (**AI & Data Analytics**) rather than just tax rate hikes, leading to the formalization of the economy.
  - The strategy focuses on widening the tax net and plugging GST leakages, resulting in a tax buoyancy greater than 1, which acts as a natural fiscal stabilizer.
  - For instance, reflecting improved tax buoyancy and compliance, **Income Tax Return filings rose sharply to about 9.2 crore in FY2024–25 from 6.9 crore in FY2021–22**, while the **share of direct taxes in total tax revenue climbed to nearly 58.8% (Economic Survey 2025-26)**, significantly strengthening revenue capacity and easing fiscal deficit pressures.
- **'Carrot and Stick' Federal Fiscal Discipline:** The Centre has operationalized a **cooperative yet conditional** fiscal framework, linking **state borrowing limits to specific power and urban sector reforms.**
  - This prevents state-level fiscal profligacy from derailing national consolidation, treating General Government Debt (Centre + States) as the true metric of health.
  - For example, while incentivising sub-national consolidation, the Centre has earmarked **₹1.5 lakh crore as 50-year interest-free loans to states in FY2025–26**, with disbursements linked to reforms and compliance conditions, even as **aggregate state government debt remains elevated at around 27.5% of GDP**. (as of 2024-25)
- **Rationalization of Subsidy Bill:** A critical analytical development is the structural reduction of the **non-merit subsidy burden**, shifting from **universal subsidies to targeted direct benefit transfers (DBT).**
  - By weaning the **budget off heavy fuel and fertilizer subsidies through efficiency measures (like Nano-urea)**, the government has created fiscal space for developmental goals without blowing the deficit.
  - For instance, the **total subsidy bill has been compressed to about 1.1% of GDP in FY2025–26** . Further, the Economic Survey 2025-26 advised the government to increase the retail price of urea, which has remained unchanged at Rs 242 per 45 kg bag since 2018.

- **Zero-Based Budgeting in Scheme Allocation:** The government has adopted a **Zero-Based Budgeting** approach for central sector schemes, merging redundant programs to prevent fund parking and improve outcome-based spending.
  - This ensures that **every rupee borrowed contributes to measurable economic output, reducing the "Primary Deficit"** which reflects the current fiscal impulse excluding interest payments.
  - For example, **Current Account Deficit moderated to 0.8% of GDP in H1 FY26 from 1.3% in H1 FY25 (Economic Survey 2025-26).**
- **Cracking Down on Sub-National Off-Budget Liabilities:** The Centre has structurally tightened **sub-national fiscal discipline** by incorporating Off-Budget Borrowings (OBB) into **states' net borrowing ceilings**, effectively ending the era of hidden leverage and opaque guarantees.
  - This move forces states to boost **Own Tax Revenue (OTR)** and fix contingent liabilities, particularly by linking additional borrowing space directly to measurable **power sector reforms** to ensure DISCOM viability.

What are the Key Issues Associated with the Fiscal Consolidation in India?

- **Rigid 'Committed Expenditure' Trap:** The primary structural bottleneck is the high rigidity of **"committed expenditure" (Interest, Pensions, Salaries)**, which severely limits the discretionary fiscal space available for developmental goals.
  - This creates a **"scissors effect" where debt servicing eats into capital creation,** forcing the government to borrow just to pay off old interest rather than generating new economic value.
  - For example, highlighting the structural drag of legacy debt, **interest payments absorb nearly 37% of revenue receipts and about 25% of total expenditure in FY2024–25 (RE)**, implying that **over one-third of tax revenues are pre-empted by past liabilities before resources can be deployed for future-oriented development**.
- **Asymmetric Federalism & The 'Cess' Conundrum:** A major friction point is the Centre's reliance on **"Cesses and Surcharges"** to shore up revenue, **as these are not shared with States,** effectively shrinking the true devolution pool below the constitutional spirit.
  - This **forces States into a fiscal straitjacket, compelling them to cut their own developmental spending** or resort to expensive market borrowings to fund local infrastructure.
  - While the Finance Commission mandates **41% devolution**, the *effective* share to states often hovers ~**33%** due to cesses & surcharges
    - The central government has budgeted to collect about ₹5.91 lakh crore from cess and surcharge in the current fiscal, a 9.43% growth over the collections in FY25, that raises concerns over **fiscal federalism**.
- **The 'Capex-Consumption' Trade-off :** The aggressive pivot to "Capex-led consolidation" often comes at the cost of compressing revenue expenditure on social welfare, **which risks exacerbating the "K-shaped" recovery** by dampening rural consumption.
  - If the government withdraws fiscal support from the bottom of the pyramid to fund highways, **it may trigger a demand-deficient slowdown that ultimately renders the capex multiplier ineffective.**
  - At the same time, Gross Fixed Capital Formation expanded by 7.8% but remained capped at 30% of GDP.
    - With **private capex's share in GFCF falling to 34.4% in 2023-24, the lowest since 2011-12**, continued reliance on public capex risks a fiscal-constrained "growth cliff" if private investment fails to revive.
- **Sub-National Fiscal Opaqueness (OBB):** While the Centre's deficit numbers look cleaner, "General Government" health is undermined by States hiding deficits through **"Off-Budget Borrowings" (OBB) via state-owned entities.**
  - This opaque leverage **acts as a hidden sovereign risk**, meaning the true public sector borrowing

requirement (PSBR) **is higher than the headline fiscal deficit numbers suggest.**
   - For instance, as per the **RBI study on State Finances**, aggregate state debt is estimated to **rise to 29.2% of GDP by end-March 2026, far above the FRBM limit of 20%.**
- **Human Capital Opportunity Cost:** The obsession with **"hard" infrastructure** (physical assets) to boost the GDP multiplier often leads to the **neglect of "soft" infrastructure** (Health & Education), **which has longer gestation periods but higher long-term productivity**.
   - **Consolidating the deficit by capping social sector spending risks eroding India's demographic dividend,** trading long-term human capability for short-term accounting solvency.
   - For instance, **combined public expenditure on health remains below 2% of GDP,** falling short of the National Health Policy target of 2.5%.
- **Disinvestment & Asset Monetization Uncertainty:** The government's fiscal math frequently relies on ambitious disinvestment and asset monetization targets **(National Monetization Pipeline)** which historically underperform due to market volatility or bureaucratic delays.
   - When these **"non-debt capital receipts" fall short**, the government is forced to cut spending or borrow more, compromising the integrity of the fiscal glide path.
   - For instance, the **government raised ₹33,000 crore from share sales in FY25**, **missing its disinvestment target of ₹50,000 crore.**
- **Vulnerability to Global External Shocks:** India's fiscal consolidation remains exposed to **energy price volatility and global trade disruptions**, as geopolitical fragmentation and tariff wars can erode trade-linked revenues while inflating subsidy outlays.
   - A sharp rise in crude or fertilizer prices can quickly derail deficit targets, with **every $10 per barrel increase in oil worsening the current account by nearly $15 billion**, forcing **counter-cyclical fiscal intervention**.

What Measures are Needed to Strengthen India's Fiscal Health ?

- **Institutionalizing 'Sunset Clauses' in Subsidies:** To curb the rigidity of committed expenditure, the government must legally mandate **'Sunset Clauses'** for all welfare schemes, requiring them to automatically expire or face rigorous re-evaluation after a fixed tenure.
   - This **prevents temporary relief measures from morphing** into permanent fiscal burdens and forces a periodic **'Zero-Based Budgeting' review.**
      - It ensures resources are dynamically reallocated to high-priority sectors rather than getting locked into legacy entitlements that have outlived their utility.
- **'Recycling Capital' via Asset Monetization:** Instead of outright privatization, the focus should shift to the **National Monetization Pipeline** by leasing brownfield assets (roads, power grids) to long-term investors to unlock upfront liquidity.
   - This strategy of **'recycling capital' allows the government to fund new greenfield infrastructure** using the equity trapped in completed projects without raising fresh debt.
      - It effectively **transforms the government's role from an asset operator to an asset developer,** maximizing the velocity of public capital.
- **Performance-Linked Fiscal Devolution:** The fiscal federalism framework needs to be recalibrated to incentivize **fiscal performance efficiency** where a portion of central transfers is strictly tied to states adhering to debt ceilings and eliminating off-budget borrowings.
   - This **encourages competitive federalism, compelling state governments to prioritize capital formation over populist revenue expenditure**.
   - By aligning state-level political incentives with national macroeconomic stability, the Centre can mitigate sub-national fiscal risks.
- **Algorithmic Intelligence in Revenue Mobilization:** The administration must pivot from **discretionary enforcement to AI-driven non-intrusive compliance**,

leveraging big data to cross-seed **GST, income tax, and property databases for a '360-degree taxpayer view.'**
    - This automates the identification of tax evasion in the informal sector and high-net-worth non-filers without increasing tax terrorism or harassment.
    - By fixing the 'missing middle' in the tax base, the state can improve **tax buoyancy** and revenue elasticity without needing to hike existing tax rates.
- **Outcome-Based Budgeting with Independent Oversight:** India must transition from **'input-based' allocation to strict 'Outcome-Based Budgeting',** where fund release is contingent upon verifiable, **third-party audited milestones** rather than just utilization certificates.
    - Establishing an independent **Fiscal Council** to monitor the quality of spending ensures accountability and **prevents the wasteful 'March Rush' of year-end spending.**
    - This institutional guardrail ensures that every rupee borrowed delivers a tangible multiplier effect on the economy.
- **Deepening the Sovereign Bond Market:** To reduce vulnerability to interest rate volatility, the debt management strategy must focus on **elongating the maturity profile** of government securities and diversifying the investor base via global bond index inclusion.
    - **By attracting patient, long-term global pension funds into Indian debt**, the government can reduce the **'crowding out'** of the domestic banking sector.
    - This lowers the cost of borrowing for the private sector and stabilizes the yield curve against domestic liquidity shocks.
- **Integration of 'Green Fiscality':** Fiscal policy must be future-proofed by introducing **'Green Fiscal Reforms'**, such as differential taxation that penalizes carbon-intensive inputs while offering tax holidays for green technology adoption.
    - Issuing **Sovereign Green Bonds ring-fenced for climate-resilient projects allows the government to tap into lower-cost global ESG capital pools**.
    - This not only funds the transition but also insulates the economy from future cross-border carbon tariffs **(CBAM) that threaten trade revenues.**
- **Formalization via Digital Public Infrastructure:** The government should leverage Digital Public Infrastructure (DPI) to incentivize MSME formalization through **simplified presumptive taxation** and cash-flow-based lending protocols (like OCEN), rather than regulatory coercion.
    - Bringing the **informal economy into the formal credit and tax net broadens the direct tax base naturally as small enterprises grow**.
    - This reduces the dangerous over-reliance on a handful of large corporate taxpayers and builds a resilient, diversified revenue structure.

Conclusion

India's fiscal consolidation marks a shift from **deficit arithmetic to debt sustainability**, anchored in capex-led growth and revenue buoyancy. However, **state-level discipline, quality of expenditure, and federal coordination** will determine the durability of this path. Managing **committed expenditure, off-budget risks, and global shocks** remains crucial to prevent fiscal slippage. A credible mix of **growth-led consolidation, cooperative federalism, and institutional fiscal safeguards** is key to long-term macroeconomic stability.

Drishti Mains Questions

1. "Sustainable fiscal consolidation is central to India's long-term growth strategy." Discuss the key challenges in India's fiscal management and evaluate the measures required to ensure fiscal sustainability while supporting economic growth.
2. The growth of the gig economy has outpaced the development of labour protections in India.Examine the challenges faced by gig workers and suggest policy measures to ensure fair and sustainable employment.
3. Discuss how climate-related trade measures such as the EU's Carbon Border Adjustment Mechanism (CBAM) are reshaping India–EU economic relations. What policy responses should India adopt to safeguard its developmental interests?
4. Transforming waste from a burden into a resource is central to India's urban sustainability goals. Analyze the role of policy reforms, financing mechanisms, and citizen participation in achieving the objectives of Swachh Bharat Mission and Mission LiFE.
5. *Unpaid care and domestic work forms the invisible foundation of India's economy.* Examine the structural reasons behind its invisibility and suggest measures to strengthen the care economy in India.
6. Rapid growth in India's civil aviation sector has outpaced regulatory and institutional capacity. Examine the key challenges this poses for aviation safety, governance, and sustainability, and suggest suitable reforms.
7. Discuss the role of MSMEs in achieving employment-led and inclusive growth in India. How can reforms in credit delivery, technology upgradation, and market access enhance their contribution to GDP and exports?
8. "The increasing use of 'law enforcement' narratives to justify cross-border military actions reflects a deeper erosion of the UN Charter's prohibition on the use of force." Critically examine this trend in the context of recent U.S. actions against Venezuela, and discuss its implications for multilateralism and India's strategic interests.
9. "India's energy security has evolved from ensuring access to building resilience and sustainability." Examine this statement in the context of India's changing energy mix and clean energy transition.
10. Despite strong historical and economic ties, India–Bangladesh relations face several structural challenges. Examine the key impediments and suggest measures to strengthen bilateral cooperation in the changing regional context.
11. India's growth in recent years has been driven by productivity gains rather than labour absorption.Discuss the structural reasons behind jobless growth and evaluate policy options to align high growth with decent employment.
12. How can India and Germany leverage their complementary strengths to promote resilient supply chains, green transition and reformed global governance? Discuss in the context of emerging geopolitical and economic uncertainties.
13. How does India's high import dependence on critical minerals affect its energy security and manufacturing competitiveness? Suggest a multi-pronged strategy to address these vulnerabilities.
14. Updating price indices is as much an economic governance issue as a statistical exercise. Discuss this statement in the context of India's CPI reforms, including base-year revision, regional granularity, and use of alternative inflation indicators.
15. Evaluate the role of the private sector in strengthening India's space ecosystem in light of IN-SPACe's Decadal Vision and Strategy. How can commercial growth be aligned with India's defence and strategic space requirements?
16. Despite multiple policy initiatives, manufacturing in India has remained stuck at around 16–17% of GDP. Examine the structural constraints limiting its role in employment generation and structural transformation.
17. The Andaman and Nicobar Islands highlight the tension between national security priorities and human security concerns. Analyse this paradox and suggest an ethical and people-centric development approach.

18. "India–UAE relations have evolved from civilizational connectivity to a comprehensive strategic partnership."Critically examine this transformation with reference to geopolitical realignments, economic integration, and security cooperation in the post-2015 period.
19. "Natural farming is not an ideological alternative but an economic and ecological correction to India's input-intensive agricultural model." Examine the statement in light of recent policy initiatives and transition challenges.
20. Despite constitutional recognition under the 74th Amendment, urban local bodies in India continue to suffer from weak autonomy and fragmented accountability. Critically examine the structural and institutional challenges in India's urban governance framework and suggest reforms needed to transform cities into effective engines of inclusive and sustainable growth.
21. While the National Education Policy (NEP) 2020 has expanded access to higher education, it has not fully addressed institutional quality and research capacity. Discuss the need for second-generation reforms in India's higher education system to achieve the goal of Viksit Bharat by 2047
22. "The Himalayan crisis is as much a failure of governance and planning as it is of climate change." Critically examine this statement in the context of infrastructure development, land-use practices and disaster resilience in the Indian Himalayan Region.
23. Cybersecurity in India is no longer a technical issue but a strategic governance challenge. Examine in the context of emerging cyber threats and global cyber governance fragmentation.
24. Discuss how the India–EU Free Trade Agreement reflects India's evolving trade strategy in an era of supply-chain de-risking and green regulation. Examine its potential benefits and key implementation challenges.
25. "E-commerce has emerged as a critical pillar of India's digital economy and the vision of Viksit Bharat."Discuss the key drivers of e-commerce growth in India and examine the structural challenges that may hinder its long-term sustainability.
26. India has shifted from fiscal deficit targeting to a debt-anchored fiscal framework. Examine the rationale behind this transition and analyse the role of state-level fiscal discipline in ensuring medium-term debt sustainability.