



7 PM COMPILATION

April, 2026

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- ❖ Comprehensive coverage of a given current topic
- ❖ Provide you all the information you need to frame a good answer
- ❖ Critical analysis, comparative analysis, legal/constitutional provisions, current issues and challenges and best practices around the world
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Pradhan Mantri Awaas Yojana-Gramin (PMAY-G): Impact and Challenges- Explained Pointwise

India's rural housing mission has completed a decade of transformation, with Pradhan Mantri Awaas Yojana - Gramin (PMAY-G) growing into one of the most ambitious social welfare programmes in the country's history. With a **cumulative target of 4.95 crore houses by 2029**, rural housing has become a cornerstone of India's **Viksit Bharat vision**.

This article examines PMAY-G's background, key achievements, implementation framework, impact on rural households, AI-driven monitoring innovations, and the way forward.



Source- PIB

What is PMAY-G? What is its background and basic features?

PMAY-G is a **centrally sponsored scheme** launched on **1st April 2016** by the Ministry of Rural Development. It replaced the erstwhile **Indira Awaas Yojana (IAY)**, which had well-documented weaknesses in beneficiary targeting, fund management, and construction quality.

Objective- The scheme aims to provide a pucca (permanent) house with basic amenities to all houseless households and those living in kutchha or dilapidated structures in rural India, advancing the mission of **"Housing for All."**

Basic Features of PMAY-G

1. Minimum house size-Each house must be at least **25 sq. m.**, including a dedicated area for hygienic cooking. This is an improvement over the earlier 20 sq. m. norm under Indira Awaas Yojana (IAY).

2. Target Beneficiaries- It selects beneficiaries using housing deprivation parameters in the **Socio-Economic and Caste Census (SECC), 2011**, which is to be verified by the Gram Sabhas. The scheme prioritises landless beneficiaries and mandates that a minimum of **60% of targets are earmarked for SC/ST households** at the National level.

3. Funding Pattern- Cost is shared between the Central and State governments in a **60:40 ratio for plain areas** (90:10 for North Eastern and Himalayan states; 100% for UTs).

4. Financial assistance- Beneficiaries receive **Rs. 1.20 lakh in plain areas** and **Rs. 1.30 lakh in hilly, difficult, and Integrated Action Plan (IAP) districts**. Funds are released in instalments directly through DBT.

5. Beneficiary-led construction- Households themselves build their homes, ensuring a sense of ownership and ground-level quality control that top-down construction models often lack.

6. Phased implementation- **Phase I and II target 4.15 crore houses**, with a cumulative Phase III target of 4.95 crore houses by 2029.

7. Convergence-driven approach- Every PMAY-G house is intended to come bundled with a **toilet** (Swachh Bharat Mission- Grameen), an **LPG connection** (PM Ujjwala), **piped water** (Jal Jeevan Mission), **electricity** (Saubhagya/PM Surya Ghar), and **wage employment** (VB: G RAM G/MGNREGA), making the scheme a genuine platform for holistic rural development.

What are the key achievements of PMAY-G so far?

As of 26 March 2026, the following milestones have been recorded under Phase I and II:

Targets and completions	Out of a total allocation of 4.15 crore houses , 3.90 crore have been sanctioned and 2.99 crore have been completed , reflecting a strong pace of ground-level delivery sustained over a decade.
Fund transfers	A cumulative Rs. 4,03,886.12 crore has been transferred directly to beneficiaries' bank accounts through DBT, making it one of the largest direct benefit transfer exercises in any social welfare programme globally.
Convergence benefits delivered	Beneficiaries have simultaneously received toilets (Rs. 12,000 from SBM-G), 90–95 person-days of MGNREGA wages, LPG connections under PM Ujjwala, and electricity and piped water connections. It turns each house into a multi-amenity package rather than just a roof over the head.
Skill development	The Rural Mason Training programme , supported by the National Skill Development Corporation (NSDC), has enrolled 3,75,265 candidates and certified 3,02,377 masons as of November 2025, meaningfully building local construction capacity.
Women's ownership	House ownership is encouraged in women's names or jointly with spouses, an initiative that goes beyond housing to contribute to SDG 5a on gender equality and women's land rights .

What is the implementation framework and governance reforms under PMAY-G?

PMAY-G has introduced several systemic reforms that go well beyond conventional scheme delivery:

1. Direct Benefit Transfer (DBT)- Financial assistance is released in tranches directly into the beneficiary's bank account. This eliminates middlemen, reduces leakage, and has helped deepen financial inclusion in rural India.

2. Geo-tagging of houses – Time and date-stamped photographs are uploaded at every stage of construction, from the foundation to the lintel to the roof. This creates a verifiable digital record for real-time monitoring. For ex- any deviation from construction norms can be flagged immediately through the uploaded geo-tagged image.

3. Village-level functionaries- Every sanctioned house is tagged to a specific local functionary who provides hands-on support and follows up with the beneficiary to ensure timely completion.

4. Block and district inspections- Block-level officers physically inspect around 10% of houses at each construction stage, while district officers cover around 2%, adding a layered institutional quality check to the digital monitoring.

5. Social audits- Every Gram Panchayat conducts a formal social audit at least once a year. This community-led review covers beneficiary selection, fund utilisation, and construction quality, reinforcing accountability from the ground up.

6. National-level monitoring- Officers and national-level monitors from the Ministry of Rural Development conduct periodic field inspections to verify beneficiary selection and confirm that procedures are followed correctly.

7. AwaasSoft MIS platform- This bilingual, web-based platform integrates all scheme functions, from beneficiary identification and sanction orders to fund release and construction tracking, into a single source of information for all stakeholders.

What has been the impact of PMAY-G on rural households?

1. Improved living conditions- Families have moved from weather-vulnerable kutchha homes to durable, weather-resistant pucca structures, bringing stability and dignity to millions of households. For ex Taid, a widow from flood-prone Jorhat district in Assam, built a permanent home under PMAY-G in 2016-17 that now protects her family from annual floods.

2. Access to sanitation- Convergence with SBM-G has provided PMAY-G beneficiaries Rs. 12,000 for toilet construction, directly improving hygiene and contributing to ODF (Open Defecation Free) status across villages.

3. Employment generation- The scheme ensures 90-95 person-days of unskilled labour wages under MGNREGA (now VB: G RAM G) per house, providing livelihood support to rural workers during the construction period itself.

4. Clean cooking energy- Linkage with PM Ujjwala Yojana has enabled households to shift away from traditional biomass fuels to LPG, reducing indoor air pollution and meaningfully improving women's health outcomes.

5. Electricity and water access- Beneficiaries gain access to electricity through Saubhagya and PM Surya Ghar, and piped drinking water through Jal Jeevan Mission, reducing daily drudgery especially for women and girls.

6. Renewable energy integration- Solar lanterns and rooftop solar systems have been introduced in PMAY-G homes, promoting sustainable energy use in off-grid rural communities.

7. Women's empowerment- As per the **National Institute of Public Finance & Policy (NIPFP) Study Report (2019)**, encouraging house ownership in women's names contributes to property rights, improved social standing, and India's SDG 5a commitments on gender equality.

8. Skill creation- The **Rural Mason Training programme** has directly addressed the shortage of trained construction workers in villages, creating a steady pipeline of certified masons while generating dignified rural livelihoods.

How is AI-driven technology being used in monitoring PMAY-G?

PMAY-G has become a pioneer in deploying **Artificial Intelligence (AI) and Machine Learning (ML)** for social sector monitoring:

1. AI-based photo recommendation system- AI models scan uploaded house photographs to detect attributes such as walls, roofs, doors, and windows. Based on this analysis, the system recommends the most suitable final photograph for approval, ensuring that only genuinely complete houses are certified as finished.

2. Anomaly detection and fraud prevention- ML algorithms compare a house photograph with others in the same locality. If suspicious similarities are detected, the system raises an alert to prevent duplication or fraudulent reporting. **For ex** identical photographs submitted for two different beneficiaries in the same village would trigger an automatic flag.

3. Aadhaar face authentication and e-KYC- Beneficiaries are verified through AI-enabled, Aadhaar-based face authentication before receiving funds, ensuring that only eligible households benefit and that the database remains credible.

4. Awaas+ 2024 mobile app- Developed in collaboration with the **Central Building Research Institute**, this app combines Aadhaar face authentication with **3D house designs**, helping beneficiaries visualise and plan their homes while maintaining full accountability in benefit delivery.

5. Liveness detection- Eye-blink and motion detection features during biometric verification confirm that the authentication is live and genuine, guarding effectively against impersonation and proxy verification.

What are the challenges in rural housing delivery under PMAY-G?

1. Gap between sanctioned and completed houses- As of March 2026, nearly **91 lakh sanctioned houses** remain incomplete. Delays stem from beneficiary migration, land disputes, inadequate local support, and financial constraints that the scheme's assistance alone cannot fully address.

2. Shortage of skilled labour- Quality rural construction demands trained masons. Despite the Rural Mason Training programme's progress, certified mason supply continues to fall short of demand in several states, affecting both construction speed and quality.

3. Power supply constraints- Stable electricity is essential not only for post-occupancy use but also for construction activities. In many remote areas, unreliable power supply disrupts timelines and limits the usability of completed homes.

4. Land and legal hurdles- Homestead land is a state subject, and a large number of eligible beneficiaries, especially SCs, STs, and women-headed households, lack clear land titles. This creates avoidable delays even when beneficiaries are willing and ready to build.

5. Last-mile digital exclusion- The scheme's dependence on geo-tagging, Aadhaar authentication, and the AwaasSoft platform poses real challenges in areas with poor internet connectivity or low digital literacy, risking exclusion of the most marginalised households.

6. Intra-state variations- Implementation quality varies significantly across states. Chronic underperformers often suffer from administrative capacity gaps, delayed fund utilisation, and weak panchayat-level oversight.

7. Quality of construction- Despite technological monitoring, ensuring structural durability in flood-prone, cyclone-prone, and seismic zones remains difficult without sustained on-ground technical guidance to individual beneficiaries.

What should be the Way Forward?

1. Accelerate completion of pending houses- A time-bound saturation campaign with district-wise targets must be launched for the 91 lakh incomplete houses. States with high incompleteness rates need focused technical and administrative hand-holding rather than just financial pressure.

2. Expand Rural Mason Training- The NSDC-supported certification programme must be scaled up substantially, with deliberate inclusion of women masons and tribal communities as part of a broader inclusive skilling agenda.

3. Resolve land rights as a pre-condition- States must be incentivised to complete homestead land allotments to landless beneficiaries, particularly SCs, STs, and single women, before house sanction rather than as an afterthought.

4. Strengthen digital infrastructure in remote areas- Offline-capable versions of AwaasSoft and Awaas+ must be made available in aspirational districts to ensure that poor connectivity does not compromise the integrity of monitoring.

5. Deepen convergence monitoring- Mandated convergence with Swachh Bharat Mission- Grameen [SBM(G)], Jal Jeevan Mission, and Ujjwala must be verified on the ground through a unified dashboard that tracks whether these amenities are actually functional in completed homes, not merely approved on paper.

6. Focus on disaster-resilient design- In flood-prone states like Assam and Bihar, cyclone-prone states like Odisha and Andhra Pradesh, and seismic zones, PMAY-G house designs must mandatorily incorporate disaster-resilient features, supported by technical expertise from CBRI and state institutions.

7. Harness AI for predictive governance- Beyond fraud detection, AI tools should be used to identify likely non-completion early in the construction cycle, enabling proactive intervention before houses slip into long-term stagnation.

Conclusion

A permanent home is the first step out of poverty. PMAY-G has proven that large-scale welfare delivery is achievable in India. As 2029 approaches, the focus must shift from ambition to execution, ensuring no eligible rural household is left behind.

Read More: [PIB](#)

UPSC Syllabus: GS 2 – Government Policies and Interventions | GS 3 – Inclusive Growth and Issues Arising from It

Tribunals in India- Explained Pointwise

The Supreme Court recently directed 19 appellate tribunals – headed by former Chief Justices and High Court judges to adjudicate pleas related to voter inclusion and exclusion during West Bengal's Special Intensive Revision (SIR) of electoral rolls, with over 60 lakh objections filed.

This highlights the critical role tribunals play in upholding democratic processes and brings renewed focus on the debate over tribunal efficiency and independence in India. This article examines the constitutional framework, historical evolution, significance, challenges for tribunals in India.



What are the tribunals?

- Tribunal is a specialized, **quasi-judicial body** established to resolve specific disputes, such as administrative or tax-related issues. It **adjudicates disputes, determines rights, and reviews administrative decisions**.
- They serve as alternatives to traditional courts and specialize in providing faster, cost-effective, and expert resolutions for particular kinds of cases.
- **Objective:** Tribunals reduce the burden on regular courts and provide specialized dispute resolution that is swift, efficient, and accessible.
- As of early 2026, the number of pending cases in India has exceeded 5.5 crore (55 million), with over 4.5 crore pending in district courts alone. According to the **Tribunals Reforms Act, 2021**, the Government has merged and rationalized several tribunals, aiming to improve efficiency.

Key Characteristics:

- **Specialization:** They deal exclusively with matters requiring specific, domain-based expertise (e.g., tax, telecom, or electricity).
- **Faster Disposal:** They aim to offer a quicker and more efficient resolution mechanism than the regular civil courts.
- **Less Formal:** Procedures are generally simpler and less rigid than those followed by civil courts, though principles of natural justice must always be adhered to.

- **Composition:** They typically include both judicial members (retired judges or lawyers) and **administrative/technical members** who possess specialized knowledge in the relevant field.

What are the constitutional and legal provisions related to Tribunals in India?

The original Constitution did not include provisions related to tribunals. However, the **42nd Amendment Act of 1976** introduced **Part XIV-A**, titled “**Tribunals**,” which consists of two articles:

- **Article 323A** – Pertains to administrative tribunals.
- **Article 323B** – Covers tribunals for other specific matters

Provisions	Description
Article 323A	Grants Parliament the power to establish administrative tribunals for resolving disputes related to recruitment and service conditions of individuals employed in the Central and state governments, local bodies, public corporations, and other public authorities
Article 323B	Authorizes both Parliament and state legislatures to create tribunals for various matters, including industrial and labor disputes, foreign exchange, land reforms, elections, rent and tenancy rights, and more.

Administrative Tribunals Act, 1985

To implement Article 323A, Parliament enacted the Administrative Tribunals Act, 1985, empowering the Central Government to establish:

- **Central Administrative Tribunal (CAT)** for central government employees.
- **State Administrative Tribunals (SATs)** for state government employees.

What are the landmark judgement's related to tribunals in India?

S.P. Sampath Kumar v. Union of India (1987)	Recognized tribunals as substitutes for High Courts and upheld their constitutional validity .
L. Chandra Kumar v. Union of India (1997)	Declared that tribunals cannot act as substitutes for High Courts and must be subject to judicial review under Article 226 and 227 .
Madras Bar Association v. Union of India 2014	Administrative support for all tribunals should come under the Ministry of Law and Justice.

Roger Mathew versus South Indian Bank Limited & ors, 2019	The impact of amalgamation of tribunals should be analysed with judicial impact assessment .
Madras Bar Association versus Union of India, 2020	National Tribunals Commission should be set up to supervise appointments, as well as functioning and administration of tribunals.
Madras Bar Association versus Union of India, 2021	Struck down various provisions in tribunal reforms that undermined judicial independence.

What are the key developments in the Indian tribunal system?

Pre-Independence Era (Before 1947)	The Income Tax Appellate Tribunal was established as India's first tribunal to reduce court workload and expedite tax dispute resolution
Post-Independence Era (1947–1980)	1950: Industrial Disputes (Appellate Tribunal) Act provided for an appellate tribunal to handle industrial disputes. 1969: The First Administrative Reforms Commission recommended Civil Services Tribunals at national and state levels for service-related disputes. 1974: The Sixth Law Commission suggested high-powered tribunals to reduce High Court case backlogs. 1976: The Swaran Singh Committee recommended setting up: a. Administrative Tribunals ((both at national level and state level) for service-related cases. b. All-India Appellate Tribunal for labor disputes. c. Sector-specific tribunals for revenue, land reforms, and essential commodities. d. Supreme Court oversight for tribunal decisions.
Golden Era of Tribunalization (1980–2000)	Establishment of several tribunals, including: a. Central Administrative Tribunal (CAT) – for administrative matters. b. Securities Appellate Tribunal (SAT) – for financial sector disputes. c. Film Certification Appellate Tribunal – for film certification disputes. d. Appellate Tribunal for Electricity – for tariff-related cases.

2000–2016: Expansion of Tribunals	2000: Debt Recovery Tribunal (DRT) – for resolving disputes between banks and borrowers. 2002: Competition Commission of India (CCI) and Competition Appellate Tribunal (COMPAT) – to regulate fair competition. 2010: National Green Tribunal (NGT) – for environmental disputes. 2016: National Company Law Tribunal (NCLT) & National Company Law Appellate Tribunal (NCLAT) – for corporate and insolvency matters.
2017- Merger of COMPAT with NCLAT	The Finance Act, 2017 reduced the number of tribunals from 26 to 19 based on functional similarity. It gave the central government authority to define qualifications, appointments, and service conditions for tribunal members.
Tribunal Reforms Act, 2021	The Tribunals Reforms (Rationalization and Conditions of Service) Bill, 2021 aimed to streamline the tribunal system . Nine tribunals were abolished , transferring their functions to existing judicial bodies, mainly High Courts.

Why are tribunals important, and what is their significance?

- 1. Speedy Justice:** Tribunals are designed to offer **faster dispute resolution** compared to traditional courts. E.g. The **Consumer Disputes Redressal Commissions** resolve cases within 3-6 months, NCLT expedited cases under the **Insolvency and Bankruptcy Code (IBC), 2016**, ensuring faster debt recovery.
- 2. Specialized Expertise:** Tribunals were designed to handle complex, sector-specific disputes requiring technical expertise. E.g. **Power sector (APTEL), taxation (ITAT), corporate law (NCLAT), copyright (IPAB)**.
- 3. Reducing Court Burden:** By handling **specialized cases**, tribunals reduce the workload of **high courts** and the **Supreme Court**. E.g. The **Central Administrative Tribunal (CAT)** has significantly reduced litigation burden in service-related disputes.
- 4. Economic Governance:** Tribunals like the **NCLT** and **DRT** play a critical role in ensuring economic stability and ease of doing business. E.g. Creditors have recovered approximately Rs 3.55 lakh crore by resolving 1,068 insolvency cases under the IBC, 2016, as of September 2024 since 2016.
- 5. Environmental Protection & Protecting Fundamental Rights:** The **National Green Tribunal (NGT)** has played a pivotal role in environmental protection cases like the **Vizag Gas Leak (2020)**. It is also instrumental in addressing environmental issues, such as the Yamuna pollution case and illegal mining in Aravalli Hills.
- 6. Access to Justice:** Tribunals provide a cost-effective and accessible forum for resolving disputes, especially for **marginalized groups**.
- 7. Alternative Dispute Resolution (ADR):** Tribunals provide an alternative dispute resolution mechanism, which can be less adversarial and more conducive to finding mutually agreeable solutions.

What are various challenges faced by Tribunals in India?

- 1. Case Backlogs Rising:** As of 2023, the **Debt Recovery Tribunal (DRT)** has over **215,431 pending cases**, with an asset recovery rate of just **9.2%** in 2022-23, far below the desired efficiency.

2. Mergers and Abolitions Causing Hindrance: The merger of tribunals like **COMPAT** with **NCLAT** has led to overburdened benches and loss of specialization.

3. Lower Vacancies and Poor Infrastructure: Tribunals like **APTEL** face chronic vacancies and lack adequate infrastructure, leading to delays. **NCLT** operated at **50% capacity in 2023**, delaying crucial insolvency resolutions. Many tribunals lack digital case management systems, affecting efficiency.

4. Judicial Overreach: The **Supreme Court's intervention** in the **Telecom Disputes Settlement and Appellate Tribunal (TDSAT)** ruling on the **Adjusted Gross Revenue (AGR)** dispute has raised questions about the legal standing of tribunals.

5. Appointment Concerns: The trend of appointing **retired judges and bureaucrats** raises questions about post-retirement placements and expertise. **E.g. The Ministry of Law and Justice** controls appointments and budgets which reduces the administrative independence.

6. Lack of Uniformity: Different tribunals follow varying procedures, leading to inconsistency. For instance, the **Armed Forces Tribunal (AFT)** and **Central Administrative Tribunal (CAT)** have different rules for evidence submission.

7. Ineffective Implementation: The appointment process for tribunal members is slow and opaque, leading to prolonged vacancies. **E.g. The Law Commission's 272nd Report (2017)** recommended a **central nodal agency**, but no progress has been made.

8. Economic Impact: Delays in tribunal decisions have significant economic consequences. **E.g. unresolved tax disputes worth ₹12 lakh crore** are pending before various tribunals, affecting government revenue and investor confidence.

What is the Way Forward?

1. Establish an Independent Tribunal Oversight Body: Inspired by the National Judicial Appointments Commission (NJAC), a **Tribunal Commission** should oversee appointments, funding, and administration. **E.g. The Law Commission's 162nd Report** suggested a **National Administrative Appellate Tribunal** above High Courts—an idea that needs revisiting.

2. Structured Tribunal Management System: A **Central Tribunal Division** within the Ministry of Law and Justice should be implemented to streamline operations. Case management technology and AI-based analytics should be deployed to track tribunal performance.

3. Implement a Double-Shift System to Expedite Disposal: To clear the backlog, tribunals should operate in two shifts, a proposal discussed in 2011 but never implemented. This would increase case disposals without increasing infrastructure costs.

4. Strengthen the Specialization and Independence of Tribunals: Instead of appointing retired bureaucrats, **tribunals must have domain-specific technical panels** to ensure **subject matter expertise**. Reduce judicial interventions by strengthening tribunal autonomy under the **Tribunals Reforms Act**.

5. Digital Transformation of Tribunals: Fully digitalize tribunal processes through an **e-Tribunals initiative**, ensuring real-time case tracking. Integrate **online dispute resolution (ODR) mechanisms** to reduce case inflow into traditional tribunals. **E.g. The UK's HM Courts & Tribunals Service**.

6. Minimizing Executive Control: The legislature should reduce bureaucratic control over tribunal functioning, as recommended in **Roger Mathew (2019) case**.

7. Enhancing Judicial Autonomy: Ensure tribunals operate with **minimal interference** from higher courts, as emphasized in the **L. Chandra Kumar vs Union of India (1997)** case.

Conclusion: Tribunals thus play a critical role in India's legal system by combining judicial powers with technical expertise to resolve disputes efficiently in domains requiring specialized knowledge. The decisions of these tribunals are generally subject to judicial review by the relevant High Court, and ultimately the Supreme Court. They serve as essential pillars of an effective governance system that requires specialized mechanisms for complex regulatory issues.

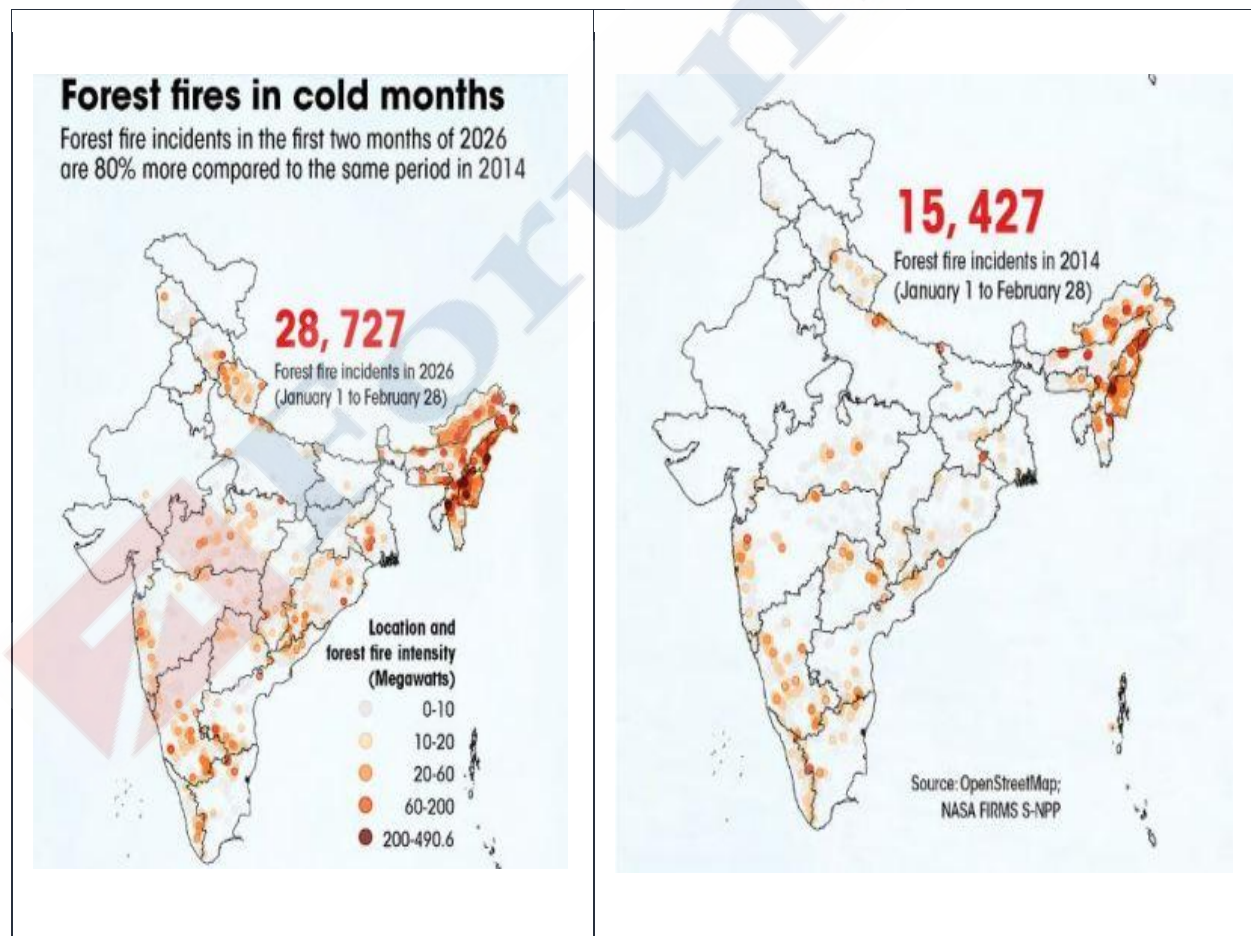
Read more: [The Print](#)

UPSC Syllabus- GS 2– Quasi-judicial bodies

Forest Fires in India- Explained Pointwise

Forest fires in India in the first two months of 2026 have **increased by more than 80%** compared with trends over the past decade since 2014. When compared with 2024, the warmest year on record, fire activity in forested regions was over 50% higher in early 2026.

The concern is not limited to the number of fires alone; the intensity of fires, measured by the rate of thermal energy released by burning vegetation, has also increased compared with previous years.



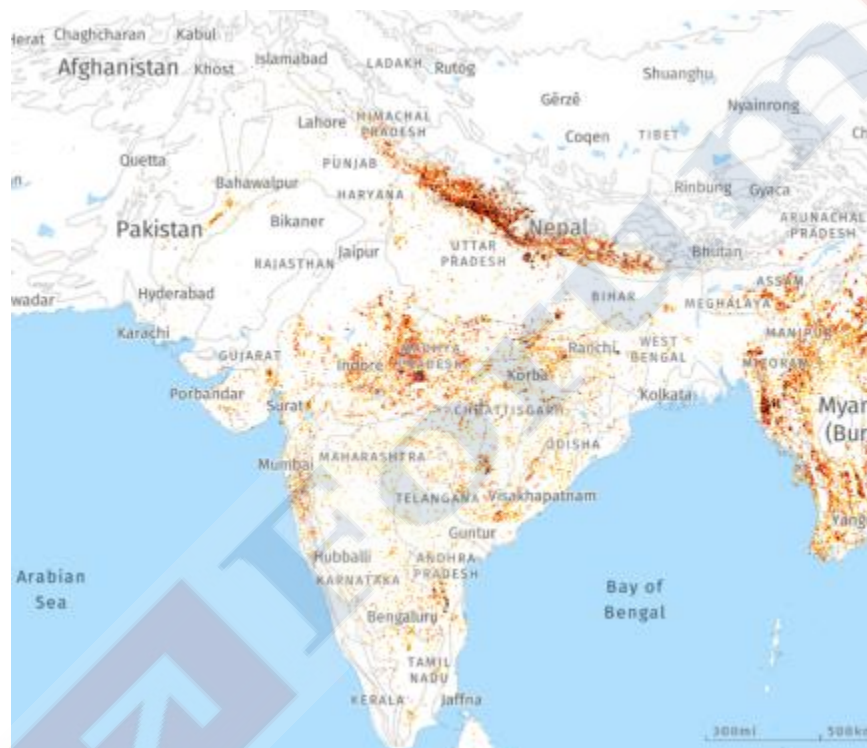
Source- DTE

What is Forest Fire? What is the Status of Forest Fires in India?

Forest Fire- A forest fire is an **uncontrolled fire** that destroys large parts of the forest. November to June is considered to be forest fire season in India. The Peak fire season typically begins in late February and spans about 12 weeks.

Forest Fire Prone Regions:

Historically identified fire-prone areas: According to the India State of Forest Report (ISFR) 2023, India's total forest cover is 7,15,343 sq km, which constitutes **21.76% of the country's geographical area**. Forests in Assam, Mizoram and Tripura have been identified as 'extremely fire-prone'. Dry deciduous forests are highly susceptible to severe fires.



New fire hotspots in 2026:

While North East India has consistently seen the most intense fires, 2026 has seen notable spikes in additional regions – Himalayan states of Himachal Pradesh and Uttarakhand, Odisha in the east, and the Rayalaseema region in southern India.

What are the reasons behind Forest Fires in India?

There are both natural and anthropogenic causes of forest fires in India. These are mentioned below-

Natural Causes

- a. Lightning-** A lightning strikes **power cables, trees, or rocks** can produce a spark triggering forest fires.
- b. Volcanic eruption-** Hot magma in the earth's crust is **usually expelled out as lava** during a volcanic eruption. The hot lava then flows into nearby fields or lands to start wildfires.
- c. Heat patterns-** **Increased temperatures due to global warming** make the forests more vulnerable to forest fires. **Rising atmospheric temperatures** and **dryness (low humidity)** make favourable circumstances for a fire to start.

d. Lack of soil moisture- The dryness in the soil triggers fire in forests. **For ex-** The recent **Uttarakhand wildfires** have been caused due to this.

e. Natural availability of materials triggering forest fire- In India, availability of large quantities of **dry wood, logs, stumps, dead leaves, dry grass** and **weeds** in forest lands are also reasons of forest fires.

Anthropogenic Factors

a. Smoking- Smoking is the leading cause of forest fires globally. **Throwing away the cigarette butts** without completely extinguishing them can lead to wildfires.

b. Campfires- During camping or outdoor activities, people normally leave lit fires or combusting materials unattended. This ignites wildfires.

c. Burning Debris- Wastes and trash on several occasions are burned to ashes as a way of reducing the accumulation of rubbish. This also leads to forest fires in India. **For ex-** **The recent Simlipal Forest fire.**

d. Slash and Burn Cultivation- This is one of the major reason for the fire in India's Northeastern region.

Why peak forest fires occur during the spring?

Spring in India occurs between March and April. In India, the **occurrence of wildfires will be at peak during spring season.** The reasons are as follows-

a. Less rainfall during the winter months- Less rainfall during winter months reduce the soil moisture in forests. The forest soil loses the capacity to control the fire on its own. **For ex-** The **recent Uttarakhand forest fires.**

b. Large availability of combustible materials- The large availability of combustible materials like **dry wood, logs, stumps, dead leaves, dry grass** and **weeds**, increase the intensity of forest fires. Further, strong winds enhance the intensity of forest fires.

What is the Impact of forest fires in India?

a. Loss of Ecosystems and Biodiversity- Forest fires **destroy the habitats and the intricate relationships of diverse flora and fauna**, leading to loss of ecosystems and biodiversity. **For ex-** **Extinction of wildlife in India.**

b. Forest Degradation- Forest fires reduce the quality of certain forest features like soil fertility, biodiversity, and ecosystems.

c. Impact on livelihood- According to the **2011 census, 1.70 lakh villages in India have proximity to forests.** The livelihood of several crores of people is dependent on fuelwood, bamboo, fodder, and small timber. Forest fires directly impact their livelihood.

d. Air Pollution- Forest fires reduce carbon sequestration, and **instigate huge clouds of smoke** leading to massive air pollution.

e. Soil Degradation- Forest fires **kill beneficial soil microorganisms** that are responsible for breaking down the soil and promoting soil microbial activities. Further, the **wildfires also make soils vulnerable to soil erosion.**

f. Destruction of Watersheds- Forest fires lead to the destruction of wetlands of forest, which are protected by the forest.

What are the Government initiatives for forest Fires in India?

Forest Fire Alert System (FFAS)	Forest Survey of India (FSI) developed a Forest Fire Alert System (FFAS). This system has been developed to monitor wildfires in real-time.
MODIS (Moderate Resolution Imaging Spectroradiometer) Sensors	Using these sensors, the real time information on forest is collected and sent to the Forest Survey of India . The FSI forwards the data by email to state, district, circle, division, range and beat levels. People in the locality receive SMS alerts.
National Master Plan for Forest Fire Control	The government prepared the National Master Plan for Forest Fire Control. Under this, the government aims to introduce a coordinated and integrated fire-management programme .

What should be the Way Forward to reduce Forest Fires?

- a. Capacity Development-** Capacity development of forest departments' officials at different **levels (national, regional, local)** to **reduce the vulnerability** of Indian forests fire.
- b. Forest Control Manuals-** Creation of forests fire control manuals for **field staff** helps in early detection, reporting and controlling the fires.
- c. Comprehensive forest fire policy-** A **cohesive policy or action plan** should be formulated to set forth the guiding principles and framework for wildfire Management. The policy should also incorporate the dimension of climate change.
- d. Indigenous knowledge-** Using indigenous knowledge and techniques of **local and tribal people** in comprehensive wildfire management.
- e. Infrastructure creation-** Improving the Staffing and capacity of firefighters in the country. **For ex- Construction of watchtowers and crew stations, hiring seasonal fire watchers to spot fires** etc.
- f. Development of Technology-** Modern firefighting techniques such as the **radio-acoustic sound system** for early fire detection and Doppler radar should be adopted. We must also aim at developing a **National Fire Danger Rating System (NFDRS)** and **Fire Forecasting System** for faster detection and control of fire.
- g. Expanding Monitoring to Emerging Hotspots:** With new fire-intensity spikes recorded in Himachal Pradesh, Uttarakhand, Odisha, and Rayalaseema in 2026, monitoring infrastructure and response capacity must be extended beyond the historically identified Northeast-centric zones

Read More- [DTE](#)

UPSC Syllabus- GS 3- Disaster Management

India's Multi-Hazard Early Warning Decision Support System (MHEW-DSS)- Explained Pointwise

India faces frequent extreme weather events, with over **75% of districts vulnerable to multiple hazards**. To address gaps in forecasting, the India Meteorological Department (IMD) has developed the Multi-Hazard Early

Warning Decision Support System (MHEW-DSS) under **Mission Mausam**, enabling proactive, impact-based early warnings.

This article examines the objectives of MHEW-DSS, its key features, sectoral impact, and limitations.

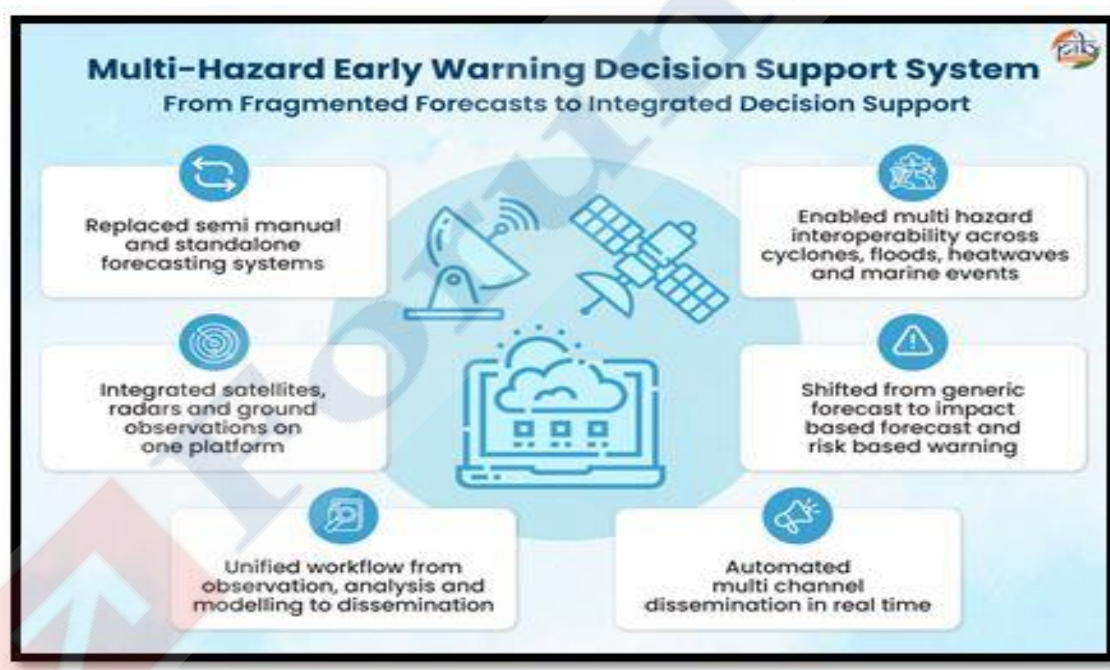
What is MHEW-DSS and what are its core objectives?

MHEW-DSS is an advanced digital forecasting platform developed entirely in-house by the [India Meteorological Department \(IMD\)](#) using open-source technology and domestic expertise. It operates in real time using tools such as **Geographic Information System (GIS) maps** to quickly analyse and share weather information.

It was officially **launched in January 2024** under [Mission Mausam](#) – the Union Cabinet-approved initiative to modernise India's weather forecasting infrastructure.

Background– India is highly vulnerable to climate hazards. **Floods affect around 40 million hectares of land each year**, heatwaves are increasing, and cyclones cause major losses. Earlier forecasting systems were fragmented, slow, and dependent on foreign vendors, reducing timely warnings.

Core Objectives of the MHEW-DSS



Source- PIB

1. Integrated multi-hazard forecasting–To build a **single, unified platform covering all major hazards** including cyclones, floods, heatwaves, thunderstorms, droughts, and landslides, replacing the earlier fragmented, hazard-by-hazard approach.

2. Speed and accuracy–To significantly cut forecast preparation time and improve forecast accuracy so that warnings reach communities when they can still act, not after the event has already begun.

3. Self-reliance and indigenisation- To eliminate dependence on foreign meteorological technology vendors and build a fully indigenous system, aligned with India's broader Atmanirbhar Bharat vision.

4. Universal reach- To ensure that timely, location-specific weather information reaches every household, farmer, fisherman, and emergency responder, embodying the national philosophy of "Har Har Mausam, Har Ghar Mausam."

What are the salient features of the MHEW-DSS?

1. Automated weather data processing- Over 90% of weather data collection, quality checks, and integration are now automated, eliminating manual bottlenecks and enabling near-instant detection of emerging weather threats.

2. Greater use of forecast models- More than 95% of numerical weather prediction (NWP) model inputs are used in forecasting, a sharp improvement over earlier systems where large volumes of model data went unused due to manual processing limitations.

3. Extended forecast lead time- Lead time has been stretched from 5 days to 7 days, giving state governments, district administrations, and communities meaningfully more time to prepare and act.

4. Faster forecast preparation- Time to prepare a forecast has been cut by roughly half, from 6 hours to about 3 hours, enabling warnings to reach the public faster when every hour matters.

5. Impact-based forecasting- Rather than just predicting weather parameters, the system assesses how a weather event will affect sectors like agriculture, health, energy, and transport. Colour-coded risk levels make this information instantly understandable even for non-specialists.

6. Wide population coverage- Impact-based, location-specific warnings now reach nearly 80% of India's population, including communities in neighbouring regions across the North Indian Ocean.

7. Cost savings and self-reliance- The system has generated approximately Rs. 250 crore in cost savings and has fully ended India's dependence on foreign meteorological vendors.

8. Reduced evacuation costs- Improved cyclone landfall forecasting has brought evacuation costs down to one-third of their 1999 levels, a direct result of better 3-5 day ahead predictions by IMD.

What is the institutional framework supporting the MHEW-DSS?

Three institutions form the operational backbone of the MHEW-DSS:

1. Ministry of Earth Sciences (MoES)- It is the nodal ministry responsible for all weather and climate services in India. It oversees IMD and allied research institutions, providing both the policy mandate and scientific oversight that underpin the MHEW-DSS.

2. India Meteorological Department (IMD)- Established in 1875, IMD is India's principal meteorological agency. Under the MHEW-DSS, IMD plays a central operational role by generating real-time forecasts and alerts through integrated digital systems.

3. Mission Mausam- It is the overarching policy and funding framework approved by the Union Cabinet in September 2024. It upgrades observation networks, data assimilation systems, and modelling capabilities that feed directly into MHEW-DSS operations.

Value Addition:

Mausamgram is a hyper-local forecasting portal launched in January 2024 that delivers 10-day, location-specific forecasts across 1.5 lakh pin codes and 6.2 lakh villages. Accessible via the Mausam app, SACHET, and e-Panchayat Seva, it reaches farmers, Krishi Sakhis, and panchayat functionaries through a coordinated inter-ministerial network, ensuring weather information travels from the IMD server to the village chaupal.

How does the MHEW-DSS work? What is its operational architecture?

MHEW-DSS functions through an integrated digital pipeline:

Data collection	Real-time data from radars, weather stations, satellites, ships, and buoys is unified on a single platform.
Analysis & visualisation	The Weather Analysis and Forecast Enabling System (WAFES) , a GIS-based tool, helps analyse data and track hazards in real time.
Model integration	Multiple Numerical Weather Prediction (NWP) models are compared, with best outputs selected using ensemble methods for accuracy.
Impact-based warnings	Forecasts are converted into colour-coded, sector-specific alerts (cyclones, heatwaves, rainfall, etc.).
Dissemination	Alerts are shared via SMS, apps, APIs, Doordarshan, All India Radio, and more.

What has been the sectoral impact of the MHEW-DSS?

1. Cyclone and marine safety- Special **pre-emptive alerts are issued for fishermen** when **wind speeds are forecast to exceed 45 kmph** or seas are expected to turn very rough. During Cyclone Biparjoy (Gujarat) and Cyclone Dana (Odisha), accurate MHEW-DSS forecasts enabled mass evacuations that resulted in zero casualties in both states.

2. Public health- Heatwave forecasts feed directly into Heat Action Plans, enabling early activation of cooling centres and hospital preparedness. Weather data also **supports advance prediction of vector-borne diseases** such as dengue and malaria, helping health authorities pre-position resources before outbreaks peak.

3. Agriculture and farmer incomes- **Twice-weekly agromet advisories guide farmers** on sowing, irrigation, and harvesting decisions. **Farmers who adopted these advisories reported 52.5% higher annual income than those who did not.** If crop-weather advisories reach all rain-fed districts, the estimated annual economic benefit is Rs. 13,331 crore.

4. Energy sector- Forecasts for solar radiation, wind speed, and temperature directly support renewable energy production planning. Automation within the system has also cut energy consumption, saving approximately **2,10,240 kWh annually**.

5. Water resource management- Accurate monsoon prediction and rainfall forecasting support reservoir operations, flood control scheduling, and irrigation planning at the state level. Digital workflows have additionally **saved approximately 63 kilolitres of water annually** by eliminating paper-based chart production.

6. Environment- Digital forecasting has ended manual chart-plotting across 40 IMD offices, **saving 23.4 tonnes of paper annually** and **avoiding 2.57 tonnes of CO₂ emissions**, with associated annual cost savings of approximately Rs. 1.40 crore.

7. Governance and institutional efficiency- Over 200 organisations including NDMA, NDRF, and State Disaster Management Authorities use IMD's applications. Annual manpower savings from digital transformation have reached approximately Rs. 57.6 crore.

What is the national and international significance of the MHEW-DSS?

National significance

1. Atmanirbhar forecasting- MHEW-DSS is **India's first fully indigenous, end-to-end digital forecasting system**, eliminating foreign vendor dependence in a domain critical to national disaster preparedness and food security.

2. Sendai Framework alignment- The system directly operationalises India's commitments under the **Sendai Framework for Disaster Risk Reduction (2015–2030)**, particularly the goal of universal early warning coverage, with India now reaching nearly 80% of its population.

3. Scalable and replicable design- Built on open-source standards, the **system can be extended to cover new hazards**, new regions, and new sectors without structural overhaul, making it a long-term platform rather than a one-time project.

International significance

1. Regional early warning leadership- As a **Regional Specialized Meteorological Centre (RSMC)**, IMD uses MHEW-DSS to provide severe **weather advisories and tropical cyclone forecasting to countries** including **Bangladesh, Sri Lanka, Myanmar, Oman, and the UAE**, making India a first responder for South and South-East Asian climate disasters.

2. Global institutional recognition- The system supports frameworks under the **World Meteorological Organization (WMO)** and the **Economic and Social Commission for Asia and the Pacific (ESCAP)/WMO Panel on Tropical Cyclones**, cementing India's role in global early warning architecture.

3. Awards and recognition- MHEW-DSS has received the **UN Office for Disaster Risk Reduction (UNDRR) Sasakawa Award** for Disaster Risk Reduction 2025, the Award of Excellence at the Digital Transformation Summit 2026, and the Economic Times GovTech Award 2026, establishing India as a globally credible innovator in disaster risk reduction technology.

What are the challenges and limitations of the MHEW-DSS?

1. Last-mile connectivity gaps- In remote tribal, hilly, and deep coastal areas, **poor internet penetration and low smartphone ownership** limit the reach of digital channels like Mausamgram and the Mausam app, risking exclusion of the very communities most vulnerable to climate hazards.

2. Low weather literacy- Colour-coded alerts and sector-specific advisories are only useful if recipients understand them. A **large share of farmers and fishermen still lack the weather literacy** needed to translate a warning into a timely, appropriate action.

3. Observational network gaps- MHEW-DSS outputs are only as reliable as the data feeding them. Gaps in radar coverage, automatic weather station density, and ocean buoy networks, particularly in the North-East, central India, and the deep Indian Ocean, can degrade forecast quality in critical situations.

4. Uneven state-level implementation- The system delivers warnings efficiently at the national level, but converting those warnings into ground-level preparedness action depends on state and district administrative capacity, which varies enormously across India.

What should be the Way Forward?

1. Fill data gaps- Expand radar, automatic weather stations, and ocean buoys in under-monitored regions like the North-East, central India, and the Arabian Sea.

2. Promote weather literacy- Run awareness programmes for farmers, fisherfolk, and panchayats through Krishi Sakhis, Common Service Centres, and Gram Sabhas.

3. Enable offline access- Develop offline versions of Mausamgram and the Mausam app for low-connectivity areas.

4. Integrate with disaster plans- Link MHEW-DSS warnings with State Disaster Management Plans for automatic local action.

5. Use data for adaptation- Share data with local bodies for long-term climate planning.

6. Global outreach- Promote MHEW-DSS in developing countries via platforms like Coalition for Disaster Resilient Infrastructure (CDRI) and Global South initiatives.

Conclusion

Weather warnings matter only if they lead to action. MHEW-DSS shows India can build and scale world-class, indigenous forecasting systems. The key challenge now is last-mile delivery-ensuring farmers, fishermen, and local leaders receive and act on warnings in time, as this will determine India's climate resilience.

Read More: [PIB](#)

UPSC Syllabus: GS 3 – Disaster Management; Science and Technology- Developments and their Applications

Buffer Stock – Significance & Challenges – Explained Pointwise

The buffer stock is a core component of India's food management policy, acting as an economic safety net for both farmers and consumers. It represents the strategic reserve of food grains held by the government to manage shortages, stabilize market prices, and ensure adequate food supply, particularly for vulnerable populations.

Introduction:

- Buffer stock refers to a reserve of a commodity that is used to stabilize price fluctuations and unforeseen emergencies. The **concept of buffer stock was first introduced during the 4th Five Year Plan (1969-74).**
- In India, buffer stocking of foodgrains is conceptually seen as a method to deliver strategic food and agricultural domestic support policies. Through these, the government caters multiple objectives such as providing famine relief, ensuring food security to consumers and providing production incentives to farmers.
- The responsibility for procuring, storing, and distributing the buffer stock lies primarily with the Food Corporation of India (FCI).

Buffer Stock Norms in India:

- The cabinet committee on Economic Affairs fixes the minimum buffer norms on quarterly basis: i.e as on **1st April, 1st July, 1st October and 1st January of every financial year.**
- It is estimated that as on 1st of July 2025, approximately 358 LMT wheat and 377 LMT rice is available in the central pool, against the buffer norms of 275 LMT of wheat and 135 LMT of rice (LMT = Lakh MT).
- The central pool includes Operational Stocks and Strategic Reserves. Operational stocks meet monthly requirements under TPDS. Strategic reserves/food security stocks meet any shortfalls in future procurement.

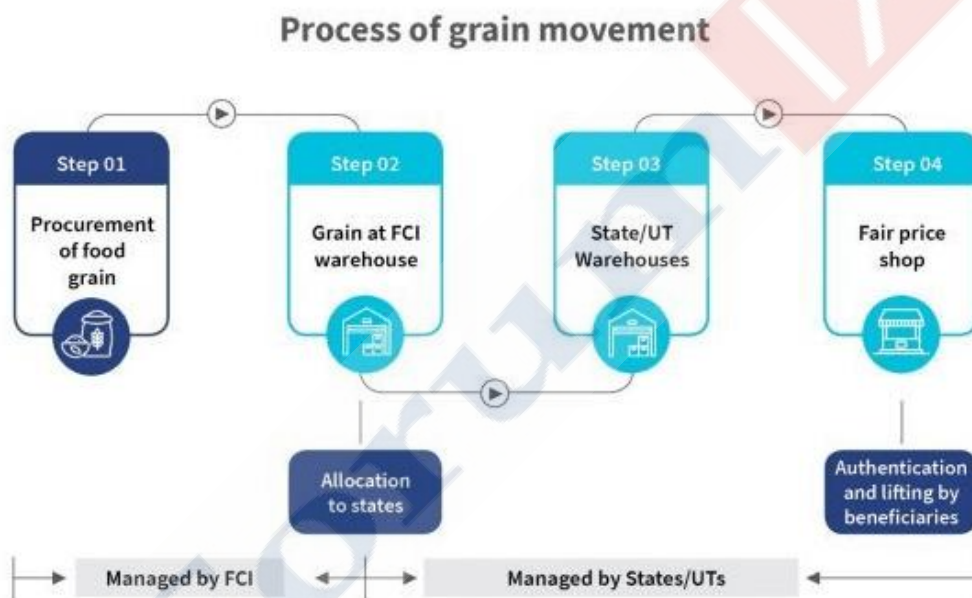
Objectives of Buffer Stock:

Consumption Side	<u>Food Security and Distribution:</u> ● Counter Famine/Shortage: To provide a continuous supply of food grains during periods of crop failure, natural disasters, or other crises where agricultural production falls short. ● Public Distribution System (PDS): To supply grains to the Public Distribution System (PDS) and other welfare schemes (like the National Food Security Act, 2013), ensuring subsidized food reaches the poor.
Production Side	<u>Price Stabilization:</u> ● Price Floor for Farmers: To provide stability by purchasing grains from farmers at the Minimum Support Price (MSP). This guarantees a remunerative price, preventing distress sales and encouraging production.

	● Price Ceiling for Consumers: To control market prices. If open market prices rise too sharply, the government releases grains from the buffer stock to increase supply and bring prices down
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Procurement Process:

1. **Minimum Support Price (MSP):** Before each cropping season (Kharif and Rabi), the government announces the MSP for key crops, including paddy (rice) and wheat.
2. **FCI Purchases:** Farmers sell their produce to the FCI and state agencies at the MSP. This assures farmers of a guaranteed income.
3. **Stock Accumulation:** The procured stock is stored in godowns (warehouses) across the country, managed by the FCI, and is rotated regularly to prevent spoilage.



Significance of Buffer Stock:

1. **Price stabilization:** Buffer stock aims to stabilize the prices of food grains, by regulating their supply in the market. The government intervenes in the market during periods of production fluctuations, natural disasters, or price volatility.
2. **Consumer Protection:** When necessary, the FCI releases stock into the open market through schemes like the Open Market Sale Scheme (OMSS) to cool down inflationary pressure on food prices.
3. **Food security:** Maintaining buffer stocks ensures a sufficient supply of foodgrains to meet the nutritional needs of the population and prevent food shortages. The government releases minimum buffer stock norms to ensure food security. It mitigates the adverse effects of production failures, natural calamities, or unforeseen events on the availability and prices of essential commodities.
4. **Welfare scheme:** The buffer stock serves as the backbone of India's social welfare system. The government utilizes this buffer stock to disperse the foodgrains to more vulnerable segments of the

general public through a public distribution system, at lower than the market value which is otherwise called the issue cost.

5. **Increase farmers income:** By procuring grains at Minimum Support Prices (MSP), buffer stocks provide assured income to farmers, especially during years of excess production. This guarantees that farmers are shielded from price crashes in the open market.
6. **Market Intervention/ Supply Management:** Buffer stocks enable the government to intervene in markets and correct imbalances by releasing grains during supply shortages or surplus production, thereby preventing extreme price fluctuations that can harm consumers or farmers.
7. **Export Opportunities:** Buffer stocks, when managed efficiently, can also create opportunities for exporting surplus grain during years of good harvests, enhancing foreign exchange earnings and ensuring optimal use of excess production for e.g. Surplus wheat from buffer stocks was exported in 2021 to countries in South Asia and Africa, boosting India's presence in global grain markets.

Challenges related to Buffer Stock:

1. **Procurement cost:**
 - There are multiple costs involved in the procurement of buffer stock by FCI, which include handling expenses, storage cost, normal loss, administrative cost, rural development cess.
 - MSP is also being increased by the government which is raising the overall cost of procurement. The food subsidy bill is continuously increasing the burden of buffer stock cost.
2. **Storage Infrastructure:** India's current storage infrastructure is inadequate, with over-reliance on conventional godowns that lead to poor handling and spoilage of grains. The lack of modern silos results in significant post-harvest losses.
3. **High Maintenance Cost:** Maintaining large buffer stocks involves high operational costs, including storage, transportation, and procurement expenses, which put a strain on public finances. These rising costs can make the entire process unsustainable over the long term.
4. **Pilferage and Theft:** The buffer stock system faces challenges of pilferage and theft due to poor security measures and leakages in the distribution network. This results in substantial losses and reduced effectiveness of stock management.
5. **Quality Degradation:** Grains stored for extended periods under poor conditions often suffer from quality degradation, leading to reduced nutritional value. This is particularly an issue with traditional godowns, which lack proper ventilation and protection against pests.
6. **Logistical Challenges:** The transportation and movement of buffer stocks, especially across remote regions, present logistical hurdles. The delay in moving grains from one region to another leads to bottlenecks and mismanagement, affecting timely availability.
7. **Environmental Concerns:** The storage and movement of large buffer stocks also have environmental impacts, including carbon emissions from transportation and the use of non-eco friendly materials in storage.

Way Forward:

1. **Modernization of Storage Facilities:** India should modernize its storage infrastructure with climate-controlled silos to reduce post-harvest losses and maintain grain quality over time for e.g. The government has initiated a pilot project in 11 PACS under its ambitious grain storage plan, aiming to build 700 lakh metric tons of storage capacity over five years with Rs 25 lakh crore investment.
2. **Improved Inventory and Supply Chain Management:** Leveraging digital tools such as blockchain and IoT for real-time tracking of stocks and distribution can ensure efficient management for e.g. The

Smart Warehouse Management System implemented by FCI aims to streamline grain storage and reduce leakages.

3. **Policy Reforms in Buffer Stock Management:** Reforming PDS and buffer stock norms, introducing decentralized procurement and localized storage will enhance the efficiency of stock utilization.
4. **Incentives for Private Sector Participation:** Encouraging public-private partnerships (PPPs) in building modern storage infrastructure and adopting efficient supply chain models can reduce the burden on government agencies and ensure better grain management.
5. **Sustainable and Eco-Friendly Practices:** Adopting green technologies such as solar-powered cold storage and eco-friendly packaging can make buffer stock management more sustainable, reducing its environmental impact.
6. **Enhanced Focus on Regional Disparities:** Addressing regional imbalances in buffer stock storage and distribution is key to ensuring food availability across all parts of India. Establishing regional buffer stock hubs and better connectivity to remote areas will help mitigate logistical challenges.

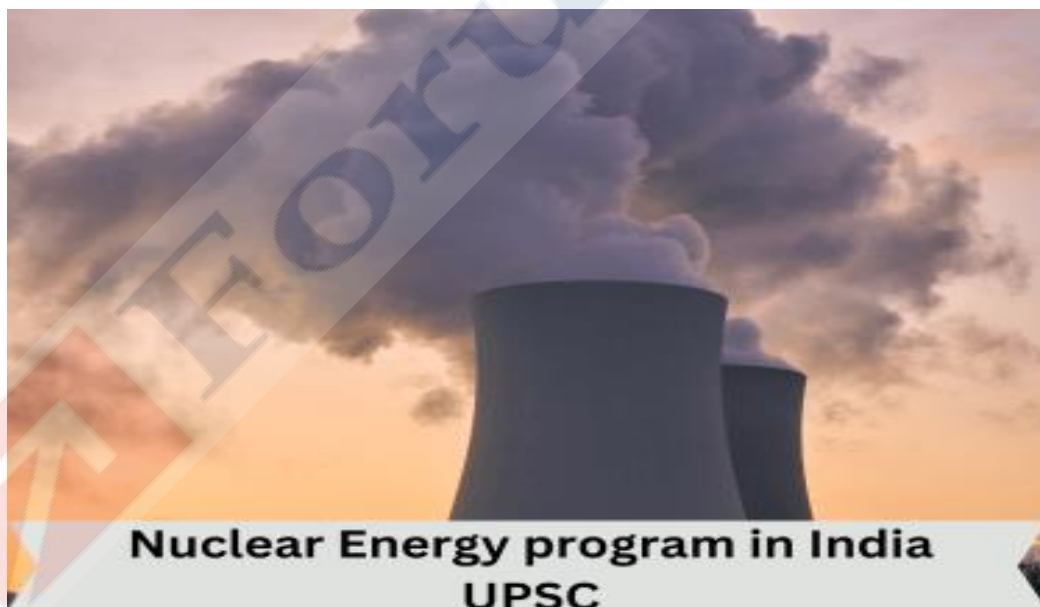
Conclusion:

The future of India's buffer stock system lies in modernization, digital integration, and sustainability. By focusing on reforms, innovation, and eco-friendly practices, the government can overcome existing challenges and transform buffer stock management into a robust and efficient mechanism.

UPSC GS-3: Agriculture

Read More: [Arthapedia](#)

India's Nuclear Energy Program- Explained Pointwise



On April 6, 2026, India achieved a major milestone in its nuclear programme as the **Prototype Fast Breeder Reactor at Kalpakkam, Tamil Nadu reached criticality**-successfully sustaining a controlled nuclear fission chain reaction for the first time.

With this, India joins a select group of nations with advanced fast breeder reactor technology, and once fully operational, it will become only the second country after Russia to run a commercial fast breeder reactor.

Nuclear Energy program in India UPSC



India's 3-Stage Nuclear Energy Program

India starts stage II of the program

STAGE I Aim- Establishment of domestic nuclear power industry Fuel- Uranium Type of Nuclear Reactor- Pressurized Heavy Water Reactors (PHWRs) Working Methodology a. In the Stage-I, India used the Pressurized Heavy Water Reactors (PHWRs) with natural uranium-238 (U-238) as the fuel. The U-238 contained minuscule amounts of U-235, as the fissile material. b. A nuclear fission process is initiated and heavy water (water molecules containing the deuterium isotope of hydrogen) slows the release of neutrons released by one fission reaction enough to be captured by other U-238 and U-235 nuclei and cause new fission. c. The reactions produce fissile Plutonium-239 (Pu-239) and energy.
STAGE II Aim- Development of self-sustaining nuclear fuel cycle. Fuel- Plutonium Type of Nuclear Reactor- Fast Breeder Reactor (PFBR) Working Methodology Only U-235 can sustain a chain fissile reaction. However, it is consumed fully in stage I. Hence, Stage II aims at using the fissile Plutonium-239 (Pu-239) produced as the end product of Stage I with U-238 to produce energy, U-233 and more Pu-239. By the end of the second stage of the cycle, the reactor produces more fissile material than it consumes. Hence, it is called a 'Breeder' reactor. In these 'fast breeder' reactor, the neutrons aren't slowed.
STAGE III Aim- Development of self-sustaining nuclear fuel cycle. Fuel- Plutonium Type of Nuclear Reactor- Fast Breeder Reactor (PFBR) Working Methodology It focuses on combining Pu-239 with thorium-232 (Th-232) in advanced heavy water reactors to produce energy and U-233. This stage uses the naturally available thorium-232 in India and hence will help in achieving nuclear energy self-sufficiency.

Created By Forum IAS

What is India's three-stage nuclear energy program?

Historical Background- The roadmap of India's three-stage nuclear program was envisioned by Dr. Homi J Bhabha. The program had been conceived with the **ultimate objective** of **utilising** the country's **vast reserves of thorium-232**. India hosts roughly **a quarter of the world's thorium**, and the three stages are expected to make the country completely self-sufficient in nuclear energy.

Three-stage Nuclear Energy Program

Stages	Aim	Fuel	Nuclear Reactor
Stage I	Establishment of domestic nuclear power industry	Uranium	Pressurized Heavy Water Reactors (PHWRs)
Stage II	Development of self-sustaining nuclear fuel cycle.	Plutonium	Fast Breeder Reactor (PFBR)
Stage III	Complete energy independence through domestic thorium resources.	Thorium	Advanced heavy water reactors (AHWRs)

Working of 3-Stages



Source- Yojana

Stage I

- In the Stage-I, India used the Pressurized Heavy Water Reactors (PHWRs) with natural uranium-238 (U-238) as the fuel. The U-238 contained minuscule amounts of U-235, as the fissile material.
- A nuclear fission process was initiated and heavy water (water molecules containing the deuterium isotope of hydrogen) slowed the release of neutrons released by one fission reaction enough to be captured by other U-238 and U-235 nuclei and cause new fission.
- The reactions produce fissile Plutonium-239 (Pu-239) and energy.

Stage II

a. Only U-235 can sustain a chain fissile reaction. However, it is consumed fully in stage I. Hence, Stage II aims at using the fissile **Plutonium-239** (Pu-239) produced as the end product of Stage I with U-238 to produce **energy, U-233 and more Pu-239**.

b. By the end of the second stage of the cycle, the reactor produces more fissile material than it consumes. Hence, it is called a '**Breeder**' reactor. In these 'fast breeder' reactor, the neutrons aren't slowed.

Stage III

a. It focuses on **combining Pu-239** with **thorium-232** (Th-232) in advanced heavy water reactors to produce **energy and U-233**.

b. This stage uses the naturally available thorium-232 in India and hence will help in achieving **nuclear energy self-sufficiency**.

What are the important milestone events in India's Nuclear Energy Program?

The establishment of several institutions has played a critical role in driving India's Nuclear Energy Program.

Passive Phase

1945	Tata Institute of Fundamental Research (TIFR) was established by Homi J. Bhabha with the goal of conducting research in fundamental sciences.
1948	The Atomic Energy Commission of India (AEC) was established as a government agency responsible for formulating and implementing the country's nuclear policy.
1954	The Department of Atomic Energy (DAE) was created. It has been engaged in the development of nuclear power technology and applications of radiation technologies in the fields of agriculture, medicine, industry, and basic research.
1957	Atomic Energy Establishment, Trombay (AEET) was established by Dr. Homi Bhabha for a multidisciplinary research program essential for the ambitious nuclear program of India. In 1966, AEET was renamed Bhabha Atomic Research Centre (BARC).
1963	The USA and India sign an accord for the supply of enriched fuel to India's Tarapur nuclear power plant .
1969	Nuclear Power Grid connection was established from the Tarapur Plant .

However, **India did not sign the NPT in 1970, did not become a member of the NSG in 1974**. After **India's first nuclear Test, Smiling Buddha in 1974**, there was widespread condemnation from the international community. There was international apartheid against India in supply of nuclear fuel.

Active Phase

1987	Nuclear Power Corporation of India Limited (NPCIL) was established as a public sector undertaking responsible for the generation of electricity from nuclear power.
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2003	Bharatiya Nabhikiya Vidyut Nigam Ltd. (BHAVINI) was set up by the Department of Atomic Energy (DAE) as a special-purpose vehicle to implement stage II of the 3-stage nuclear power program.
2022	22 operational reactors in India with a total installed capacity of, 6780 MWe (Megawatts electric). 10 nuclear power reactors with a total of 8000 MW capacity are under construction.
2024	PM Modi witnessed commencement of core loading at the 500 MWe PFBR at Kalpakkam – marking the formal start of Stage II. Atomic Energy Regulatory Board (AERB) subsequently granted permission for the “First Approach to Criticality,” approving final fuel loading and Low Power Physics Experiments.
2025	a. The SHANTI Act, 2025 received Presidential assent on 20 December, replacing the Atomic Energy Act, 1962 and the Civil Liability for Nuclear Damage Act, 2010, and enabling private sector participation in nuclear power. b. The Atomic Energy Regulatory Board (AERB) granted approval for fuel loading of the PFBR at Kalpakkam as part of its commissioning process.
2026	PFBR at Kalpakkam achieved criticality on 6 April, sustaining a controlled fission chain reaction for the first time.



Source- World Nuclear Association

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What are the advantages of India's Nuclear Energy Programme?

1. Energy Sovereignty- Fossil-based energy sources contributed about 82% of the primary energy supplied in 2021. India imports a significant part of its fossil fuels (coal and gas) for energy generation. Bulk fuel imports raise economic and strategic vulnerabilities for a developing country like India. Nuclear energy can help India reduce its dependence on imported fuel.

Fuel	Consumption (EJ)	Percentage	Combined Percentage
Oil	184.21	30.95	82.28
Natural Gas	145.35	24.42	
Coal	160.10	26.90	
Nuclear Energy	25.31	4.25	17.72
Hydroelectricity	40.26	6.76	
Renewables	39.91	6.71	
Total	595.14	100.00	100.00

Source- NITI Aayog

2. Decarbonisation of power Sector- Thermal power plants have high carbon footprint as they contribute heavily to global warming, climate change and air pollution. Nuclear power plants will help in decarbonising the power sector.

3. Limitations attached with other renewable energy sources- Solar energy is land intensive, wind energy requires energy storage systems. Also, they require imported technologies and materials such as photovoltaic cells, batteries, and storage equipment. On the other hand, indigenous nuclear reactors have reduced dependency in critical imports.

4. Cheaper to Operate- Nuclear power plants are cheaper to operate than coal or gas plants, despite the cost of managing radioactive fuel and disposal. According to estimates, nuclear plants cost only 33-50% of a coal plant and 20-25% of a gas combined-cycle plant.

5. Reliable and Continuous Power- Nuclear energy provide reliable and continuous base load power, unlike solar and wind energy, which are intermittent and dependent on weather conditions.

6. Resource Base- India has vast thorium reserves which could be exploited using a thermal breeder reactor. A significant amount of thorium reserves are found in the monazite sands of coastal regions of South India.

What are the challenges to India's Programme?

1. Capital Intensive- Nuclear power plants are capital intensive. There have been cost over runs in recently built nuclear power plants.

2. Insufficient Installed Capacity- As of 2025-26, India's installed nuclear power capacity is about 8,780 MW across 24 reactors, against a target of 100 GW by 2047 under the Nuclear Energy Mission.

3. Nuclear Safety- Local communities in India have been resisting nuclear reactors due to fears of nuclear disasters like **Chernobyl, 1986** or **Fukushima, 2011**. **For ex-** Locals **protesting against the Mithi virdi nuclear project** in Gujarat.

4. Nuclear Liability- Civil Liability for Nuclear Damage Act, 2010 had been a long-standing deterrent to foreign suppliers due to unlimited supplier liability. The SHANTI Act, 2025 now replaces it with a graded, capped liability framework – removing automatic supplier liability and introducing tiered operator caps based on reactor size. However, opposition parties have raised concerns about dilution of supplier accountability.

5. Hurdles created by NSG and NPT- India's non-ratification of NPT and lack of NSG membership, has created **diplomatic hurdles** in **accessing more nuclear fuel** and **better nuclear technologies**.

6. Use of outdated Technology- Currently operational Indian nuclear reactors have become outdated and suffer from multiple operational problems. **For ex-** **6 VVER (water-water energy reactor) design reactors** **encountering operational problems at Kudankulam**.

What should be the way Forward?

1. Small Modular Reactors (SMRs)– Indigenous Small Modular Reactors (SMRs) must be built at **coal plant sites which would be retiring** in the coming decades. SMRs offer the advantages of being **safe, economical, compact** and **adaptable**. Partnerships with NTPC and other thermal plant owners must be explored.

2. Expansion of indigenous PHWR reactors- The Indigenous 700 MWe PHWR, must be expanded in fleet mode to add to the installed nuclear power capacity in India.

3. Scale up the Fast Breeder Reactor programme – With the PFBR achieving criticality in 2026, two additional FBRs must now be constructed at Kalpakkam, followed by four more beyond 2030. This will consolidate Stage II and generate sufficient U-233 from thorium blankets to fuel Stage III reactors.

4. Accelerate Stage III – Advanced Heavy Water Reactor (AHWR) – Design validation and peer review of the AHWR is ongoing. The project must be formally launched at the earliest to utilise India's vast thorium reserves, estimated to sustain energy needs for around 60,000 years.

5. Augmentation of safety of nuclear facilities- There must be constant updation of **safety skills of nuclear operators**. Further, masses must be comprehensively sensitised about the functioning of nuclear power plants using highly **intellectual individuals having mass appeal**. **For ex-** **Dr. APJ Abdul Kalam sensitizing the masses** before the establishment of the Kudankulam nuclear power plant.

6. Ensuring Regulatory Autonomy- The AERB, India's nuclear regulatory body, must be provided functional autonomy by **removing its reporting from the Department of Atomic Energy (DAE)**.

Read More- [IE](#)

UPSC Syllabus- GS 3- Science and Technology, Indigenisation of technology

Food Processing Sector-Significance and Challenges- Explained Pointwise

India with its agricultural tradition and diverse climate, holds **immense potential for the food processing sector**. This industry is not only a cornerstone for the country's economic growth but is also pivotal for ensuring food security, reducing wastage, enhancing farmers' incomes and providing employment opportunities. In order to achieve a developed nation status in the next 25 years, the food processing sector would be **crucial in transforming India's primary agriculture sector** with enhanced productivity and profitability while ensuring sustainability and resilience.



Source- Yojana

What is Food Processing? What are the reasons behind its growing Demand in India?

Food processing is the **transformation of raw agricultural ingredients – such as crops, livestock, or fish – into food** that is suitable for consumption, cooking, or storage. It extends the shelf life of food, reducing waste and ensuring availability throughout the year.

Food processing sector has been recognized as a '**sunrise sector**' and a key priority industry under the '**Make in India**' initiative.

Type of Food Processing: The can be categorized into **primary** and **secondary** products:

1. **Primary products** are made from processed raw materials, like **fruits** and **vegetables**.
2. **Secondary products** are created by processing primary food items into new products, such as **jams**, **saucers**, and **butter**.

Main reasons behind the Growth of Food Processing sector in India:

1. Changing Consumer Demographics & Lifestyles:

- a. **Urbanization:** Rapid urban migration has led to busier lifestyles, increasing the demand for **Ready-to-Eat (RTE)** and **Ready-to-Cook (RTC)** meals.
- b. **Rising Disposable Income:** A growing middle class has more "wallet share" to spend on premium, branded, and packaged health foods.

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- c. **Health Consciousness:** There is a significant surge in demand for organic, functional (ayurvedic/herbal), and fortified foods.

2. Strong Agricultural Foundation:

- a. **Raw Material:** India is a global powerhouse in raw material production, providing a steady supply for processing. India is the world's largest producer of milk and the second-largest producer of fruits, vegetables, cereals, and fish.
- b. **Diverse Agro-Climatic Zones:** India's 15 different agro-climatic zones allow for the cultivation of almost any vegetable or fruit year-round, ensuring a consistent supply of raw ingredients.

3. Government Policy Support:

- a. **Sunrise Sector:** The Government of India has classified food processing as a "Sunrise Sector," backed by massive financial outlays.
- b. **PMKSY (Pradhan Mantri Kisan Sampada Yojana):** This "umbrella" scheme focuses on modernizing supply chains and creating "Mega Food Parks" to reduce post-harvest losses.
- c. **PMFME Scheme:** Aimed at the **Micro** level, this scheme helps 200,000 unorganized units transition into the formal sector through credit-linked subsidies and technical training.
- d. **PLI Scheme:** The **Production Linked Incentive (PLI)** scheme, with an outlay of ~**₹10,000 crore** rewards companies for increasing their manufacturing output and promoting Indian brands abroad.
- e. **100% FDI:** The government allows 100% Foreign Direct Investment (FDI) under the automatic route for food processing, attracting global giants like Nestlé, PepsiCo, and Danone.
- f. Proactive government policy & assistance with government interventions like **Mega Food Park Scheme**.

4. Technological & Infrastructure Advancements:

- a. **Cold Chain Revolution:** Massive investments in integrated cold chains and "Multi-Product Food Irradiation Units" are extending the shelf life of perishables.
- b. **e-Commerce:** The explosion of **Quick-Commerce (Q-Commerce)** and e-commerce platforms has shortened the "farm-to-fork" journey, giving processed food brands direct access to consumers.

5. Export Opportunities:

- a. **Global Demand:** There is a high demand for Indian processed foods (like spices, basmati rice, and marine products) in the Middle East, Southeast Asia, and the West.
- b. **Trade Agreements:** Recent trade deals with the UAE, Australia, and the EFTA are opening up duty-free or reduced-tariff access to new markets.

What is the significance of Food Processing Sector?

1. Increased Contribution to GDP: The food processing sector has emerged as an **important segment of the Indian economy in terms of its contribution to GDP**. During the last 5 years the sector had grown at an **average annual growth rate of around 8.3%** as compared to around **4.87% in the agriculture and allied sectors** (at 2011-12 prices).

Table 1: GVA by Food Processing Industries (FPI) at Constant Prices (2011-12)

(₹ lakh cr.)

Sr.	Economic activity	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
1	GVA-All India	85.46	90.64	97.12	104.92	113.28	120.34	127.34	132.19	125.85
2	GVA Manufacturing	14.87	15.61	16.84	19.04	20.55	22.09	23.29	22.61	22.48
3	GVA-Agriculture, Forestry, Fishing	15.24	16.09	16.06	16.16	17.26	18.40	18.79	19.82	20.48
4	GVA-FPI	1.30	1.30	1.34	1.61	1.79	1.93	2.36	2.26	2.37

Source: Annual Report 2022-23, MoFPI, GoI

Source- Yojana

2. Employment Generation: This sector is a major employment generator in the country. As per the latest **Annual Survey of Industries (ASI)** for 2019-20, the total number of persons engaged in the registered food processing sector was **20.32 lakhs**. Moreover as per the NSSO 73rd Round, 2015-16, the unregistered units of the sector supported employment for 51.11 lakh workers and constituted 14.18% of employment in the unregistered manufacturing sector.

Table 4: Number of Persons Engaged in Food Processing Sector

(lakh persons)

Sector	Food Processing Industry*	All Industries	(%) Share of FP sector
Registered (2019-2020)	20.32 lakh	166.21 lakh	12.22
Un-incorporated	51.11 lakh	360.41 lakh	14.18

Source: Annual Report- FY 2022-23, MoFPI, GoI, *includes food products and beverage segments

Source- Yojana

3. Large FDI inflow and market size: FDI equity inflows into the food processing sector reached \$3.28 billion between 2019-2022. It is the fifth largest sector of the country's economy.

4. Promotes balanced regional development: This industry is a sunrise industry with a consistent demand for locally processed food. This **promotes balanced regional development in the country**.

5. Women entrepreneurship: The sector provides employment opportunities to rural women in India and also serves as a platform for entrepreneurship. **For ex- Lijjat papad venture.**

6. Nutritional Improvement: Processed foods can be **fortified with essential vitamins and minerals**, thereby **addressing malnutrition** and improving public health outcomes.



Source: PIB

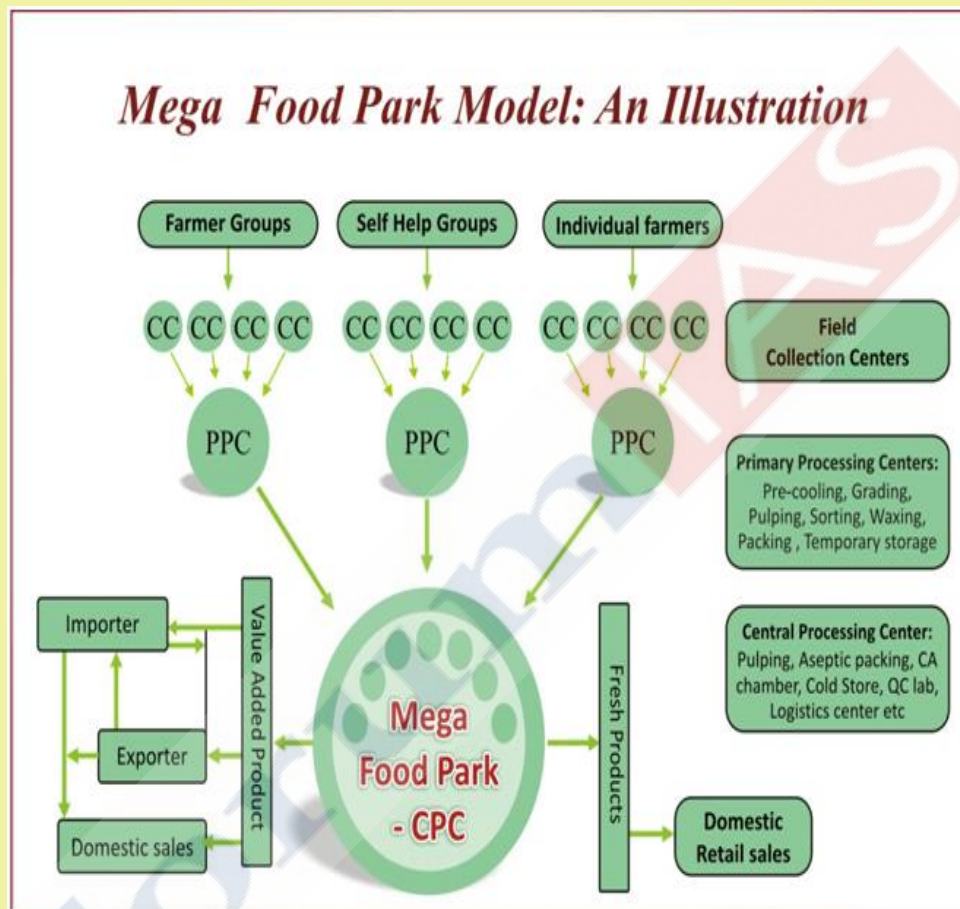
What are the Government schemes and initiatives for promotion of Food Processing Sector in India?

Pradhan Mantri Kisan Sampada Yojana (PMKSY)	This Central Sector Scheme is being implemented across the country to facilitate the creation of modern infrastructure with efficient supply chain management from farm gate to retail outlet for promotion. Key Sub-Schemes under PMKSY: 1. Mega Food Parks: Provides state-of-the-art infrastructure for food processing units. Out of 41 approved, 24 are now fully operational. 2. Integrated Cold Chain & Value Addition: Focuses on reducing post-harvest losses. 3. Agro-Processing Clusters: Creates modern infrastructure for groups of entrepreneurs. 71 clusters have been approved to date. 4. Food Safety & Quality Assurance: Includes setting up NABL-accredited food testing labs to ensure international standards. It has directly benefitted over 53 lakh farmers & >7.6 lakh employment opportunities have been created.
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<u>Pradhan Mantri Formalization of Food Processing Enterprises (PM-FME)</u>	It was launched in June 2020 under Atmanirbhar Bharat Abhiyaan to encourage 'Vocal for Local' in the sector with a total outlay of Rs. 10,000 crore during the period 2020-2025. The scheme aims to enhance the competitiveness of individual microenterprises in the unorganised segment of the food processing industry and promote formalisation of the sector. This is the first ever Government scheme for Micro Food Processing enterprises and is targeted to benefit 2 lakh enterprises through credit linked subsidies and adopting the approach of 'One District One Product'.
Food Processing Fund	The Government of India instituted the Food Processing Fund (FPF) in NABARD during 2014-15, with a corpus of Rs. 2,000 crore, with the objective of providing affordable credit to public and private players for setting up of Designated Food Parks (DFPs)
Warehouse Corpus Fund	The fund was set up corpus of Rs. 5000 crore to support State governments, State-owned agencies, and Corporates for the creation of scientific warehouse capacity through financial support.
<u>Production Linked Incentive Scheme for Food Processing Sector (PLISFPI)</u>	PLI scheme for Food Processing Sector was launched with the aim to generate employment for approximately 2.5 lakh persons in formal sector. The scheme has led to the creation of 3.3 lakh jobs & added more than 67 lakh metric tonnes of processing capacity.

Mega Food Park Scheme

Mega Food Parks are built on a 'cluster' strategy and focus on the development of cutting-edge support infrastructure in a well-defined agri/horticultural zone for the establishment of **modern food processing units**.



Source: MoFPI

Union Budget 2024-25

Announced the establishment of 50 **multi-product irradiation units** to reduce post-harvest losses & enhance shelf life, **100 NABL-accredited food testing laboratories** to strengthen quality assurance across the value chain & establishment of **National Makhana Board** – aimed at boosting value addition, branding, and global positioning of Makhana from India.

What are the Challenges faced by the Sector In India?

- 1. Low GVA despite high demand:** Despite the increasing demand for processed food and ready-to-eat food in India, the share of the sector in overall GVA has only been **1.88%** (2020-21) **as against the share of manufacturing at 17.86%** and the share of GVA in agriculture at **16.26%**.

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2. **Lack of skilled manpower and modern technology:** The availability of skilled manpower has been identified as one of the major challenges facing the industry in India. Many processing facilities use outdated technologies, reducing efficiency and product quality.
3. **Infrastructure Bottlenecks:** Inadequate cold storage facilities, transportation systems, and processing infrastructure result in **post-harvest losses exceeding 30% of produce**. The NITI Aayog estimates annual post-harvest losses close to Rs 90,000 crore.
4. **Informalization and Unorganized Segments:** The sector has a **high concentration of unorganized segments**, representing almost **75% across product categories**. This causes inefficiencies in the production system.
5. **Supply Chain Inefficiencies:** Fragmented supply chains with multiple stakeholders and poor coordination lead to delays, waste, and low quality products. **For ex-** Broken supply chain in the agricultural hinterland of Bihar.
6. **Regulatory Challenges:** Stringent sanitary and phytosanitary (SPS) measures in export markets impede Indian processed food exports. **For ex- Rejection of Indian processed exports by the EU.**

Read More- [\[Kurukshetra Feb 2024 Summary\] Food Storage Infrastructure- Explained Pointwise](#)

What Should be the Way Forward?

1. **Use of Smart technologies:** Internet of Things (IoT), Artificial Intelligence (AI) Applications, **Robotics** and Automation should be used in the food processing sector to increase productivity and decrease wastage.
2. **Focus on horticulture and animal products:** Special focus must be put on making India a market leader in global trade for at least five value chains - **processed fruits and vegetables, processed fish and sea food, meat, dairy products, poultry and eggs** by 2047.
3. **Skilled Manpower:** The food sector must employ more professionals **trained in food technology, quality control, processing methods, and food safety management**.
4. **Better health markers:** It must involve better health markers on the packets. The regulatory mechanism governing food safety must be strengthened and properly governed.
5. **Tapping the popularity of agricultural products:** There is also a need to tap the popularity of various food grains and **coarse grains like millets** which are gaining increasing importance due to their nutritional benefits and adaptability to various climatic conditions.

Conclusion:

The food processing sector is pivotal for India's economic transformation, farmer income enhancement, reduction of food waste, and rural employment generation. It has the most profound impact on the rural economy. With sustained focus on infrastructure, technology, formalization, and market linkages, India is well-positioned to unlock the full potential of this "sunrise industry" and emerge as a global food processing hub.

Read More: [PIB](#), [Wikipedia](#)

Yojana articles Covered- Article 1, 3, 4, 6, and 7

UPSC Syllabus- GS 3- Indian Agriculture

ARTEMIS PROGRAM – Objective & Significance – Explained Pointwise

The Artemis-2 Mission sent a crew of 4 astronauts beyond low-earth orbit for the first time since 1972. It aims to prove the whole system works as designed & accelerate plans to land U.S. astronauts on the moon amid increasing competition from China.



What is the Artemis Program?

- The **Artemis Program** is a NASA-led international human spaceflight program designed to return humans to the Moon for the first time since the **Apollo 17 mission** in 1972, and ultimately establish a sustainable presence there as a stepping stone for future missions to Mars.
- Artemis was the name of goddess of Moon in Greek mythology – who is the twin sister of **Apollo**, after which NASA's 1960s moon landing program was named.
- **Core Components of Artemis Program:**
 - 1. Space Launch System (SLS):** The most powerful rocket ever built by NASA, designed to carry heavy payloads beyond Earth's orbit.
 - 2. Orion Spacecraft:** The command capsule where astronauts live and work during their journey.
 - 3. Human Landing System (HLS):** NASA has contracted private companies – specifically **SpaceX** (using a modified Starship) and **Blue Origin** – to build the landers that will actually touch down on the Moon.

Artemis Accord:

- The international collaborations under the Artemis program are bound by the Artemis Accord.
- They are a set of **non-binding, practical principles** created by NASA and the U.S. Department of State to guide international cooperation in the civil exploration and use of the Moon, Mars, comets, and asteroids for peaceful purposes.
- The Accords reinforce the **Outer Space Treaty of 1967** and other international agreements. Their goal is to establish a shared political understanding of responsible behavior to ensure a safe, predictable, and sustainable space environment for all.
- Launched on **2020**, with eight founding nations, they now comprise **59 signatories** (including the U.S.) representing nearly 30% of the world's countries.

- **Missions under Artemis Program:**

Mission	Launch	Goal
Artemis-1	2022	Uncrewed lunar orbit and return.
Artemis-2	2026	Crewed lunar flyby
Artemis-3	2027	Crewed test of HLS in low Earth orbit
Artemis-4	Early 2028	Lunar landing
Artemis-5	Late 2028	Begin Moonbase construction

What are the objectives of Artemis Program?

1. **Land the First Woman and First Person of Color on the Moon:** This is a central symbolic and inclusive goal of the program.
2. **Establish a Long-Term Lunar Presence:** Unlike the brief Apollo visits, Artemis aims to build a base camp on the lunar surface and the **Lunar Gateway** (a small space station orbiting the Moon) for extended missions.
3. **Preparation for Mars:** The Moon serves as a proving ground for the deep-space technologies, habitats, and life-support systems needed for future crewed missions to Mars.
4. **Enable Lunar Resource Utilization:** Investigate and use lunar resources (e.g., water ice at the south pole) for oxygen, drinking water, and rocket fuel to make missions more sustainable.

What is the significance of Artemis Program?

1. **Scientific & Resource Discovery:**

- a. **Unlocking Lunar Water Ice:** Previous missions (like Apollo) landed near the equator. Artemis is targeting the **lunar south pole**, where scientists believe there are vast deposits of water ice in permanently shadowed craters. This water can be used for drinking, oxygen, and rocket fuel.

- b. **Understanding Earth-Moon History:** The Moon acts as a “time capsule” for the early solar system. By studying its geology, especially in unexplored polar regions, scientists can learn more about the formation of Earth and the Moon.
 - c. **Astronomy:** The far side of the Moon is radio-quiet, free from Earth’s interference. Artemis will help deploy telescopes that can “see” the early universe in ways impossible from Earth.
- 2. **Economic & Technological Significance:**
 - a. **Public-Private Partnership:** The program aims to kickstart a new commercial market. NASA is buying services (like lunar landers and rovers) from private companies (SpaceX, Blue Origin, etc.), incentivizing innovation and reducing costs.
 - b. **Resource Utilization (ISRU):** For the first time, we will attempt to *live off the land* (In-Situ Resource Utilization). If we can mine lunar ice for fuel, the Moon becomes a **gas station in space**, dramatically lowering the cost of going to Mars and beyond.
- 3. **Geopolitical & Strategic Significance:**
 - a. **Setting the Rules of the Road:** Through the **Artemis Accords**, the U.S. and its allies are establishing norms for peaceful space exploration, resource extraction, and “safety zones” to prevent conflict. This counters other nations’ (e.g., China/Russia) visions for lunar governance.
 - b. **Preventing a Second “Moon Race” Turned Conflict:** By making Artemis an international coalition (59+ nations), it transforms space into a zone of cooperation rather than confrontation.
- 4. **The “Stepping Stone” to Mars:** The Moon is a proving ground just **3 days away** from Earth. Mars is **6-9 months away**. Artemis allows us to test everything we need for Mars in a nearby, relatively safe environment:
 - a. **Habitation:** Can humans live in deep space for months at a time on the Lunar Gateway?
 - b. **Health:** How do we handle radiation and microgravity effects beyond low-Earth orbit?
 - c. **Landing:** Can we land heavy payloads precisely on another body?
 - d. **Refueling:** Can we make rocket fuel off-world?

Artemis is the essential training ground for the ultimate goal: **putting humans on Mars**

What are the challenges & criticisms faced by the Program?

- 1. **Significant Schedule Delays:** The program is roughly eight years behind its original targets. The first crewed landing, initially planned for 2024, has slipped to no earlier than 2028, and experts warn that even this date may be optimistic.
- 2. **Budgetary Challenges:** Between 2012 and 2025, NASA spent approximately \$93 billion on the Artemis program. The projected costs through 2030 for the Human Landing System alone exceed \$18 billion.
- 3. **Accelerating a Geopolitical “Race”:**
 - a. The Artemis Accords, which govern the program’s international cooperation, have been criticized for excluding major space powers like **China and Russia**.
 - b. There is a growing push to accelerate the lunar landing timeline to “beat China” to the Moon. Critics argue that this focus on being first – reminiscent of the Cold War-era Space Race – risks repeating the mistakes of the Apollo program, which faded once the political goal was achieved.

4. **Cost Comparison:** Some analysts argue that Starship could eventually launch for a fraction of the cost of the SLS. This has led to political pressure on NASA to justify why it continues to fund its own massive rocket rather than relying entirely on commercial providers.
5. **The “Ownership” Debate:** The **Outer Space Treaty (1967)** states that no nation can claim “sovereignty” over the Moon. Critics and legal experts argue that a permanent Artemis base and the extraction of lunar resources (like water ice) could be seen as a form of illegal “appropriation” or land-grabbing.

Read more: [The Hindu](#), [Wikipedia](#)

UPSC GS-3: S&T

Jan Vishwas Bill – Explained Pointwise

The Jan Vishwas (Amendment of Provisions) Bill has recently been passed by the Parliament. The enactment of the Bill has signaled a decisive move from a regime of excessive criminalisation to one rooted in trust-based governance, ease of doing business, and proportional regulation.

Source: Times of India

What is the Jan Vishwas Bill?

- The Bill builds on the earlier Jan Vishwas (Amendment of Provisions) Act 2023 (which decriminalized 183 provisions across 42 Central laws), as decriminalizes 717 provisions across 79 Central Acts.
- The Bill's main objective is to decriminalize minor offences that do not involve harm to public interest or national security, and replace criminal penalties with civil penalties or administrative actions.
- The Bill also introduces amendments aimed at **improving ease of living**, including reforms under the **Motor Vehicles Act, 1988** and the **New Delhi Municipal Council Act, 1994**.
- It **reduces compliance burden for MSMEs** and businesses by introducing graded enforcement such as advisory notices and warnings before penalties.

What are the objectives of the Bill?

1. **Intent Matters:** The Bill seeks a principled separation between conduct that warrants criminal sanction, such as fraud, willful evasion, and threats to public safety, and procedural non-compliance that carries no comparable moral charge.
2. **Equity:** Smaller enterprises & MSMEs are disproportionately exposed to compliance risks, not because they violate laws more often, but because they lack the capacity to absorb the consequences when doing so. The Jan Vishwas Bill aims to make the compliance simpler – especially for MSMEs.
3. **Warning before Punishment:** First-time and minor lapses are addressed through warnings rather than immediate penalties, providing citizens and businesses a fair opportunity to comply.
4. **Proportionate Penalties:** Penalties are calibrated to the severity of the offence, ensuring fair, balanced, and just enforcement.
5. **Faster and Fair Resolution:** Dedicated adjudicating officers and appellate authorities enable swift and transparent resolution, while reducing the burden on courts.

6. **Dynamic Penalty Framework:** Penalties are subject to periodic revision, ensuring that enforcement remains effective, relevant, and responsive over time.

What are some of its important provisions?

1. **Decriminalising offences:** The Bill decriminalises several offences, and instead imposes civil penalty for such offences. For e.g. under the **Drugs and Cosmetics Act, 1940**, manufacturing and sale of cosmetics in contravention of the Act is punishable with imprisonment up to one year, a fine up to Rs 20,000, or both. The Bill instead imposes a civil penalty of one lakh rupees or three times the value of cosmetics confiscated, whichever is higher.
2. **Removal of imprisonment term:** In some cases, the Bill removes the imprisonment term for an offence. For e.g. under **Indian Succession Act, 1925**, failure to surrender revoked probate or letters of administration is punishable with imprisonment up to three months, a fine, or both. The Bill instead imposes only a fine, and also increases the maximum amount of fine.
3. **Omission of offences:** The Bill removes several offences. These include offences such as:
 - Giving false alarm of fire under the **Delhi Police Act, 1978**.
 - Failure to give information of births and deaths under the **Delhi Municipal Corporation Act, 1957**.
 - Making false entries in the register of copyrights under the **Copyright Act, 1957**.
4. **Revision of fines and penalties:** The Bill revises the monetary value of fines and penalties for several offences. It further provides that fines and penalties specified by it will increase by 10% of the respective minimum amount every three years.
5. **Warnings on first and second offences:** The Bill amends some Acts to provide for advisories or warnings in the first or second instances of an offence. For e.g. under **Apprentices Act, 1961**, offences punishable with fines include refusing to furnish information, and requiring an apprentice to work overtime. The Bill provides that an advisory will be issued for the first contravention, and a warning will be issued for the second contravention. A civil penalty will be imposed for subsequent contraventions.
6. **Improvement notices:** The Bill introduces improvement notices under the **Legal Metrology Act, 2009**. Under this Act, several offences, such as manufacturing, using, or selling non-standard weights and measures, are punishable with fines. The Bill instead provides that an improvement notice may be issued in case of the first offence. Such notices require rectifying non-compliance within a specified time. In certain cases, a civil penalty will be imposed for the second offence, and subsequent offences will be punishable with a criminal fine.
7. **Adjudication of penalties:** The Bill amends certain Acts to provide for the appointment of adjudicating officers to hold inquiries and adjudicate penalties. It also provides for appointment of appellate authorities to hear appeals against decisions of adjudicating officers.
8. **Property tax and advertisement tax in New Delhi municipal area:**
 - The Bill amends the **New Delhi Municipal Council Act, 1994**. The Act provides for the levy of property tax. The Bill specifies that property tax will consist of a building tax and a vacant land tax.
 - It establishes a **Municipal Valuation Committee** to recommend base value for vacant lands and buildings, and manner of determining and revising property tax.
 - The Bill sets up a **Hardship and Anomaly Committee** to address grievances regarding property tax.
9. **Manner of revision of fines and penalties under Jan Vishwas Act of 2023:** The Jan Vishwas (Amendment of Provisions) Act, 2023 provides for revision of fines and penalties specified by it every

three years. The Bill adds that if any Act already prescribes its own method of revision, the method in that Act will apply.

What is the significance of the Bill?

1. **Ease of Doing Business:** The primary goal is to reduce the “compliance burden” that often stifles entrepreneurship, especially for **MSMEs**.
2. **Reduced Litigation Costs:** Small businesses often spent more on legal fees than the actual fines. Moving these cases to **Adjudicating Officers** instead of criminal courts makes resolution faster and cheaper.
3. **Reducing Burden on Judiciary:** India’s district & subordinate courts carry over 4.8cr pending cases (NJDG, 2025) – a significant share of which consists of minor regulatory matters. Thus, decriminalizing such cases will lead to rational reallocation of judicial resources.
4. **Ease of Living:** The Bill introduces several provisions that directly impact the daily lives of citizens:
 - For example, the **Motor Vehicles Act** now includes a 30-day grace period for expired driving licenses, preventing immediate penalties for a minor oversight.
 - Accident victims now have more time (**up to 12 months**) to file for compensation, acknowledging the trauma and medical recovery time families need.
 - It simplifies complex and outdated property tax systems (like in the NDMC area), replacing confusing methods with transparent, modern ones.



Source: PIB

What are some of its challenges?

1. **The “Cost of Doing Business” Problem:** Critics argue that for large corporations, monetary penalties are easily absorbed. If a company budgets for potential fines, the law loses its sting. As one report notes, this could lead to a situation where “illegality becomes a business model”.
2. **Shift of Burden on Administration:** By moving cases out of the courts, the Bill creates a massive need for **Adjudicating Officers (AOs)** within government ministries. Most government departments are already understaffed. Expecting mid-level bureaucrats to act as “judges” for hundreds of thousands of minor violations could lead to a massive backlog within the executive branch.

3. **Lack of Legal Training:** Adjudicating officers are often career bureaucrats, not trained legal professionals. There are concerns that they may not always apply the principles of natural justice as effectively as a trained judge would.
4. **Public Health Concerns:** Critics point to the **Drugs and Cosmetics Act**. By decriminalizing the manufacturing of substandard cosmetics or procedural lapses in drug documentation, some fear that unscrupulous players might prioritize profit over safety, knowing they only face a financial penalty rather than a prison cell.
5. **Inconsistency Across Laws:** The Bill amends 79 different Acts, but the treatment of “similar” offenses is not always uniform. For similar procedural lapses, one Act might impose a heavy civil penalty while another retains a criminal fine. This lack of a **standardized scale** across all central laws can lead to confusion and perceived unfairness.
6. **Adjudication Infrastructure:** For many Acts (such as the Road Transport Corporations Act, 1950), the Bill removes imprisonment but fails to clearly define the new appellate mechanism—meaning a citizen might not know where to go if they want to challenge a penalty.
7. **Suspensions of Retroactive Application:** A particularly damaging political challenge emerged in Goa, where the opposition alleged the state’s version of the bill was backdated to protect those responsible for a nightclub fire that killed 25 people. Such incidents severely erode public trust, turning “Jan Vishwas” (public trust) into “Jan Avishwas” (public distrust).

What could be the Way Forward?

1. **Specialized Training:** AOs must receive legal training to ensure they understand the principles of “Natural Justice” (e.g., the right to be heard) so their decisions aren’t overturned by higher courts later.
2. **Mandate “Faceless” Compliance and Digitisation:** Connect the Bill’s provisions with digital governance tools. Automated, faceless assessments would reduce the discretionary power of individual officers, thereby minimizing opportunities for rent-seeking and making the process more transparent.
3. **Reformative Justice:** Instead of just monetary fines, the government could introduce **Community Service** for minor civic or environmental offenses. This ensures the offender contributes to society rather than just paying their way out of a violation.
4. **Proportionality Check:** Penalties should be linked to the **turnover of a business** or the scale of the impact. A ₹1 lakh fine might ruin a small shop but be irrelevant to a multi-national corporation.
5. **State-Level “Jan Vishwas”:** The Central Government should encourage State Governments to review their own local laws—such as Shops and Establishment Acts—and decriminalize similar minor offenses to ensure a uniform “Ease of Doing Business” across India.

Conclusion:

The Jan Vishwas Bill is an overdue reform. However, its success will depend on whether the institutions tasked with carrying it forward are genuinely equipped, and held accountable, to do so.

UPSC GS-2: Polity

Read More: [The Hindu](#), [PIB](#)

Viksit Bharat Shiksha Adhishthan (VBSA) Bill 2025 - Provisions, Significance & Challenges - Explained Pointwise

The **Viksit Bharat Shiksha Adhishthan Bill, 2025**, which seeks to overhaul the regulation of higher education in India, is under examination of Joint Parliamentary Committee (JPC) for deliberation after its introduction in the Lok Sabha during the winter session. The Bill aims to create a single apex body that replaces UGC, AICTE & NCTE, and aligns the system with NEP 2020. The Bill will apply to HEIs, including Institutions of National Importance (INIs), such as IITs, IIMs, NITs, IISERs, Central & State Universities, as well as Deemed-to-be-Universities. However, the Bill will not apply to medical, legal, pharmaceutical, dental & veterinary institutions.



Source: Students Islamic Organisation of India

What are some of the important provisions of the VBSA Bill?

Establishment of VBSA	- The Bill establishes Viksit Bharat Shiksha Adhishthan (VBSA) as the overarching commission with three vertical councils: Regulatory Council (licensing/entry/oversight), Accreditation Council (quality grading), and Standards Council (academic benchmarks and frameworks). - It repeals UGC Act, AICTE Act and NCTE Act, transferring their powers/assets/liabilities to VBSA; excludes medicine (NMC), law (Bar Council) and architecture (COA). - The VBSA's Regulatory Council grants permission to establish/operate Higher Educational Institutions (HEIs) based on
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	minimum eligibility (land, funds, faculty, infrastructure) via a single-window process. • VBSA can withhold/release grants and recommend funding cuts for non-compliant HEIs; enables performance-linked financing.
Graded Autonomy	It introduces graded autonomy, where institutions with high performance scores are granted full freedom over curriculum, fees, and international collaborations without prior government approval, whereas the poor performers face intervention or closure.
National Academic Credit Bank	The Bill mandates a digital inventory for all student credits that will allow: • Multiple Entry/Exit: Students can leave a degree program after one year (earning a Certificate), two years (Diploma), or three/four years (Degree), with their credits stored in the NACB for up to seven years. • Cross-Disciplinary Transfer: Allowing students to transfer credits between STEM & liberal arts disciplines seamlessly.
Mandatory 'Industry-Academia' Interface	The Bill introduces legal requirement for industry participation: • HEIs are empowered to hire industry experts as full-time faculty without requiring a PhD, provided they have a 15+ years of professional experience. • Every undergraduate degree must include a mandatory 6 month internship or apprenticeship to qualify for the final degree.
Internationalization of Education	To fulfill the "Viksit Bharat" goal, the Bill focuses on global positioning: • Foreign Campus Provision: Streamlined legal framework for top 500 global universities to open campuses in India. • Indian Global Outreach: Provisions for Indian IITs and IIMs to set up "Offshore Centres of Excellence" with simplified repatriated funding rules.
Technology & AI Integration	• National Educational Technology Forum (NETF): A dedicated cell

	within the VBSA to provide AI-driven personalized learning tools to government schools. ● Swayam Plus Expansion: Recognition of high-quality OER (Open Educational Resources) as equivalent to formal classroom credits for up to 40% of any course.
Language & Cultural Integration	● Multilingual Pedagogy: Mandates that all technical and medical textbooks be made available in the 22 scheduled languages of India using AI-translation services. ● IKS Inclusion: A requirement for all HEIs to dedicate at least 5% of their curriculum to “Indian Knowledge Systems” (IKS), covering ancient Indian contributions to science, logic, and ethics.
Funding & Shiksha Kosh	● Viksit Bharat Education Bond: Provision for the government to issue tax-free bonds to private citizens and NRIs to fund school infrastructure. ● Performance-Linked Funding: Moving away from block grants to a model where 30% of government funding is tied to specific outcomes like graduate employability and research citations.

What is the significance of the VBSA Bill?

1. **Employability of Graduates:** For years, the Indian Higher Education System has been criticized for producing unemployable graduates. The VBSA Bill is significant because it legally mandates shift towards competency-based education:
 - a. **Skill-Centricity:** By making internships a degree requirement, it forces the academic system to align with the real-time needs of the global labor market.
 - b. **The Professor of Practice:** This breaks the academic “ivory tower” by allowing industry veterans to teach, ensuring that classroom theory is grounded in current industrial reality.
2. **Reversing ‘Brain Drain’ to ‘Brain Gain’:** The Bill addresses the massive outflow of Indian students & capital to foreign universities:
 - a. **International Hub:** By allowing top global universities to set up their campus in India, it democratizes access to “world-class” education for students who cannot afford to travel abroad.
 - b. **Global Portability:** The National Academic Credit Bank makes Indian credits globally recognizable, facilitating easier exchange and high-level research collaborations.
3. **Structural Economic Transformation:** The Bill acts as an economic instrument rather than just a social one:

- a. **Demographic Dividend:** With India having the world's largest youth population, the Bill provides the legal framework to convert this population into a skilled workforce before the "aging window" begins in the 2040s.
 - b. **Performance-Linked Funding:** By tying government grants to research and employability, it introduces a "competitive federalism" in education, forcing institutions to innovate or face budget cuts.
4. **Rural-Urban Divide:** The VBSA Bill is significant in its attempt to bridge:
- a. **Linguistic Liberation:** By mandating technical education in local languages, it ensures that a student's mastery of English is no longer a barrier to becoming an engineer or a doctor.
 - b. **AI-Democratization:** The use of the NETF (National Educational Technology Forum) aims to provide rural students with the same quality of AI-driven tutoring as their urban counterparts.
5. **Single Higher Education Regulator:** It operationalises NEP's "single regulator" idea by replacing fragmented bodies (UGC, AICTE, NCTE) with VBSA, enabling a "light but tight" framework that cuts red tape while enforcing quality and outcomes.

What are some of the criticisms of the VBSA Bill?

1. **Erosion of Federalism:** Education is a Concurrent list subject, however, the VBSA Bill erodes the State autonomy by:
 - a. **Centralization of Power:** The Bill creates a "super-regulator" (VBSA) that overrides state-level education boards. This centralizes decision-making in Centre, potentially ignoring the unique linguistic and cultural needs of diverse states.
 - b. **State Financial Burden:** The Bill mandates expensive technological upgrades and infrastructure changes, but many state governments argue the Centre has not provided a clear roadmap for funding these requirements at the state university level.
2. **Commercialization of Higher Education:** By allowing foreign universities to repatriate the profit & by encouraging 'Professors of Practice' role from the Corporate world, the VBSA Bill is criticized for promoting privatization of knowledge:
 - a. **Research vs. Profit:** There is concern that research will shift only toward "profitable" science and technology, neglecting the Humanities and Social Sciences, which are essential for a healthy democracy but often yield lower immediate commercial returns.
 - b. **Job Security for Faculty:** The push for contractual and industry-based hiring (Professors of Practice) is seen by some academic unions as an attempt to undermine the permanent tenure system and traditional academic research.
3. **Threats to Academic Freedom:** The Bill introduces rigorous 'National Standards' for curriculum & performance:
 - a. **Ideological Homogenization:** A centralized curriculum could be used to push a specific ideological narrative, limiting the scope for critical thinking and dissent in university spaces.
 - b. **Surveillance through Data:** The mandatory "Academic Bank of Credits" and digital IDs are viewed by privacy advocates as tools for the state to track the intellectual trajectory and political leanings of students throughout their careers.
4. **Digital Divide:** The VBSA Bill leans heavily on AI-driven learning & digital credits:
 - a. **Infrastructure Gaps:** In rural India, where internet penetration is inconsistent and electricity is not always reliable, a heavy reliance on digital education could further marginalize underprivileged students.

- b. **Cost of Implementation:** The move toward “market-linked” education and the entry of foreign universities raise fears of a “two-tier” system: high-quality, expensive private/foreign education for the elite, and underfunded, struggling public institutions for the masses.
- 5. **Practicality of “Apprenticeship Mandate”:**
 - a. While the Bill mandates internships for all degrees, skeptics question the capacity of Indian industry to absorb millions of students every year.
 - b. Most of India’s businesses are micro-enterprises that do not have the administrative capacity to manage structured internship programs, potentially leading to “fake” certificates and a “paper-only” compliance culture.
- 6. **Funding De-linkage:** Removing grant-disbursal powers from VBSA and placing them directly under the Ministry of Education risks **arbitrary, politically influenced funding**, turning public universities into compliance tools rather than autonomous institutions.
- 7. **Inequalities due to Graded Autonomy:** Graded autonomy sounds progressive but could widen inequalities, favouring elite central institutions while marginalising rural/minority-serving ones through performance-linked funding and accreditation pressures.

What can be the Way Forward?

1. **Viksit Bharat Shiksha Viniyaman Parishad (Regulatory Council):** Must focus on a “light but tight” regulatory approach, reducing bureaucratic hurdles for starting and running HEIs.
2. **Viksit Bharat Shiksha Guvatta Parishad (Accreditation Council):** Transitioning from the current NAAC model to a more robust, technology-driven, and peer-reviewed accreditation system.
3. **Viksit Bharat Shiksha Manak Parishad (Standards Council):** Setting global benchmarks for academic curricula that align with Industry 4.0 and multidisciplinary research.
4. **Foreign Universities:** Creating a clear regulatory path for the establishment of foreign university campuses in India.
5. **Credit Transfer:** Formalizing the **Academic Bank of Credits (ABC)** under the VBSA framework to allow global mobility for Indian students.

Read More: [The Hindu](#)
UPSC GS-2: Education

CAPF Bill- Explained Pointwise

The **Central Armed Police Forces (General Administration) Bill, 2026** is a major piece of legislation passed by the Parliament in April 2026. Its primary goal is to create a unified legal framework for the service conditions of “Group A” officers across the different Central Armed Police Forces (CAPFs), such as the BSF, CRPF, CISF, ITBP, and SSB.



Source: MSN

What are some of the important provisions of the CAPF Bill & the changes that it introduce?

- 1. Unified Umbrella Law:** The Act creates a single legal framework to govern **recruitment, promotion, seniority, and service conditions** for Group 'A' General Duty officers across all five CAPFs (CRPF, BSF, CISF, ITBP, SSB). Earlier, CAPFs were governed by separate Acts and rules for each force (e.g., CRPF Act, BSF Act), leading to inconsistencies and litigation.
- 2. IPS Deputation Quotas:** Formally mandates specific quotas for IPS officers on deputation for top leadership positions:
 - **50%** of Inspector General (IG) posts
 - **Minimum 67%** of Additional Director General (ADG) posts
 - **100%** of Special Director General (SDG) and Director General (DG) posts
- 3. Overriding Authority:** Grants the central government powers to frame rules under this Act that will prevail over any other existing law, rule, or order, including previous court judgments.
- 4. Continuity Clause:** Includes a provision to ensure that all existing rules, regulations, and financial benefits remain valid and in force until they are revised or replaced under the new Act, preventing any immediate disruption.



CAPF FORCES EXPLAINED

CRPF, BSF, ITBP, CISF, SSB – Roles & Responsibilities



CRPF – Central Reserve Police Force

- Largest paramilitary force in India
- Main agency for internal security



BSF – Border Security Force

- First line of defense along the Pakistan and Bangladesh borders



ITBP – Indo-Tibetan Border Police

- Deployed along the Indo-China border at high-altitude regions



CISF – Central Industrial Security Force

- Provides security to India's critical industrial and strategic Installations



SSB – Sashastra Seema Bal

- Guards the Indo-Nepal and Indo-Bhutan borders

What was the need for & significance of the CAPF Bill?

1. **Administrative Reform:** By creating a single “umbrella” law to govern recruitment, promotion, seniority, and service conditions for Group ‘A’ General Duty officers across all five CAPFs the Bill aims to replace the previous fragmented system, reduce litigation, and bring consistency. The government sees this as a major reform to strengthen India’s internal security architecture.
2. **Legal Impact:** For years, CAPF cadre officers filed hundreds of lawsuits claiming that IPS “outsiders” were blocking their promotions. The government wanted to end this “litigation trap” by giving the current system a firm legal (statutory) basis that is much harder to challenge than simple government memos.
3. **Strategic Leadership:** The Bill codifies a specific vision: **Internal security is best managed by those with “Pan-India” administrative experience.** By reserving 100% of the Director General (DG) posts for the IPS, the government is signaling that senior leadership requires the political and inter-state coordination skills of the IPS rather than just the tactical combat expertise of the native cadre.
4. **Cooperative Federalism:** The government has defended the law as essential for national security and “cooperative federalism”.

What has been the criticisms or challenges of the CAPF Bill?

1. **Overriding Supreme Court:** The Bill nullifies the 2025 SC verdict in *Sanjay Prakash Vs Union of India* that granted CAPF officers **Organized Group ‘A’ Service (OGAS)** status and explicitly mandated to reduce IPS deputation in senior CAPF ranks over two years. Critics argue it doesn’t cure the legal defects the court identified.
2. **Formalizes a “Glass Ceiling”:** The Bill has been criticized for cementing a permanent “glass ceiling” for CAPF cadre officers, who join the force directly. By reserving the top positions for IPS officers on deputation, it blocks the path for career CAPF officers to ever lead their own organisations. This has led to claims that it will reduce them to “second-class citizens”.
3. **Career Stagnation & the “Ladder System”:** While the Bill guarantees four promotions to address pay parity, it doesn’t necessarily solve the **bottleneck effect**. In a paramilitary hierarchy, promotions move like a ladder. If the top rungs (IG, ADG, DG) are occupied by outside appointees, the entire ladder below them slows down. Thus, while an IPS officer might get three to four promotions in 16 years, a CAPF cadre officer often remains at the same rank for nearly two decades. Critics argue that “financial upgrades” (NFFU) are a poor substitute for the **authority and respect** that comes with a higher rank and title.
4. **Demotivation & Impact on Morale:** The Bill creates a demoralizing “dual system” where officers who spend their careers in challenging field conditions are denied leadership opportunities. Linked to high suicide rates and voluntary retirements in CAPFs.
5. **“Tactical vs. Generalist” Leadership:** The “bitter irony” that CAPF native officers spend decades in high-conflict zones (Maoist jungles, Siachen, etc.), while IPS officers – who are trained primarily for civilian law and order – are brought in at the last minute to command them creates an **Accountability Gap**. Strategic decisions are made by IPS officers on brief tenures (3-5 years) who then return to their home states, while the long-term consequences are borne by the native cadre and jawans.
6. **Harm to National Security:** Imposing a uniform law on forces with distinct operational cultures and sidelining experienced CAPF officers could weaken institutional autonomy and command structures.

What can be the way forward?

1. **The “Reciprocal Deputation” Model:** If IPS officers are allowed to lead CAPFs to gain “field experience,” then CAPF officers should be allowed to serve in organizations traditionally reserved for the IPS, such as the **Intelligence Bureau (IB)**, **CBI**, or even as **Superintendents of Police (SP)** in

specialized state wings. This will create a truly “integrated” national security cadre where expertise is shared, rather than one service dominating the other.

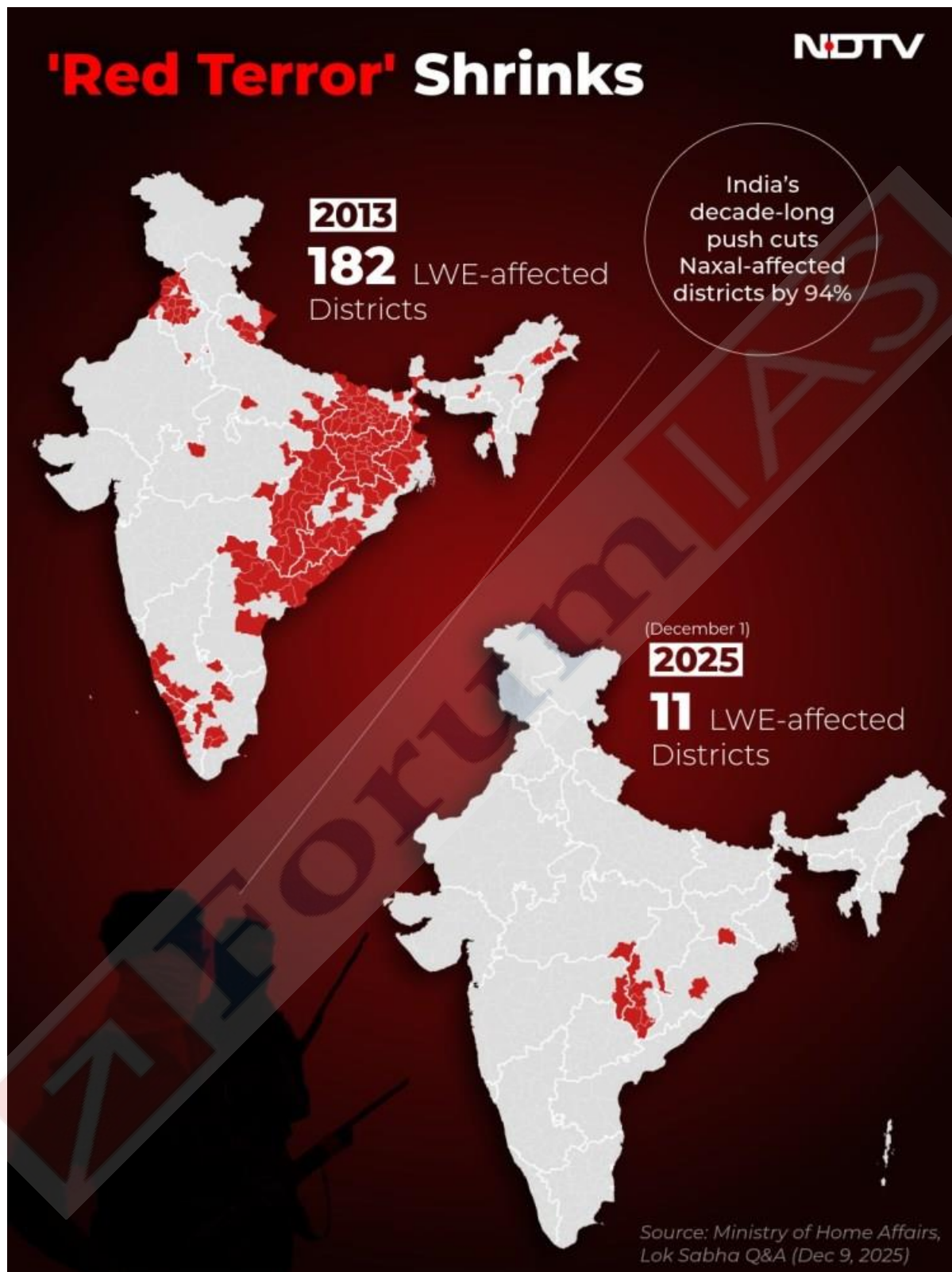
2. **Progressive “Internalization” of Leadership:** Instead of a 100% block at the top, gradually increase the percentage of native cadre officers in the DG and Special DG ranks over the next decade. For example, moving from 0% to 25%, and eventually 50%. This will allow the forces to “grow their own leaders” while still maintaining the IPS link for center-state coordination that the government values.
3. **Fixing the “Promotion Ladder”:** Conduct an urgent, time-bound **Cadre Review** to ensure that a constable or an officer doesn’t spend 20 years in the same rank. In a uniformed service, the “rank on the shoulder” often matters more for morale than the “money in the bank.”
4. **Specialization-Based Postings:** Not all CAPF roles are the same. A CISF officer guarding an airport has a very different job from a BSF officer on the LoC. Thus, reserve the leadership of **Combat-Heavy Forces** (like BSF and ITBP) for native cadre officers who have spent 30 years in those specific terrains, while keeping **Coordination-Heavy Forces** (like CRPF) open to more IPS deputation. This will ensure that those with the most relevant tactical experience are the ones making life-and-death decisions in the field.

UPSC GS-3: Internal Security
Read More: [The Hindu](#)

Naxalism in India – Explained Pointwise

Reflecting the central government’s decisive defence strategy against Left Wing Extremism, significant progress has been made in reducing Naxal-affected regions across the country. With decisive interventions, the Naxal-most-affected districts have been brought down from 36 (2014) to only 3 (2025) and total LWE-affected districts from 126 to just 11 by 2025. The Government has adopted a unified, multi-dimensional and decisive strategy against Naxalism.

Operating on the clear principles of **Dialogue → Security → Coordination**, the Government has set the firm target of making every Naxal-affected area completely **Naxal-free by March 2026**.



Source: NDTV

What is Maoist insurgency in India? Where is it prevalent in India?

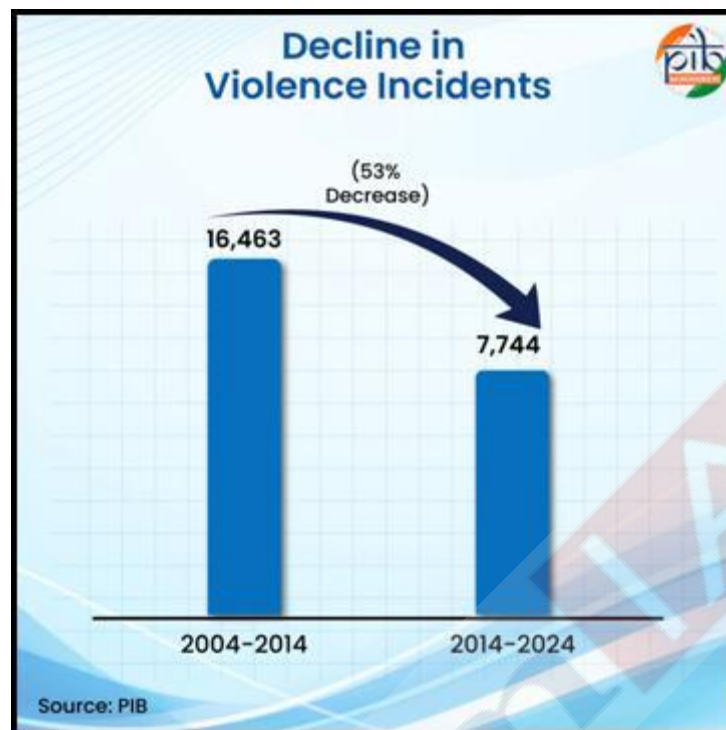
- **Maoist insurgency:** Maoist insurgency, which is also known as Left-wing Extremism (LWE)/Naxalism, is an armed movement rooted in political ideologies that seek to bring about socio-political and economic changes through violent means.
- It is a form of communism developed by **Mao Tse Tung**. It is a doctrine to capture State power through a combination of an armed insurgency, mass mobilization, and strategic alliances.
- Maoists want to bring about a **New Democratic Revolution** in India as part of the world proletarian revolution. They use violence and believe in adopting the military line to capture power.
- These extremists attack the symbols of the country's power such as the police, schools, and other government institutions.

Prevalence of Maoist Insurgency/ Left-Wing Extremism (LWE):

- The Maoist Insurgency/Left Wing Extremism has been a long standing security threat which started in 1967 and gradually spread to different parts of the country. The Maoist insurgency peaked in the early mid-2000s.
- Naxalism in the country was spread across the "**Red Corridor**," impacting states such as Chhattisgarh, Jharkhand, Odisha, Maharashtra, Kerala, West Bengal, Madhya Pradesh, and parts of Andhra Pradesh and Telangana.
- However, with the government's continued push to end the Maoist insurgency through the mix of anti Naxal Operations and welfare measures for the tribals, has started showing results.
- According to the Ministry of Home Affairs (MHA), Naxal-affected districts slashed from **126** (2014) to **only 11** (2025), with most-affected districts down from **36** (2014) to just **3** (2025), marking the near-collapse of the Red Corridor.
- In 2025 alone, 317 Naxals neutralised (including top leadership), 800+ arrested, and nearly 2,000 surrendered, driving the highest-ever attrition and demonstrating irreversible momentum toward a Naxal-free India by March 2026.

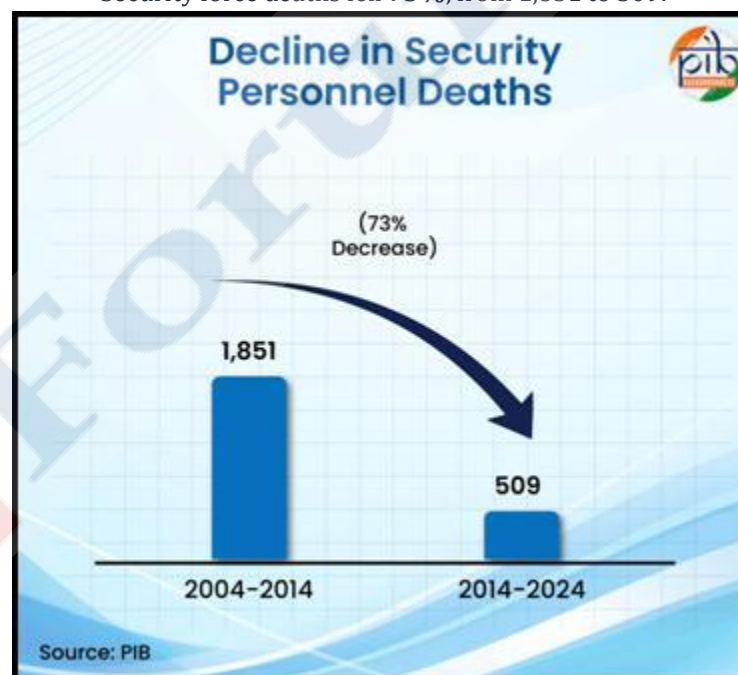
Significant Reduction in Naxal Violence in 10 years:

1. Violent incidents declined **53%** from 16,463 to 7,744:



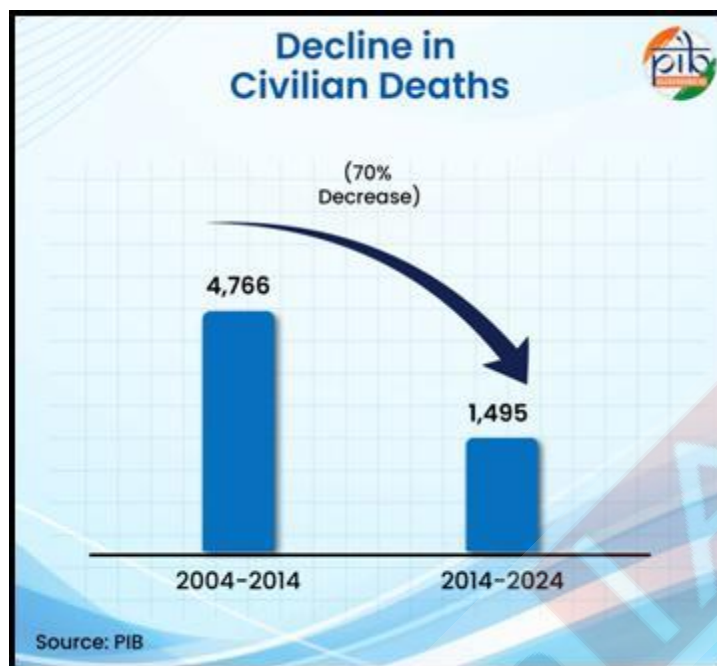
Source: PIB

Security force deaths fell **73%**, from 1,851 to 509:



Source: PIB

Civilian deaths dropped **70%**, from 4,766 to 1,495:



Source: PIB

What are the reasons that led to the growth of Left-Wing Extremism in India?

The **D.Bandopadhyay Committee (2006)** identified **governance gaps** and **extensive discrimination against tribals** in economic, socio-political, and cultural spheres as the primary causes of Naxalism's proliferation. Some of the reasons are enumerated below:

- 1. Inequitable Socio-economic development:** Increasing socio-economic inequities and unemployment in hinterland region nudge the youth to take up arms. There has been **disruption of traditional occupations** and lack of alternative work opportunities.
- 2. Governance failure:** **Governance deficit** in the remote parts of Red Corridor regions led to the growth of Left Wing Extremism. There was development apathy and huge corruption in the red corridor area. **For ex- Lack of food security due to corruption in the PDS scheme.**
- 3. Political Marginalization:** The tribal groups were politically marginalized by the self-serving dominant groups. This led to **political deprivation among the marginalized groups** leading to hopelessness and a sense of powerlessness.
- 4. Land Alienation and Displacement:** There was **failure of land reforms** especially in **land redistribution** after independence. The **development projects** and acquisition of land for industrial purposes have sometimes led to the **displacement of local communities without adequate compensation or rehabilitation**. This has been a focal point of Naxalite agitation.
- 5. Tribal Discontent:**
 - There has been poor implementation of laws prohibiting transfer of tribal land to non-tribals in the Fifth Schedule areas. **Non-regularisation** and **hasty rejections of land grants of traditional land rights under FRA, 2006** have also led to the growth of Left-Wing Extremism.
 - There has been a huge displacement of the tribal population in the Naxalism-affected states due to development projects, mining operations, and other reasons.

- A huge chunk of the tribal population lives below the poverty line. They are also devoid of basic education and health facilities. Thus, Maoists are easily able to persuade them by offering to take up monetary incentives and a better future.

What are the challenges posed by Left-wing extremism (LWE) in India?

- 1. Threat to Internal Security:** Left-wing extremism poses significant internal security threats to India, leading to violent clashes and loss of lives among security forces and civilians. For ex- Maoist rebels engaging in deadly attacks on security forces in remote areas like Dantewada.
- 2. Social and Economic Disruption:** LWE in India disrupts social and economic development in affected regions, hindering infrastructure and welfare projects. For ex- Maoists targeting their roads, schools, and other vital infrastructure to maintain control over their territories.
- 3. Forced Recruitment and Child Soldiers:** Maoist groups have been known to force vulnerable individuals, including children, to join their ranks, exploiting them for their cause. This practice violates human rights and disrupts the lives of countless innocent people.
- 4. Extortion and Illegal Activities:** LWE groups often engage in extortion and other illegal activities to fund their operations. For ex- Demands of 'protection money' from local businesses, leading to economic stagnation in affected areas.
- 5. Undermines Credibility of Government:** The survival of LWE shows a failure of governance thereby eroding the faith of masses in governance set up and impacting the unity of the nation. LWE affected regions struggle with governance issues and weakened trust in democratic institutions. This can undermine the overall stability of the country.
- 6. Human Rights Violations:** LWE groups have been known to commit human rights violations, including extrajudicial killings, abductions, and torture. These actions not only harm innocent civilians but also tarnish India's international reputation.
- 7. Alienation of Tribal Populations:** Maoist insurgents often exploit and alienate tribal population in their stronghold, creating a cycle of violence and mistrust between the communities and the government. This makes it difficult to address the root causes of extremism and to foster long-term peace and stability.

What are the various government policies to control Maoist insurgency in India?

The Indian government has employed various approaches to control Left-wing extremism (LWE), focusing on a combination of security, development, and political initiatives. Some of these approaches include:

Security Schemes & Initiatives for LWE:

National Policy and Action Plan to address Left Wing Extremism 2015	This comprehensive action plan aims to enhance the capabilities of security forces to combat LWE. This action plan ensures that the rights and entitlements of local communities are safeguarded and focuses on socio-economic development in affected regions.
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SAMADHAN Doctrine	SAMADHAN Doctrine encompasses the entire strategy of government from short-term policy to long-term policy formulated at different levels. SAMADHAN stands for: S- Smart Leadership, A- Aggressive Strategy, M- Motivation and Training, A- Actionable Intelligence, D- Dashboard Based KPIs (Key Performance Indicators) and KRAs (Key Result Areas), H- Harnessing Technology, A- Action plan for each Theatre, N- No access to Financing.
Security Related Expenditure Scheme (SRE)	Under the Security Related Expenditure (SRE) Scheme, the Central Government reimburses the Security Related Expenditure of 10 LWE affected States. These security related expenditures are related to training and operational needs of security forces, ex-gratia payment to the family of civilians/security forces killed/injured in LWE violence, rehabilitation of surrendered LWE cadres, community policing, village defence committees and publicity materials.
Special Infrastructure Scheme (SIS)	Under this scheme, funds are being provided to States for strengthening the infrastructure related to Security. Under this scheme 250 fortified Police Stations are being constructed.
Separate Vertical in NIA	The National Investigation Agency (NIA) established a dedicated anti-Naxal vertical that investigated 108 cases and filed charge sheets in 87 cases, significantly weakening the Maoist organisational structure through accelerated prosecution.
Bastariya Battalion	In 2018 the Central Government raised the Bastariya Battalion comprising 1,143 recruits, including an initial 400 local youths from the worst-affected districts of Bijapur, Sukma and Dantewada in Chhattisgarh, turning former Naxal strongholds into sources of trained security personnel fighting the insurgency.
Operation Black Forest	Operation Black Forest, which was launched in Narayanpur (Chhattisgarh), led to neutralisation of 27 dreaded Maoists, including the General Secretary of CPI-Maoist & a topmost leader – who is also the backbone of Naxal movement. This is the first time in 3 decades of Bharat's battle against Naxalism that a General Secretary-ranked leader has been neutralised by the Indian security forces.

Development Schemes for LWE:

Road Connectivity Project for LWE affected areas (RCPLWE)	The Government introduced this scheme in 2016 for improving road connectivity in LWE affected States. The roads included under the scheme have been identified by the Ministry of Home Affairs in consultation with the State Governments and the security agencies. From May 2014 to August 2025, the Central Government has constructed 12,000 km of roads in LWE-affected regions, while projects for a total of 17,589 km have been approved, ensuring all-weather connectivity and mobility in previously inaccessible areas.
LWE Mobile Tower Project	This project has been launched to improve mobile connectivity in the LWE affected areas. The aim is to improve the communication network for better governance delivery. Under the Aspirational Districts and 4G Saturation schemes, 8,527 (4G) towers have been approved – with over 2500 towers now functional – dramatically improving communication and intelligence reach in core Naxal zones.
Aspirational District Programme	The Ministry of Home Affairs has been tasked with the monitoring of Aspirational districts programme in 35 LWE affected districts. Government has implemented various welfare and development schemes to address the root causes of LWE, such as poverty, unemployment, and social inequality in these aspirational districts.

Socio-Political Schemes for LWE:

Panchayat Extension to Scheduled Areas (PESA) Act, 1996	Through this Act government aims to strengthen local governance in LWE-affected areas by promoting democratic participation and empowering local institutions.
Civic Action Programme (CAP)	This Scheme aims to bridge the gaps between Security Forces and local people through personal interaction and bring the human face of Security Forces before the local population. The CAPFs deployed in LWE affected areas are provided funds for conducting civic activities for the welfare of the local people.

Media Plan	Government is implementing this Scheme in LWE affected areas to counter the false propaganda of Maoists. Under this scheme activities like Tribal Youth Exchange programmes are organised by NYKS along with radio jingles, documentaries and pamphlet distribution.
Inter-State Coordination	The government is promoting coordination among states affected by LWE to ensure a unified response. For ex- Regular meeting of Union Home minister with the CMs and DyCMs of all LWE states.
Financial Inclusion	The Central Government has ensured deep financial inclusion in LWE-affected districts by establishing 1,804 bank branches, 1,321 ATMs and 37,850 banking correspondents. It also opened 5,899 post offices across 90 districts with coverage at every 5 km, bringing banking, postal and remittance services directly to remote communities previously under Naxal influence.
Skill Development	The Central Government has launched skill development initiatives in 48 LWE-affected districts by sanctioning 48 Industrial Training Institutes (ITIs) and approving 61 Skill Development Centres (SDCs) . Of these, 46 ITIs & 49 SDCs are already functional, providing vocational training and employment opportunities to local youth, thereby reducing Naxal recruitment and integrating remote communities into the mainstream economy.
Surrender and Rehabilitation Policies	Government has introduced surrender and rehabilitation policies for LWE cadres willing to renounce violence and join mainstream society . These policies offer financial incentives, vocational training, and support for reintegration into society.

Other initiatives:

1. A **dedicated left-wing extremism division** was established in 2006 under the Ministry of Home Affairs. It aimed to **effectively address the LWE insurgency** in a holistic manner.
2. **CPI (Maoist) Party is designated as a terrorist organization** under the Unlawful Activities (Prevention) Act, 1967. This gives the forces greater power and autonomy to deal with Maoists.
3. Over **12,000 km** roads, **586 fortified police stations**, **361 new camps**, **8,500+ mobile towers** operational, and **₹92 crore assets** seized have ended geographical and financial dominance of Maoists in core areas.
4. **Naxal's Financial Choking:** The Central Government has effectively choked Naxal financing by forming a dedicated vertical in the NIA that seized assets worth over ₹40 crore, while states seized more than ₹40 crore and the Enforcement Directorate attached ₹12 crore. Simultaneous action has

inflicted severe moral and psychological damage on urban Naxals and tightened control over their information warfare networks.

Areas Freed from Naxals after 3 decades (Success Stories):

- Security forces, through decisive operations such as **Octopus**, **Double Bull** and **Chakbandha**, have liberated long-held Naxal bastions including Budha Pahad, Parasnath, Baramasia and Chakrabandha (Bihar) after three decades of Maoist control, established permanent camps deep inside remote jungles, and reached the hitherto impenetrable Abujhmad (Chhattisgarh) region.
- These sustained offensives forced the PLGA battalion to abandon its core area in Bijapur-Sukma and caused the complete failure of the Naxalites' 2024 Tactical Counter Offensive Campaign (TCOC), marking the collapse of their strategic stronghold and operational dominance.

What had been the issues associated with government measures to control LWE?

1. **Human Rights Violations:** Security operations against Maoist insurgency have sometimes led to **human rights violations**, including **extrajudicial killings**, **arbitrary arrests**, and **harassment of civilians**. These actions can alienate local communities and create resentment against the government.
2. **Inadequate Implementation of Development Schemes:** Despite numerous welfare and development programs, their implementation in LWE-affected areas is often hampered by **corruption**, **bureaucratic inefficiencies**, and a **lack of coordination between various agencies**. As a result, the intended benefits may not reach the affected communities.
3. **Insufficient Capacity Building of Security Forces:** The security forces sometimes lack specialized training, equipment, and intelligence support to effectively tackle Maoist insurgency. This sometimes leads to **operational failures** and **increased casualties** among security personnel.
4. **Reliance on Force:** Excessive focus on security operations overshadows the need for political engagement and dialogue with LWE groups. A **purely militaristic approach could prolong the conflict** and hinder efforts to find a peaceful resolution.
5. **Incomplete Rehabilitation Programs:** While surrender and rehabilitation policies exist, they are not effectively implemented. There are certain cases of **inadequate support for reintegration** such as insufficient vocational training or financial assistance.
6. **Lack of Trust and Cooperation:** Mistrust between the government and affected communities **hinders the implementation of development initiatives** and security operations. Building trust is crucial for fostering cooperation and addressing the root causes of LWE.
7. **Political Instability and Opportunism:** Political instability and opportunism undermines efforts to address LWE. Politicians often **exploit the issue for electoral gains**. This further complicates the government's response to the problem.

Read More- [Tackling the Maoists: On left-wing extremism](#)

What should be done to completely eliminate the Left Wing Extremism in India?

1. **Focus on Development:** The **successful implementation of development projects** in **Andhra Pradesh** and **Telangana** reduced Maoist insurgency. Thus we must focus more on the effective implementation of development projects.

2. **Strengthen Local Governance:** Empowering local governments to address grievances and deliver public services effectively, as seen in the **Panchayati Raj system's success in reducing Naxalism in West Bengal**, can help build trust between communities and authorities.
3. **Enhance Security Forces' Capabilities:** Provide specialized training and better equipment to security personnel, similar to the **Greyhounds Force in Andhra Pradesh**, which proved effective in countering Maoist insurgency due to their specialized training and local knowledge.
4. **Encourage Dialogue and Peaceful Resolution:** Engage in meaningful dialogue with Maoist groups to address their grievances, similar to the **peace talks between the Indian government and Naga insurgents**, which led to a ceasefire and reduced violence in the region.
5. **Foster Community Engagement:** Involve local communities in decision-making processes and development projects, as seen in the success of the **Janmabhoomi Program in Andhra Pradesh**, where community participation helped build trust and reduce Maoist influence.
6. **Ensure Accountability and Transparency:** Strengthen measures to prevent corruption and human rights abuses, as demonstrated by the **National Human Rights Commission's interventions** in cases of alleged human rights violations by security forces, which can help restore public trust in government institutions.

Conclusion: Over the past eleven years, the Central Government's coordinated, multi-pronged strategy—combining calibrated security operations, unprecedented infrastructure push, financial choking, rapid development saturation and an attractive surrender policy has shrunk Left-Wing Extremism from 126 districts in 2014 to just 11 in 2025, with only three remaining “most-affected”. While pockets of resistance remain and complete eradication demands sustained vigilance till the declared deadline of **31 March 2026**, the trajectory is unmistakable: the ideological and territorial backbone of the Naxal insurgency has been broken, paving the way for lasting peace and development in regions long deprived of both.

Read More: [PIB](#)

UPSC Syllabus- GS 3: Security Issues – Linkages between development and spread of extremism.

Heatwaves in India- Explained Pointwise

Heatwaves in India are becoming more severe and frequent, posing serious health risks. The last 2 years recorded unprecedented temperatures, with over 57% of Indian districts now classified as heat-prone. IMD predicts a rise in maximum temperatures and more heatwaves in eastern and southern India in the coming days. India must stay prepared to handle these recurring heatwaves.

What are heatwaves? How are they defined in India?

- **Heatwaves:** Heat waves are **prolonged periods of excessively hot weather** that can cause **adverse impacts** on **human health, the environment**, and **the economy**.
- **Definition of Heatwave:** In India IMD defines heatwave based on the following criteria:

Physiography of regions	Plain: Maximum temperature recorded at a station is 40 degrees Celsius or more . Coast: Maximum temperature recorded at a station is 37 degrees Celsius or more . Hills: Maximum temperature recorded at a station is 30 degrees Celsius or more .
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Departure from Normal Temperature	Heat Wave: Departure from normal is 4.5°C to 6.4°C Severe Heat Wave: Departure from normal is $>6.4^{\circ}\text{C}$
Actual Maximum Temperature	Heat Wave: When actual maximum temperature $\geq 45^{\circ}\text{C}$ Severe Heat Wave: When actual maximum temperature $\geq 47^{\circ}\text{C}$

*Heat Wave is declared if above criteria are met in at least 2 stations in a Meteorological subdivision for at least two consecutive days.

What is the status of Heatwaves in India?

India has been affected by the Heatwaves since a long time. However, during the last few decades, due to increased instances of climate change, the impact of heat waves has also enhanced quite significantly.

- States like **Rajasthan, Gujarat, Uttar Pradesh, Delhi, Haryana, Punjab, Madhya Pradesh** have been affected the most by the Heatwaves.
- According to IMD, **between 1981 and 1990** there were **413 heatwave days** in India. However, the heatwave days have increased to **600 days** between **2011 and 2020**.
- The number of deaths from heat-related causes increased from **5,457** between **1981 and 1990** to **11,555** between **2011 and 2020**.

What are the factors behind the increase in Heatwaves in India?

Heatwaves can be caused by a combination of natural and human-induced factors. The main causes are mentioned below:

NATURAL CAUSES	1. High Atmospheric Pressure Systems: Heatwaves occur when high-pressure systems stall over a region. These systems trap warm air near the Earth's surface and prevent the normal movement of air masses, leading to prolonged periods of hot weather. 2. Climate Variability: Natural climate variations, such as El Nino and La Nina events, influence weather patterns and increase the likelihood of heatwaves. For ex- During El Nino events, warmer ocean waters in the tropical Pacific lead to changes in atmospheric circulation and weather patterns. 3. Drought and Dry Conditions: Prolonged periods of drought and lack of precipitation reduces the overall moisture of the soil, causing the land to heat up more quickly during heat waves. 4. Changes in Wind Patterns: Shifts in wind pattern transports hot air from one region to another which intensifies heat waves in areas that are not typically prone to such extreme temperatures. 5. Geography and Topography: Geographic features and topographical conditions also contribute to the development of heat waves. For ex-
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	Landlocked valleys and regions surrounded by mountains trap hot air and lead to temperature spikes.
ANTHROPOGENIC CAUSES	1. Global Warming: The long-term increase in Earth's average temperature, primarily driven by human activities such as burning fossil fuels, deforestation, and industrial processes, contributes to the frequency and intensity of heat waves. 2. Urban Heat Island Effect: Urban areas with high population density, extensive concrete and asphalt surfaces, and limited vegetation tend to absorb and retain more heat, has created localized zones of higher temperatures. This phenomenon, known as the urban heat island effect, has intensified heat waves in cities. 3. Rapid Land Use & Land Cover (LULC) Changes: Deforestation: The loss of green cover reduces evapotranspiration—the process by which plants release moisture into the air to cool the environment. Without trees, the sun's energy goes directly into heating the ground. Wetland Encroachment: Many Indian cities have built over traditional water bodies and wetlands. These areas previously acted as "heat sinks," absorbing heat and providing a cooling effect through evaporation. 4. Air Conditioning: The widespread use of ACs in urban areas creates a feedback loop. AC units exhaust hot air into the streets, raising the ambient outdoor temperature for those without cooling. 5. Vehicular & Industrial Emissions: Heat generated by internal combustion engines and industrial processes adds "sensible heat" directly to the lower atmosphere. 6. Greenhouse Layer: A thick haze of pollutants (aerosols) can act like a blanket, trapping outgoing infrared radiation and preventing it from escaping into space at night.

What are the impacts of Heatwaves?

- 1. Impact on Human Health:** Rapid rises in heat compromises the body's ability to regulate temperature resulting in a cascade of illnesses, including heat cramps, heat exhaustion, heatstroke, and hyperthermia. When external temperature approaches 37°C, the human body struggles to release internal heat, resulting in heat stress affecting organs like kidneys, liver, and brain. Reducing hospital and emergency room burden improves health system efficiency.
- 2. Impact on Energy:** Heatwaves increase the electricity demand for cooling purposes, leading to strain on power grids and potential blackouts.
- 3. Impact on the economy:** Heatwaves disrupt economic activities, affecting productivity of workers and labourers, lacking the access to reliable electricity for cooling during heatwaves. According to an ILO study at 34°C, workers can lose up to 50% of their work capacity. Protecting outdoor workers ensures continuity in farming, construction, logistics, and industrial sectors. It reduces loss of working hours, safeguards GDP.

4. **Social Equity and Justice:** The impacts of heatwaves are disproportionately felt by the poor, women, elderly, and migrant workers, making heatwave mitigation a key element in addressing social inequities. For the affluent, heat is an inconvenience managed through private cooling; but for nearly 400million informal workers, it is a systemic violation of the right to life & a driver of 'Thermal Justice'. For these individuals, even a small rise in temperature causes a significant drop in productivity & a corresponding loss of income.
5. **Impact on Water Resources:** Heatwaves exacerbate water scarcity issues in India due to drying up of water bodies and decrease in the groundwater table. This exacerbates the inter-state conflict over water. For ex- Cauvery water Dispute.
6. **Climate Resilience and SDG Goals:** Heatwaves are one of the most direct manifestations of climate change. Addressing them contributes to the global goal of mitigating climate change and reducing carbon emissions. Aligns with SDG 3 (Health), SDG 8 (Decent Work), SDG 11 (Sustainable Cities), and SDG 13 (Climate Action).
7. **Impact on food security:** The rise in heat waves increase the probability of droughts, enhance demand of irrigation water, which impacts agricultural production and increases food insecurity.

What are the challenges in addressing heatwaves?

1. **Early and Unpredictable Onset of Heatwaves:** Heatwaves are now starting earlier in the year, catching authorities and populations off-guard. In 2025, severe heatwaves struck North and Central India 20 days earlier than in 2024, before HAP protocols were activated.
2. **High Vulnerability of the Informal Workforce:** Nearly 75% of India's workforce (~400 million), especially in agriculture, construction, and street vending, is directly exposed to outdoor heat. In Odisha and Gujarat, many daily wage workers continued working in peak heat hours due to lack of income alternatives or workplace protections.
3. **10% Trap:** Since heatwaves are not currently on the Nationally Notified Disaster List, States are restricted by the '10% Trap', where they can only utilize a small fraction of their State Disaster Response Fund for relief efforts.
4. **Economic and Productivity Losses:** As per ILO and World Bank estimates (2023) heatwaves have a tangible economic cost, including loss of 3–5% of GDP and up to 6% of annual work hours. In sectors like agriculture and construction, heat-induced fatigue reduced work output and delayed infrastructure projects in Rajasthan and Telangana.
5. **Unequal and Disproportionate Impacts:** Marginalized groups—women, elderly, migrants, and the urban poor—face higher exposure with fewer coping mechanisms. Migrant families living in tin-roofed shelters in Delhi reported extreme indoor heat and health issues during April 2024.
6. **Partial and Uneven Implementation of Heat Action Plans (HAPs):** While 140+ cities and 23 states have HAPs, many lack funding, inter-agency coordination, and local customization. A 2023 CEEW analysis found that only a handful of HAPs included cooling centres, outreach in local languages, or inter-departmental response mechanisms.
7. **Insufficient Public Awareness and Risk Communication:** Awareness about heatwave risks and protective behavior remains low, especially in rural and low-income urban areas. In Bihar, despite IMD warnings in 2024, many communities continued outdoor weddings and festivals in peak hours, leading to heat-related illnesses.

Read More- [Protecting the most Vulnerable due to Increasing heatwaves in India](#)

What steps have been taken by the government to address the issue of heatwaves?

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Heat Action Plans	The Indian government has updated Heat Action Plans across 23 states , aiming to strategically combat and manage heatwaves.
Public Health Preparedness	The Union Health Ministry reviews the preparedness for managing Heat-Related Illnesses (HRIs) periodically indicating a proactive approach to address the health impacts of heatwaves.
Focus on Vulnerable Groups	The government initiatives prioritize protecting high-risk groups like children, pregnant women, the elderly , and people with chronic diseases .
Awareness Campaigns	About 100 districts have initiated campaigns to raise awareness about heatwave risks and precautions.

What should be the Way Forward?

- Heatwaves as National Disaster:** Accept 16th Finance Commission's recommendation to include heatwave & lightening in the Notified National Disaster List for the 2026-31 period. Such a move would unlock the National Disaster Response Fund, bypass current spending restrictions, and convert early warnings from simple advisories into binding mandates for district admin.
- Heat Index:** Ministry of Labour & IMD must transit towards Heat Index – a metric combining temperature & humidity to reflect true human feel – as the primary legal trigger for declaring heatwaves. This is essential to ensure that coastal areas, which face the lethal combination of heat & humidity, are not at a disadvantage in national safety protocols.
- Effective implementation of Heat Wave Action Plan:** Effective implementation of the Heat wave action plan with the **State playing a leading role and sharing responsibility with other stakeholders** is now the need of the hour. Update HAPs in every State based on local vulnerability assessments. Include humidity, nighttime temperatures, and thermal comfort indexes for long term planning.
- Improve Early Warning and Forecast Systems:** Introduce Heat Health Alert (HHA) systems as in the UK. Use predictive analytics for work timing adjustments in schools, factories, and offices.
- Build Heat-Resilient Infrastructure:** Promote cool roofs, white rooftops, reflective paint, better urban ventilation, and green corridors. Adopt heat-resilient building codes and zoning laws.
- Sustainable Cooling:** Passive cooling technology like **construction of ventilated buildings** and the **use of porotherm bricks**, can be a vital alternative to address the urban heat island for residential and commercial buildings.
- Heatwave Mitigation Plans:** Heatwave mitigation plans which includes **access to drinking water, oral rehydration solutions (ORS), shade at public places, flexible working hours in workplaces** must be effectively designed and implemented.
- Protect Informal Workers:**
 - Allow staggered/shifted work hours.
 - Provide financial support and insurance for wage losses during heatwaves.

- Govt must exercise its powers under Sec 23 of OSHWC Code (Occupational Safety, Health & Working Conditions) to notify binding heat safety rules – such as provision of specialized PPE (Personal Protective Equipment) as a non-negotiable employer obligation.
- 9. **Creation of more Green Spaces:** According to the UN, investment of US\$ 100 million in street trees globally can bring 1°C temperature reduction. India must scale up its reforestation and tree plantation efforts. **For ex- Haritha Haram project of Telangana Govt** to increase the green cover in Telangana from the current 24% to 33%.
- 10. **Adoption of energy efficient solution:** The masses should be encouraged to adopt more energy efficient solutions like **using desert coolers in place of air conditioners in dry areas**.
- 11. **Data-Driven Decision Making:** Collect granular, real-time heat morbidity and mortality data. Map hotspots within cities to identify intra-urban heat inequality.
- 12. **Encourage Behavioral and Institutional Change:** Public awareness campaigns, climate literacy, and workplace heat safety protocols.
- 13. **Long-Term National Policy:** Integrate heatwave resilience in National Disaster Management Plan, Smart Cities Mission, and urban master plans. Incentivize tree plantation, wetland conservation, and urban greening.

Conclusion: The battle against heatwaves must move beyond token advisories and aim for science-based, people-centric, and equity-focused long-term planning. As the cost-effectiveness of heat adaptation is well-established, prioritizing this agenda is not only a climate responsibility but also a development necessity. Hence, heat governance must be reimagined as a core component of the social contract where thermal safety is a non-negotiable mandate of constitutional justice.

Read More: [The Hindu](#)

UPSC Syllabus:

GS Paper 3: Environment – climate change

GS Paper 1: Geography – Important Geophysical phenomena such as Heatwaves.

Implications of Increasing Lok Sabha Size – Explained Pointwise

The government has circulated a set of 3 Bills related to delimitation & women's reservation in the Lok Sabha. These Bills, if passed, could significantly affect the working of the Parliament in future. So, it is important to understand the changes that will be introduced by these Bills & what would be their implications.

Which are the three Bills introduced by the government in the Lok Sabha?

1. **The Constitution (One Hundred and Thirty-First Amendment) Bill, 2026:** This Bill proposes a massive expansion of the Lok Sabha.
2. **The Delimitation Bill, 2026:** This Bill provides the framework for redrawing constituency boundaries based on population changes, ending a decades-long freeze on seat allocation.
3. **The Union Territories Laws (Amendment) Bill, 2026:** To amend laws governing Union Territories, including Delhi and Jammu & Kashmir, to align with the new seat allocation and reservation provisions.

What are the changes proposed in these Bills?

1. **Expansion of the Lok Sabha:** It proposes to increase the maximum strength of the Lok Sabha from 543 to **850 members**. This would consist of 815 seats for States and 35 seats for Union Territories.

2. **Establishment of a Commission:** It creates a powerful **Delimitation Commission** chaired by a retired Supreme Court judge to decide exactly where the new 850 seats will be placed.
3. **New Basis for Delimitation:** The Bill lifts the decades-old freeze on seat readjustment (which was based on the 1971 Census). It allows for a fresh delimitation exercise based on the **"latest published census figures,"** which Parliament will notify (in this case, the 2011 Census).
4. **Implementation of Women's Reservation:** It provides the constitutional mechanism to operationalise the 2023 women's reservation law (*Nari Shakti Vandan Adhiniyam*), enabling 33% of seats in the Lok Sabha and State assemblies to be reserved for women, likely from the 2029 general elections.
5. **Increased Strength for J&K Assembly:** The Bill proposes that the total strength of the J&K Legislative Assembly cannot fall below **114 seats**, which includes the 24 seats reserved for PoK (which are currently vacant).

What is the significance of the proposed changes?

1. **Outdated Representation:**
 - Since 1971, the allocation of Lok Sabha seats to states has been frozen based on the population census of that year. This was a temporary measure to encourage population control, but the freeze has been extended repeatedly.
 - As a result, while India's population has grown from 55 crore to over 140 crore, the number of seats has remained virtually unchanged. Some MPs now represent **3 million voters**, while others represent only **0.5 million**. This creates a "democratic deficit" where a citizen's vote in a high-population state (like Bihar) has less "weight" than a vote in a lower-population state.
 - The 850-seat expansion is meant to equalize this ratio – equalizing the value of vote of every citizen regardless of their State of residence.
2. **Fast-tracking Women's Reservation:** It decouples the implementation of the **Nari Shakti Vandan Adhiniyam** (33% women's quota) from the next official Census, allowing it to be implemented sooner (by the **2029 elections**) through immediate delimitation (using 2011 Census data rather than waiting for a future Census data). Under the original timeline, women might not have seen these seats until 2034.
3. **Ending the "Constitutional Freeze":**
 - In 1976, during the Emergency, the government froze seat redistribution to ensure that states implementing family planning (mostly in the South) weren't "punished" by losing political power.
 - This was supposed to be a **temporary measure**, but it was extended in 2001 for another 25 years. The freeze expires in 2026. For a healthy democracy, we cannot ignore 50 years of demographic shifts, urbanization, and migration.
 - The new Bills move India from a **"frozen"** system to a **"flexible"** one where Parliament can determine when to adjust seats.
4. **Protect Southern States' Share:** The Bills propose to lift the freeze and conduct a fresh delimitation based on the **2011 Census**. To prevent southern states from losing political power in Parliament due to their successful population control policies, the government has proposed increasing the total strength of the Lok Sabha from 543 to **850 seats**, increasing every State's representation proportionally by 50%.
5. **Integration of Jammu & Kashmir (The PoJK Clause):** The Delimitation Bill includes a provision to allow the Election Commission to conduct delimitation in Pakistan-Occupied Jammu & Kashmir (PoJK)

whenever the area ceases to be under Pakistani occupation. This is a strong political and legal statement, reinforcing the Indian government's position that the entire region of the former princely state of Jammu & Kashmir is an integral part of India.

What are the challenges or concerns raised against the proposed changes?

- 1. North-South Imbalance:** Delimitation based on population (2011 Census) will change the relative of share of seats in the Lok Sabha for each State – effectively reducing Southern States' share of seats in Lok Sabha in comparison with the Northern States (biggest losers will be Kerala & Tamil Nadu and main gainers are Rajasthan, Bihar & UP). It will lead to MPs from UP & Bihar having significant power to shape national policy vis-a-vis the Southern states who have successfully lowered their population growth rates through better health and education policies.
- 2. Constitutional Freeze on Delimitation:** These Bills will provide Parliament with the flexibility to determine the periodicity of delimitation and the Census to be used for this purpose. However, since the government of the day typically commands a majority in the Lok Sabha, the decision would effectively rest with the government. Although approval from the Rajya Sabha would still be required, its role may be weakened by these very Bills.
- 3. Weakened Rajya Sabha:**
 - While the size of Lok Sabha is being increased by these Bills, there is no proposal to change the size of the Rajya Sabha. This affects the **relative importance** of the two Houses.
 - During **Joint Sittings**, each member of Parliament has one vote, the Lok Sabha with 815 seats will have 3.3 times the strength of the Rajya Sabha (at present, Lok Sabha with 543 seats has 2.2 times the votes of the Rajya Sabha with 245 seats).
 - This imbalance will not help the government of the day to get its Bills pass through a Joint Session, but will also play out in the elections to the **offices of the President** and the **Vice-President**.
- 4. Size of Council of Minister:** The Constitution was amended in 2003 to limit the Council's size to 15% of the Lok Sabha. If the Lok Sabha is expanded to have 815 MPs, the limit on the size of the Central Council of Minister will also increase from **81 to 122**.
- 5. Quality of Parliamentary Work:** The increased size of the Lok Sabha reduces the opportunity for an MP to participate in the deliberations of the House. MPs hold the Ministers accountable by asking questions, passing motions & resolutions, and raise important issues in Parliament in the Zero Hour. However, Questions & Zero Hour interventions are chosen by lottery, and an increased size of the Lok Sabha reduces the probability of getting balloted.
- 6. Global Precedents:**
 - Other countries also have large legislatures, for e.g., the U.K. House of Commons has 250 members. However, it has also evolved processes to provide opportunities to MPs to participate in discussion. It averages over 150 sittings a year & also has a robust committee system – Parliament committees can supplement deliberations. Every Bill in UK Parliament has to be examined by the Committees of both the Houses.
 - In comparison, the Indian Parliament, **sits for less than 70 days in a year**, and **less than a fifth of the Bills** are referred to the Committees.
- 7. Impact on State Legislatures:** Though these Bills do not have similar provisions regarding the size of State legislatures, that decision will be taken by the Delimitation Commission. If they decide to follow the same rationale & increase the size by 50%, legislatures of some of the States will become oversized, for e.g. UP would have **600 seats**, while the legislatures of WB & Maharashtra would reach about **450 seats**.

What should be the Way Forward?

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1. **The “Cap and Compensate” Formula:** Instead of distributing seats purely by raw population count, the government could include a “Performance Weightage” in the Delimitation Bill. States would get “bonus” weightage for high rankings in the **Human Development Index (HDI)**, **Total Fertility Rate (TFR) control**, and **economic contribution**. This ensures that states like Kerala or Tamil Nadu aren’t politically marginalized for their social progress.
2. **All-Party Meeting and Wider Consultations:** Given that constitutional amendments require a two-thirds majority and ratification by half of the State Legislatures, send the Bills to a **Joint Parliamentary Committee** or convene an all-party meeting and conduct wider consultations with civil society, stakeholders, and all state governments before any decision is finalized. This will help build consensus, especially among regional parties that currently view the Bill as a threat.

Conclusion: These Bills will have a significant impact on the composition the Parliament & its functioning, thus, it is imperative that such Bills go through intensive deliberations, both inside & outside of the Parliament.

UPSC GS-2: Polity

Read More: [The Hindu](#)

Nutritional Security in India – Significance and Challenges – Explained Pointwise

Nutrition is closely linked to the development of human capital in the country, as improved nutrition contributes to better health, learning outcomes and productivity. As **POSHAN Abhiyaan** completes eight years, the mission reflects the growing emphasis on convergence, technology-enabled governance and community participation in addressing nutrition challenges. The transition to **Mission Poshan 2.0** underscores a continued focus on improving service quality, expanding early childhood care and strengthening last-mile delivery systems.



Source- The Hindu

What is Nutritional Security? What is the Status of Nutrition insecurity in India?

- **Nutritional Security:** According to the FAO (2009), nutrition security implies physical, economic and social access to balanced diet, clean drinking water, safe environment, and health care (preventive and curative) for every individual.
- **High Nutritional Insecurity in India (Malnutrition):** According to World Bank Report, despite the sharp decline in extreme poverty in India from 45.9% to 13.4% between 1993 and 2015, India still suffers from a high malnutrition burden.
- **Extreme Poverty according to WB:** Defined at \$1.9 per capita per day at the 2011 purchasing power parity rate (PPP).

Latest Findings of NHFS-5 regarding malnutrition:

- a. More than half the Indian women in the 15-49 age group are anemic.
- b. The prevalence of stunting (Low height-for-age) amongst children under five years is 35.5%.
- c. The prevalence of wasting (Low weight-for-height) amongst Children under five years is 19.3%.
- d. The proportion of underweight children in India is 32.1%.

Double Burden of Nutritional Insecurity: According to a new Lancet study, there has been a steady increase in obesity levels in India. India has become one of the countries with a high 'double burden of nutritional insecurity', with the increase in both **malnutrition** and the **obesity levels**.

Read More- [Obesity in India- Explained Pointwise](#)

Key Findings of the Household Consumption Expenditure Survey (HCES) Report Regarding Nutrition Security in India:

- a. **Nutritional Insecurity amongst the 10% Poorest Population:** Average daily per capita calorie Intake (PCCI) for a healthy life is 2,172 kcal in rural India and 2,135 kcal in urban India. The calorie intake of the poorest 10% of the Indian population is below the average PCCI. The average daily PCCI of 10% poorest population is 1,564-1,764 kcal in rural areas and 1,607-1,773 kcal in urban areas.
- b. **Nutritional insecurity Variation amongst the 10% Poorest Population:** There is variation in calorie intake amongst the 10% poorest population. The average PCCI for the poorest 5% in rural areas is 1,564 kcal, and for the next poorest 5% is 1,764 kcal. In urban areas, the figures are 1,607 kcal and 1,773 kcal, respectively.
- c. **Proportion of Poor/Deprived based on Nutritional Requirement:** The proportion of poor based on the nutritional threshold of PCCI is estimated at 17.1% for rural areas and 14% for urban areas.

What are the reasons for the lack of Nutritional Security in India?

There are multiple reasons behind the lack of nutritional security in India. These are explained below:

1. **Affordability Issues for the Poor Household:** Affordability of nutritious food products, such as **green leafy vegetables, protein-rich diet**, has become difficult for the poor households in India. The increasing wealth inequality, with top 10% of Indians holding 57% of the national income, has exacerbated nutritional insecurity.
2. **Focus on Staple Crops:** Agricultural policies, like **Green Revolution**, have **prioritized the production of staple crops like wheat and rice** over **diverse, nutrient-rich crops**. This has led to micronutrient deficiencies amongst the population.
3. **Calories Fundamentalism:** The focus of the Public Distribution Scheme has been **limited to ensuring food security and calorie requirement**. The need for nutritional development has not been taken into account.
4. **Feminine marginalization in Nutrition:** The nutritional requirements of adolescent and young female in poor and lower middle income households are not prioritized. This leads to malnourished female population and their off-springs. **For ex- Large prevalence of anemia due to inadequate focus on iron deficiency in female diet.**
5. **Laxity in effective implementation of Child Care practices:** Child caring practices, including exclusive breastfeeding, and introduction of complementary food and a diversified diet after the first six months, are not implemented properly. **For ex- Only 55% of children in India were exclusively breastfed in 2015-16.**
6. **Growth of Fast-food and junk-food Culture:** Cheaper and easily available junk food has replaced the nutritious food in the dietary intakes of Indian population. **For ex- According to recent Household Consumption Survey, Indians are spending less on cereals and pulses and more on beverages, refreshments and processed food.**
7. **Increased income and urbanization:** Increased income levels have led to a rise in the consumption of foods high in **fats, sugar**, and **low physical activity**. According to a joint study conducted by WHO and ICRIER, India's ultra-processed food industry has grown at a **CAGR of 13.37%** in terms of retail sales value between 2011 and 2021.

What are the negative effects of malnutrition?

1. **Child Deaths:** According to a Lancet Study in 2019, a **staggering 68% of 1.04 million deaths of children under five years in India** were attributable to malnutrition.
2. **Improper development of Children in formative years:** Obesity in children results in **stunted physical and cognitive development**.
3. **Psychosocial Impact:** Malnourished individuals face psychosocial challenges like, **body image issues and mental health concerns** due to societal stigmas associated with weight.
4. **Economic Burden:** Malnutrition increases the economic burden due to **productivity losses** on account of **decreased work efficiency and absenteeism**.
5. **Social Inequality and Disparities:** Undernutrition and malnutrition perpetuates a cycle of health challenges and economic disadvantages amongst the **vulnerable sections**, exacerbates existing socio-economic disparities. **Women are disproportionately affected by malnutrition**, facing challenges related to reproductive health, maternal health, and overall well-being.

What Initiatives have been undertaken to provide for Nutritional Security in India?

National Nutrition Strategy (2017)	NITI Aayog's National Nutrition Strategy emphasised convergence, improved monitoring and community participation, and recommended a mission-mode approach. It aims to reduce the prevalence of underweight children (0-3 years) by 3% every year by 2022 from NHFS 2015-16 estimates. Building on this, the POSHAN Abhiyaan was launched in 2018 as India's National Nutrition Mission to bring multiple ministries and schemes under a unified framework with time-bound targets, digital monitoring and a Jan Andolan approach.
National Nutrition Mission (NNM) [POSHAN Abhiyan]	National Nutrition Mission (NNM), also known as POSHAN Abhiyan (Prime Minister's Overarching Scheme for Holistic Nourishment) is a flagship, multi-ministerial mission to place nutrition at the centre of India's national development agenda. POSHAN Abhiyaan recognizes that malnutrition cannot be addressed by the health or food sector alone — it requires simultaneous action on sanitation, education, water, women's empowerment, and income. POSHAN Abhiyaan was designed around a lifecycle and preventive approach — rather than solely addressing acute malnutrition after it occurs. The mission places special emphasis on the first 1,000 days — from conception to two years of age — as this period is critical for physical growth, brain development and long-term health outcomes. The defining character of POSHAN Abhiyaan is its positioning of nutrition improvement as a Jan Andolan — a genuine people's movement rather than a government-administered programme.

Mission POSHAN 2.0	The Union Budget 2021–22 consolidated India’s fragmented nutrition initiatives under Mission Poshan 2.0 (Mission Saksham Anganwadi and Poshan 2.0), creating a unified and integrated framework. This restructuring subsumed the following schemes: 1. Anganwadi Services 2. Scheme for Adolescent Girls 3. POSHAN Abhiyaan The mission is re-structured & operates through the following primary verticals: 1. Nutrition Support for children, pregnant women & lactating mothers & adolescent girls. 2. Early Childhood Care and Education (3-6 years) and early stimulation for (0-3 years) 3. Anganwadi Infrastructure including upgradation of centres into Saksham Anganwadi
Poshan Tracker App	Poshan Tracker serves as the primary governance tool for monitoring infrastructure and service delivery. The application has facilitated near real-time data collection for Anganwadi Services, daily attendance of children, ECCE activities, and growth monitoring. Poshan Tracker Application now enables near real-time monitoring of over 14 lakh Anganwadi Centres & nearly 9 crore beneficiaries under the National Nutrition Mission.
Poshan Pakhwada	Observed annually since 2018, Poshan Pakhwada is a two-week intensive outreach campaign conducted in April to strengthen community mobilisation and reinforce key nutrition behaviours under POSHAN Abhiyaan.
Rashtriya Poshan Maah	To promote nutrition awareness, Poshan Maah is celebrated every September as a nationwide Jan Andolan. The campaign is implemented across all States and Union Territories through Gram Panchayats, Urban Local Bodies, schools, health facilities and Anganwadi Centres in convergence with partner ministries.
National Breastfeeding Promotion Programs	Programs like MAA- Mother’s Absolute Affection and Vatsalya- Matri Amrit Kosh, aim to strengthen the regulation on breast milk substitutes and improve breastfeeding practice.

Integrated Child Development Services (ICDS)	The ICDS, launched in 1975, provided the foundational platform for supplementary nutrition, health services and early childhood care through Anganwadi Centres. Integrated Child Development Services provides nutritional meals, preschool education, primary healthcare, immunization, health check-up and referral services to children under 6 years of age and their mothers.
Pradhan Mantri Matru Vandana Yojana (PMMVY)	Recognising that the health of a mother is a critical factor in ensuring the health and nutrition of her child, PMMVY was launched in 2017. This scheme introduced maternity benefits through direct cash transfers, thus providing financial support for pregnant and lactating mothers.
Midday Meal Scheme	It aims to provide cooked meals to every child within the age group of six to fourteen years studying in classes I to VIII who enrolls and attends the school.

What Should be the Way Forward?

- 1. Change in the Policy Focus:** The agricultural policies and programmes should be leveraged to be more '**nutrition sensitive**'. The focus of food distribution programmes need to **shift** from '**calories fundamentalism**' to **providing a more diversified food basket**, including coarse grains, millets, and pulses to improve the nutritional status of pre-school children and women of reproductive age.
- 2. Innovative approaches:** Innovative techniques such as **bio-fortification**, which involves incorporating nutrients into the seeds of major food grains will help to improve the micro-nutrient intake. Various food-based safety nets such as **PDS, MDM** can include **bio-fortified staples** to provide a more diversified food basket.
- 3. Enhanced Focus on WASH initiatives:** **Synergy** between **WASH initiatives** (safe drinking water, sanitation and hygiene) and **nutritional interventions** will have a multiplier effect on nutritional outcomes. This will help in improving child nutritional outcomes and are key to the success of nutritional interventions.
- 4. Focus on Women education:** Targeted programs for improving the educational status of girls, particularly at the higher educational levels, need to be promoted. This will help in **better implementation of child care practices** like breastfeeding and nutritional needs of children.
- 5. Improving healthcare services:** Improvement of access and utilization of **prenatal and post-natal healthcare services must be prioritized**. It would play a significant role in curbing under-nutrition amongst children through comprehensive awareness programs and community participation.
- 6. Successful International Interventions:** India can draw key lessons from some of the developing countries to tackle the challenge of food insecurity and malnutrition. **For ex- Brazil** has transformed its food system and is investing in agricultural R&D and **social protection programs** to reduce the level of hunger in the country. **China** has attached great importance to **early childhood development** and has formulated a series of plans in this regard.

Conclusion: As India advances towards the vision of a Viksit Bharat by 2047, continued investments in nutrition, early childhood development and service delivery systems will remain critical for building a healthy, productive and resilient population.

Read More: [PIB](#)

UPSC Syllabus- GS Paper 2- Social Issues, Issues related to hunger and poverty

Industrial Disasters – Causes & Way Forward – Explained Pointwise

India has experienced numerous **industrial disasters** over the decades, ranging from chemical leaks and mining accidents to factory fires and structural collapses. Recently, a blast occurred in Vedanta's thermal power plant in Chhattisgarh that killed 21 people. Last year also, a lethal accident happened in the pharma unit of Sigachi Industries in Hyderabad that led to the death of 36 workers there, similarly, 8 workers were killed in Tamil Nadu at a firework manufacturing unit in Virudhunagar district.

The frequency of such accidents raises the question of safety at industrial places in India & is likely to have a negative bearing on the manufacturing sector & trade from it for India. Thus, it is important to understand what steps the government has taken & should take to ensure that such disasters do not occur in future.

Some important INDUSTRIAL DISASTERS in India:

Bhopal Gas Tragedy (1984)	● Cause: Leak of methyl isocyanate (MIC) gas from Union Carbide plant. ● Impact: Over 15,000 deaths, 5 lakh+ affected ● It was the world's worst industrial disaster & led to Environmental Protection Act (1986)
Jaipur IOC Depot Fire (2009)	● Cause: Leak of petrol vapour at IOC oil terminal. ● Raised questions on oil depot safety near urban areas.
NTPC's Feroz Gandhi Thermal Power Plant (2017)	● Cause: Pressure build-up in boiler due to excessive ash accumulation which led to tube failure.
Vizag Gas Leak (2020)	● Cause: Styrene gas leak at LG Polymers chemical plant.
Neyveli Lignite Plant Explosion (2020)	● Cause: Boiler explosion

Vedanta's Thermal Power Plant (2026)	● Cause: Failure of Primary Air fan that led to a dangerous pressure build-up inside the boiler.
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What are the CAUSES of industrial disasters in India?

1. Inadequate Inspections: Factory inspectorates and pollution control boards are often understaffed, underfunded, and lack the technical expertise to conduct thorough and frequent inspections of industrial units, especially those handling hazardous chemicals. This leads to lax enforcement of existing safety and environmental regulations.

2. Inadequate Training and Awareness: Many workers, especially contractual laborers, lack proper training in handling hazardous materials, operating machinery safely, and emergency response procedures. This often stems from industries trying to cut costs.

3. Lack of Safety Culture: A poor safety culture within an organization, where safety is not prioritized by management and employees alike, is a significant underlying cause. This can manifest as a disregard for safety protocols, shortcuts in operations, and a failure to report near misses.

4. Equipment Failure and Maintenance Issues: Neglecting regular maintenance, inspection, and repair of machinery, pressure vessels (*for e.g. negligence in equipment upkeep caused sudden fluctuations in boiler's pressure in Vedanta thermal power plant*), pipelines, and safety systems is a major cause. Worn-out components are prone to malfunction. Some older plants may use outdated technology and machinery that is inherently less safe or less efficient compared to modern alternatives.

5. Inadequate Risk Assessments: Failure to conduct thorough Hazard Identification and Risk Assessment (HIRA) studies, Process Hazard Analysis (PHA), and Safety Audits to identify all potential risks and implement appropriate control measures.

6. Poor Siting: Locating hazardous industries too close to densely populated residential areas (*for e.g. as seen in the Bhopal Gas Tragedy and Vizag gas leak*) significantly increases the risk to human life in case of an accident.

7. Informal Sector Challenges: A significant portion of India's industrial activity is in the unorganized or informal sector, which often operates outside regulatory oversight, making workers highly vulnerable to unsafe conditions.

What are the CONSEQUENCES of industrial disasters?

Human Consequences	● Loss of Life: The most tragic and immediate consequence is the loss of lives of workers, residents in surrounding communities, and emergency responders. ● Severe Injuries and Disabilities: Many survivors suffer from severe injuries (burns, respiratory damage etc.) that can lead to permanent disabilities, chronic illnesses, and a significant reduction in their quality of life.
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Environmental Consequences	● Air Pollution: Disasters involving gas leaks (e.g., Methyl Isocyanate in Bhopal, Styrene in Visakhapatnam) release highly toxic substances into the atmosphere, which can travel long distances, contaminating a wide area. ● Water Contamination: Spills, leaks, and discharge of chemical effluents into rivers, lakes, and other water bodies contaminate aquatic ecosystems, harming marine life and making water unsafe for human consumption, agriculture, and livestock. ● Soil Contamination: Chemical spills and deposition of hazardous substances from the air can contaminate agricultural land, making it infertile or rendering crops unsafe for consumption. This has long-term implications for local livelihoods and food security. ● Biodiversity Loss and Ecosystem Damage: Direct exposure to toxic substances can kill flora and fauna, disrupt food chains, and damage entire ecosystems. This can lead to a loss of biodiversity and ecological imbalance in affected regions.
Economic Consequences	● Loss of Livelihoods: The affected industrial unit might be shut down permanently or temporarily, leading to significant job losses for workers. ● Economic Disruption: Disasters can disrupt local economies, impact supply chains, and affect investor confidence, particularly if the affected industry is a major employer or contributor to the regional economy. ● Impact on agricultural economy: Contamination of land and water can destroy crops and make farming unsustainable, leading to loss of income for farmers.
Social Consequences	● Forced displacement of people: People living in highly affected or uninhabitable areas may be forced to abandon their homes and migrate, leading to social disruption, loss of community ties, and increased pressure on recipient areas. ● Inter-Generational Effects: Emerging research, again highlighted by studies on Bhopal survivors, indicates that industrial disasters can have multi-generational health impacts, with children born to exposed parents facing higher risks of disabilities and cancers later in life.

What INITIATIVES have been taken by the government to prevent such disasters?

1. Factories Act, 1948: This is the primary legislation regulating working conditions in factories, including provisions related to safety, health, and welfare of workers. It places responsibilities on factory owners to ensure a safe workplace. Post-Bhopal (1987 amendment), its scope was significantly extended to cover risks from hazardous industries, mandating safety committees, safety officers, and addressing dangerous operations.

2. Environment (Protection) Act, 1986:

- Enacted in the wake of the Bhopal disaster, this umbrella act gives the central government wide powers to protect and improve environmental quality.
- **Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989:** Notified under the EP Act, these rules detail the responsibilities of occupiers of industrial premises handling hazardous chemicals, including requirements for safety reports, on-site emergency plans, and public information.
- **Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996:** These rules mandate the preparation of off-site emergency plans by district authorities for managing chemical accidents, and establish Crisis Groups at central, state, and district levels.

3. Public Liability Insurance Act, 1991: This Act mandates industries handling hazardous substances to take out insurance policies. This insurance provides immediate interim relief to persons affected by accidents occurring while handling such substances, even without proving fault.

4. Occupational Safety, Health and Working Conditions Code, 2020: This is a recent consolidated code that aims to simplify and rationalize existing labor laws related to occupational safety, health, and working conditions. It extends provisions to more establishments and emphasizes employer duties, safety committees, and regular audits.

5. Guidelines on Chemical Industrial Disaster Management (2007): These comprehensive guidelines provide a framework for all stakeholders (industry, government agencies, local authorities) for prevention, preparedness, response, and mitigation of chemical industrial disasters. Key elements include:

- Risk mapping of Major Accident Hazard (MAH) units.
- Development of on-site and off-site emergency plans.
- Regular mock drills and exercises.
- Establishment of Emergency Response Centres (ERCs) and integration with other emergency services.
- Emphasis on HAZOP (Hazard and Operability Study) and HAZAN (Hazard Analysis) for early hazard identification.

What DISASTER MANAGEMENT MEASURES should be taken to prevent such industrial disasters?

1. Strengthening Regulatory and Enforcement Mechanisms:

- Continuously review and update existing acts (Factories Act, EP Act, PLI Act) and rules (MSIHC, Chemical Accidents Rules) to incorporate latest scientific advancements, international best practices (e.g., EU's Seveso Directive), and lessons learned from past disasters.
- Significantly increase the number of factory inspectors, safety officers, and environmental auditors. Ensure they are adequately trained, equipped with modern tools, and well-remunerated to attract and retain talent.
- Impose significantly higher penalties for non-compliance, including severe fines, imprisonment, and immediate closure of non-compliant units. Expedite legal proceedings against violators to ensure deterrence.

2. Fostering a Culture of Safety and Responsibility:

- Safety must be a core business value, not just a compliance requirement. Senior management must visibly commit to and invest in safety.

- Create a non-punitive environment where workers feel safe and encouraged to report near-misses, unsafe conditions, and procedural deviations without fear of reprisal.
- Conduct frequent and realistic mock drills for both on-site and off-site scenarios, involving all stakeholders, to test the effectiveness of emergency plans and identify gaps. Learnings from drills must be incorporated.

3. Advanced Risk Assessment Tools: Utilize Artificial Intelligence (AI) and Machine Learning (ML) for predictive analytics to identify potential failure points in equipment and processes based on operational data, enabling proactive maintenance.

4. Strategic Industrial Zoning: Implement and strictly enforce policies for locating new hazardous industries away from densely populated residential areas, schools, and hospitals. Re-evaluate and, where feasible, relocate existing hazardous units that are currently located in highly populated areas.

5. Adequate Resources: Ensure that emergency services (fire departments, hospitals) in industrial zones are adequately equipped and trained to handle industrial accidents, including chemical hazards.

CONCLUSION:

Industrial disasters are a threat to not only the economy of a rapidly industrializing country like India but also to its society. Stronger enforcement, modernized infrastructure, better training, and a culture of safety—especially in the informal sector—are urgently needed to prevent tragedies in the future. The Bhopal Gas Tragedy led to a rethinking on industrial safety, this blast in Telangana should do the same by fixing accountability & strengthening the regulatory framework in our country.

Read More: [Indian Express](#), [Wikipedia](#)
UPSC GS-3: Disaster Management

Female Labour Force Participation – Explained Pointwise



India's Low Female Labour Force Participation rate is a big threat to India's Demographic Dividend. India still has not cracked the code of getting women to work in time. Any further delay in improving the female labour force participation in productive sector, will be detrimental to India's dream of becoming a developed nation by 2047.



Female Labour Force Participation Rate

- » Female Labour Force Participation Rate is a ratio of the number of women who are part of the labour force to the number of women in the working age (greater than 15 years of age). A woman is considered to be a part of the labour force if she/he is either employed or actively looking for work.
- » Female Labour Force Participation Rate (FLFPR) is consistently increasing in India over the years. It has increased from **24.5% in 2018-19** to **37% in 2022-23**.
- » However, according to the World Bank, Indian women's participation in the formal economy is among the lowest in the world. India needs to improve its low FLFPR to reap its rich demographic Dividend

↓ Reasons for low FLFPR

- » The High Degree of Informalisation discourages women from participating in the labour force. **95% of India's working women are informal workers (ILO).**
- » **Missing Manufacturing sector jobs** and limited number of jobs in services for women.
- » Gender Pay Gap and Glass ceiling. India has one of the **largest gender gap in median earnings** of full-time employees (ES 18)
- » **Pinkification of Jobs** limit the role of women to specific job profiles like nursing, teaching, gynaecologist.
- » **Unpaid care, child care and domestic chores**, has hindered women's ability to participate in the labour force
- » **Educated Unemployment phenomenon**- Unavailability of jobs that match the high female education levels
- » **Safety Concerns** like violence against women and sexual harassment at workplace

For detailed Reading- 7 PM Link



Advantages of FLFPR

- » Economic Boost- Gender parity in the workforce can **improve India's GDP by 27% (IMF).**
- » Tackle the phenomenon of **feminisation of poverty** which is a result of informalised women workforce
- » Improvement in Social Indicators like the **MMR and IMR**
- » Enables women to play a greater role in decision-making like **family planning**
- » Fulfilment of Global Commitments like **SDG-1, SDG-5, SDG-8**

Created By ForumIAS

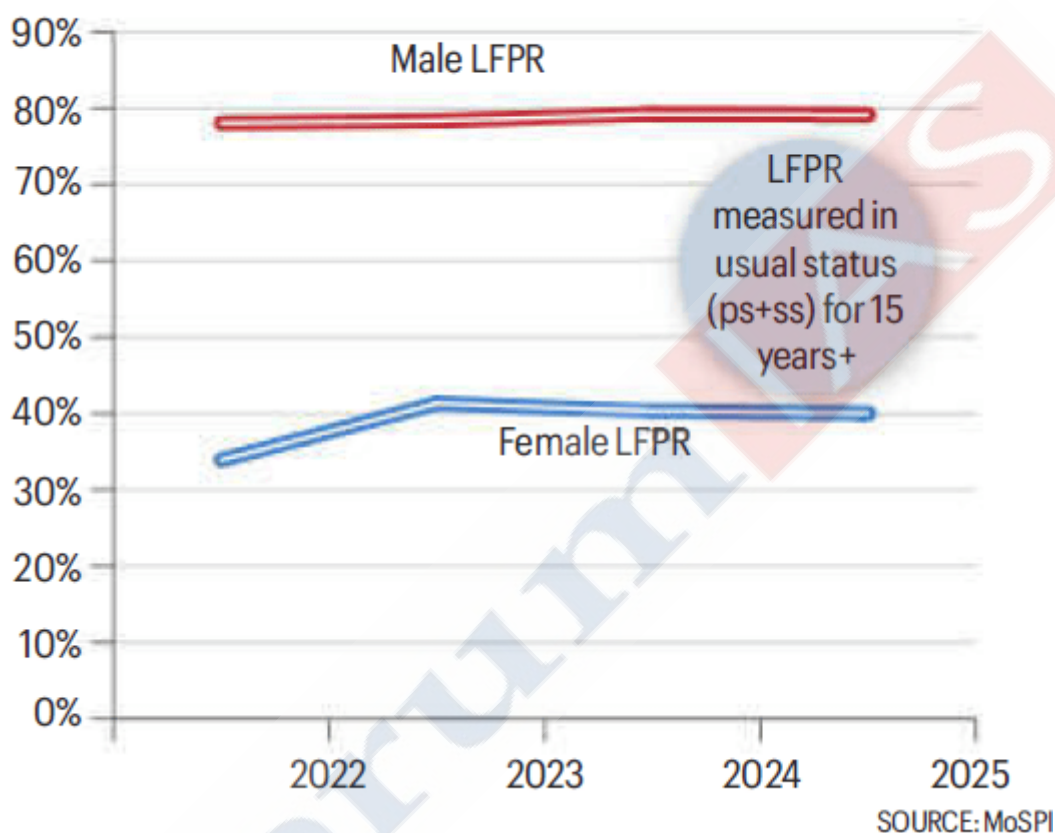
What is Female Labour Force Participation Rate (FLFPR)?

- Female Labour Force Participation Rate is a ratio of the number of women who are part of the labour force to the number of women in the working age (greater than 15 years of age).
- A woman is considered to be a part of the labour force if she is either employed or actively looking for work.

FLFPR trend in India:

1. Female Labour Force Participation Rate (FLFPR) is consistently increasing in India. The FLFPR has risen from 33.9% in 2022 to **40%** in 2025. However, it is still remains well below the **global average (49%)** & emerging market peers like **Brazil (53%)** & **Vietnam (69%)**.

● Female LFPR has risen to half that of men...

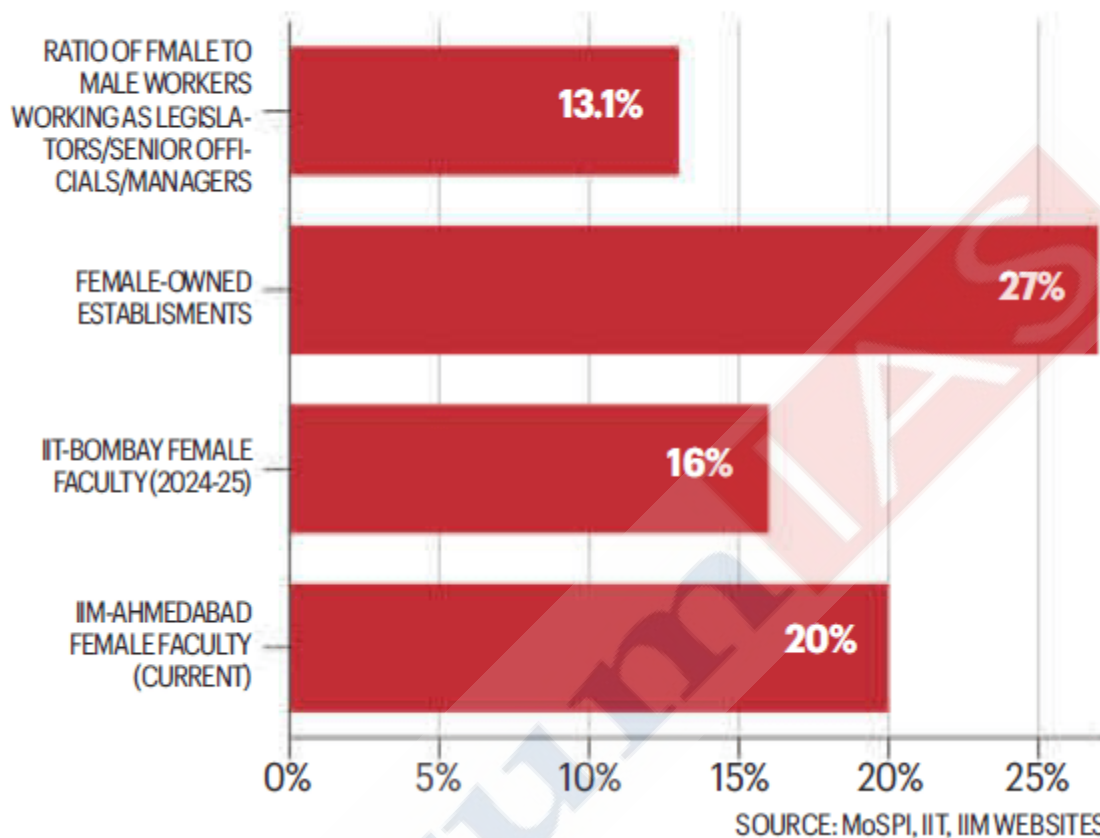


Source: MoSPI

2. Glass Ceiling:

- While the FLFPR is rising, their presence in senior positions in various spheres is much lower.
- Female representation is low in business decision making as well. According to MoSPI's Annual Survey of Unincorporated Sector Enterprises, the share of female-owned proprietary establishments stood at 27% in 2025.
- According to PLFS, for every 100 males working as legislators, senior officials, and managers in 2025, there are only 13 females in similar high positions.
- While nearly all of India's leading firms have a woman as a director on their boards, 77% had only 1-2 women as directors.
- Only 7% of BSE200 & 5% of NSE500 board chairpersons are women. Without achieving a critical mass (30% according to research), their presence at top risks being symbolic rather than substantive in India's corporate governance landscape.

● But in positions of power, women lag behind



Source: Indian Express

3. The simple average of the FLFPR of the five southern Indian states (Tamil Nadu, Karnataka, Telangana, Andhra Pradesh, Kerala) is 13% lower than the five northern states of Himachal Pradesh, Rajasthan, Chhattisgarh, Madhya Pradesh and Jharkhand. This defies the conventional belief that southern states, with high literacy and women empowerment indices, will have high FLFPR.
4. There are only four states (Assam, Bihar, Haryana and Delhi) with an FLFPR of less than 25%. Delhi has the lowest at 14.8%.
5. According to the World Bank, Indian women's participation in the formal economy is among the lowest in the world. Only some parts of the Arab world perform worse than India in terms of FLFPR.

What are the reasons for low Female Labour Force Participation rate in India?

1. **High Degree of Informalisation:** According to a 2018 study by the International Labour Organisation (ILO), more than 95% of India's working women are informal workers. The absence of social security net in the informal sector discourages women from participating in the labour force.
2. **Missing manufacturing:** Lack of alternative employment opportunities in manufacturing and the limited number of jobs in services for women, has also suppressed FLFPR in India.
3. **Gender Pay Gap and Glass ceiling:** According to the Economic Survey 2018, India has one of the largest gender gap in median earnings of full-time employees. Such discriminatory practices at workplace adversely affects FLFPR.

4. **Pink Jobs:** The societal notions about ‘gendered occupations’ limit the role of women to specific job profiles like nursing, teaching, gynaecologist etc. There are tangible and intangible barriers to entry of women in multiple professions like heavy engineering, law enforcement, armed forces etc.
5. **Cultural practices:** Unpaid care, child care and domestic chores, has hindered women’s ability to participate in the labour force. In a patriarchal society, many women are not allowed to work after marriage.
6. **Time Poverty:** Indian women spend an average of **363 minutes per day** on unpaid domestic work, compared to just **123 minutes** for men. This “time poverty” is the single largest barrier to formal employment.
7. **Increase in Household Income:** The rise in household incomes in both the rural and urban areas has provided women the choice to not take up jobs.
8. **Safety Concerns:** High incidents of violence against women at workplace as well as in public places discourages women to work in the night like their male counterparts. Further, instances of sexual harassment at workplace induces women to opt out of labour force.
9. **Educated Unemployment:** Women are going for higher education, as seen in Gross Enrolment Ratio (GER) of secondary education. The lack of availability of jobs that match the high female education levels also contributes to the low FLFPR.
10. **Legally sanctioned restrictions:** Many States continue to **restrict women’s participation in hazardous jobs in factories and commercial establishments** for e.g. women are not allowed to work on stone-cutting machines, shop floor of boilers, etc.
11. **Political Vacuum:** The current Lok Sabha has only 14.4% women, despite women constituting around 50% of Indian population. The lack of gender perspectives inhibits formulation of a comprehensive policy that encourages women participation in economic activities.

What is the significance of enhancing Female Labour Force Participation?

1. **Economic Boost:** According to the IMF, gender parity in the workforce can **improve India’s GDP by 27%.**
2. **Poverty Reduction:** Women’s earnings improve household income diversification, reduce poverty, breaking intergenerational poverty cycles. It helps to tackle the phenomenon of feminisation of poverty, which is a result of highly informalised work performed by women.
3. **Improvement in Social Indicators:** Encouraging more women to enter the formal workforce will improve indicators like Infant Mortality Rate (IMR), Maternal Mortality Rate (MMR).
4. **Self Confidence and Dignity:** Financial independence enables women to play a greater role in decision-making like family planning.
5. **Demographic Dividend Utilisation:** With a young population, India needs all hands to capitalize on its demographic dividend. Excluding women undermines productivity gains and risks a demographic burden instead. With India’s population growth slowing, women’s participation is vital to sustaining the labor supply required for the “Make in India” and services-led growth models.
6. **The “Multiplier Effect”:** Studies consistently show that women invest a larger portion of their income (up to 90%) into their children’s education, nutrition, and healthcare compared to men.
7. **Social Norms Shift:** Rising FLFP challenges patriarchal norms, normalizes working women, and encourages policy changes like better childcare, safe transport, and workplace flexibility, creating a virtuous cycle.

8. Fiscal & Demographic Balance: It expands the tax base, reduces dependency ratios, and supports social security systems. It also addresses labor shortages in sectors like manufacturing and care economy.

9. Global Commitments: Improving FLFPR is related to achievements of **SDG 1** (No Poverty), **SDG 5** (Gender Equality), **SDG 8** (Decent Work and Economic Growth) and **SDG 10** (Reduced inequalities).

What steps have been taken by the Government to enhance Female Labour Force Participation?

Mission Shakti	Mission Shakti is the flagship initiative designed to support women throughout their life cycle. It is divided into two sub-schemes: 1. Sambal (Safety & Security): Includes One Stop Centres (OSC) for legal and medical aid, the 181 Women Helpline, and Nari Adalats (women's collectives) to facilitate gender justice. 2. Samarthya (Empowerment): Focuses on economic independence: a. SakhiNiwas: Working Women Hostels that provide safe and affordable accommodation. b. Palna: A national crèche scheme that provides childcare facilities in or near workplaces (including Anganwadis) to reduce the “double burden” on working mothers.
Skill Development	PM Kaushal Vikas Yojana (PMKVY): Nearly 45% of the candidates trained under this national skill development program are women. 30% reservation for women in all Industrial Training Institutes (ITIs). NAVYA initiative is a pilot program to equip adolescent girls with vocational training in non-traditional job roles. Swavalambini program aims to cultivate an entrepreneurial mindset among female students in higher education. Women Entrepreneurship Platform (WEP): A NITI Aayog initiative that acts as a one-stop portal for women to access mentorship, funding, and networking.

Economic & Entrepreneurship Incentives	Lakhpati Didi Scheme: Aimed at empowering 3 crore (30 million) rural women to earn an annual income of at least ₹1 Lakh through micro-enterprises and skill training. Drone Didi: A specialized initiative to train 15,000 SHG women as drone pilots for agricultural purposes (pesticide spraying, crop monitoring), integrating women into high-tech rural jobs. Mudra Yojana & Stand-Up India: These schemes provide collateral-free loans. Notably, over 68% of Mudra loan beneficiaries are women, helping them start or scale small businesses. Stand up India: The scheme facilitates bank loans for setting up a new enterprise in manufacturing, services, agri-allied activities, or the trading sector by SC/ST/Women entrepreneurs. It provides bank loans between INR 10 lakh and up to 1 crore.
Safety & Dignity at Work	Sexual Harassment of Women at Workplace Act, 2013: The Act was enacted to protect women from sexual harassment at their place of work. SHe-Box Portal: 'SHe-Box' portal provides a centralized online system to file complaints related to workplace sexual harassment.
New Labour Codes	Code on Wages (2019): Equal pay for equal work; no gender discrimination in recruitment or wages. Code on Occupational Safety, Health and Working Conditions (OSH) 2020: Women are now legally permitted to work night shifts and in all sectors (including underground mining and heavy machinery), provided their consent is given and the employer ensures safety and transportation. Maternity Benefits: The Maternity Benefit Act (amended) provides 26 weeks of paid leave and mandates crèche facilities for establishments with 50+ employees. It proposed an option to work from home after this period, on mutual agreement with the employer.
Anganwadi centres under the ICDS	They provide maternal and child nutritional security, a clean and safe environment, and early childhood education. Thus, they facilitate the ability of women to re-enter work post-childbirth.

National Food Security Act (NFSA), 2013	Apart from providing affordable food, it entitles pregnant and lactating mothers to a cash transfer of at least INR 6,000. This is done to break the compulsion for early returning to work.
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What should be the Way Forward?

1. **Strengthening the “Care Economy”:** The single largest barrier to female participation remains “time poverty” due to the disproportionate burden of unpaid domestic work. The care economy can be addressed by following:
 - a. **Child Care Subsidies:** Child-care subsidies should be provided to free up mothers’ time to enter the labour force, which would have significant implications in increasing female employment.
 - b. **Universal Childcare:** Scaling the Palna scheme beyond Anganwadis into urban industrial clusters and IT hubs.
 - c. **Elder-Care Infrastructure:** As India’s demographic shifts, elder care is becoming a new domestic burden. Developing a regulated professional caregiving industry can simultaneously reduce women’s domestic load and create new jobs.
 - d. **Normalizing Paternity Leave:** Moving toward “Gender Neutral Parental Leave” to shift the societal expectation that caregiving is solely a female responsibility.
2. **Comprehensive approach to improve women labour force participation:** A comprehensive approach aimed at improving skill development, access to child care, maternity protection, and provision of safe and accessible transport, is needed.
3. **Removal of the legally sanctioned legislation:** States should review legislations like the Factory Act, Shops and Establishment Act etc. and liberalise the restrictions on women. The best practices from well performing States can be adopted across all States for e.g. Andhra Pradesh and Telangana are the only two states that allow women to work in all processes in all establishments.
4. **Creation of Self Help Groups:** The focus should be on creation of more Self Help Groups. They are of immense reliance and drastically enhance women participation as seen in case of Kudumbashree model of Kerala.
5. **Use of innovative solutions to enhance female retention in industries:** Public crèches can be operated at worksite clusters such as near industrial areas, markets, dense low-income residential areas, and labour nakas. This model has been tested successfully by Self-Employed Women’s Association (SEWA) Sangini in some Indian cities.
6. **Formalizing the Gig Economy:** Leveraging the e-Shram portal (which now has over 54% female registration) to provide social security and health benefits to women in the gig and platform economy (e.g., beauty services, digital tutoring).
7. **Safety Infrastructure:** Implement women-centric policing and improve lighting in public spaces to reduce dependency on costly private transport (the ‘Pink Tax’).
8. **Returnships:** Create “returnship” programmes specifically for women re-entering the workforce after a career break due to caregiving.

Conclusion: There is a need to take multiple steps to augment the female labour force participation in India in order to realise the numerous social and economic benefits that accrue from greater presence of women in the workforce. It can help India move from women-centric development to women-led development.

Read More: [Indian Express](#)

UPSC Syllabus- GS 3 Inclusive Growth, GS 1 Women empowerment, GS 2 Vulnerable sections of the society

India-South Korea Relationship – Explained Pointwise

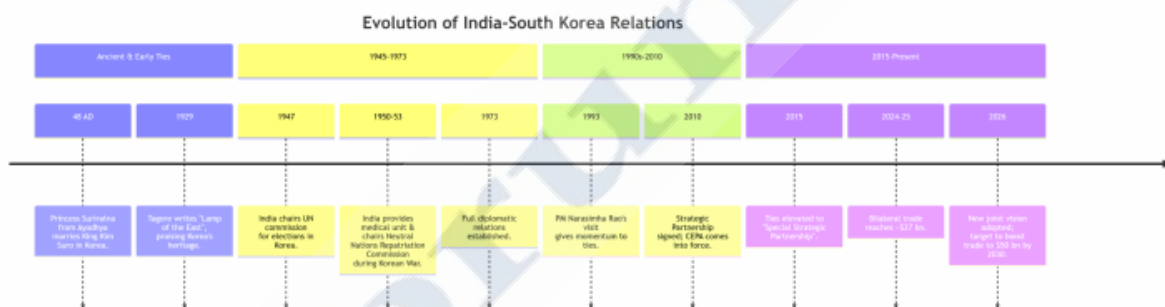
The South Korean President **Lee Jae Myung** is on a state visit to India with an aim to transform the '**trusted partnership**' between two nations into a '**futuristic partnership**'. The India-South Korea relations have advanced particularly due to united interests, mutual goodwill, and high-level exchanges. South Korea is currently the fifth largest source of investment in India.



Evolution of India-South Korea relations:

Historical & Civilizational Roots	● The Legend of Princess Suriratna: According to the <i>Samguk Yusa</i>, an Indian princess from Ayodhya traveled to Korea in 48 CE to marry King Suro, founding the Karak dynasty. This shared heritage remains a powerful cultural symbol. ● Buddhism: Introduced to Korea in the 4th century, Buddhism created an enduring intellectual and spiritual link. ● Korean War: India played a crucial role during the Korean War (1950–53), sending a medical unit and a custodian force to manage the exchange of prisoners.
1973	Formal diplomatic relations were established at the Ambassador level.

Post-Cold War Era	The relationship gained significant momentum in the post-Cold War era, aligning with India's "Look East" policy. The 1993 visit of Prime Minister P.V. Narasimha Rao to Seoul was a pivotal moment that helped revitalize bilateral engagement.
2010	Strategic Partnership: The visit of President Lee Myung-bak as the Chief Guest for India's Republic Day was a milestone, elevating ties to a "Strategic Partnership."
2015	Special Strategic Partnership: Recognizing the growing convergence of interests, the relationship was further elevated to a "Special Strategic Partnership" during Prime Minister Narendra Modi's visit to South Korea.
2026	Joint Strategic Vision (2026–2030): The two nations recently signed a Joint Strategic Vision (2026–2030) , committing to annual leader-level meetings and closer alignment on Indo-Pacific security.



What have been various initiatives to strengthen the India-South Korea relationship?

1. Economic & Trade Initiatives:

- **CEPA & CEPA Upgrade:** CEPA, which is in force since 2010, has increased the bilateral trade from \$14bn at the time of its implementation to \$27bn in 2024-25. Both nations have committed to a mission-mode upgrade of the 2009 **Comprehensive Economic Partnership Agreement (CEPA)**, aiming for completion within one year to address the huge trade deficit.
- **\$50 Billion Trade Target:** A formal roadmap has been established to increase bilateral trade from the current **\$27 billion to \$50 billion by 2030**.
- **Korean Industrial Township (Korea Enclave):** Establishment of a dedicated **"plug-and-play" industrial township** in India specifically designed to help South Korean SMEs bypass bureaucratic hurdles.
- **India-Korea Financial Forum:** A new platform launched to facilitate easier financial flows and investments between the two nations.

2. Technological Cooperation:

- **India-Korea Digital Bridge:** A new framework was signed to promote policy sharing, joint research, and private-sector exchanges in **AI, semiconductors, and quantum computing**.
 - **Space Collaboration:** ISRO and the new Korean space agency (KASA) have initiated a Joint Working Group to explore cooperation in satellite navigation and space startups.
- 3. Defence & Security Partnerships:**
- **K9 Vajra Phase III:** Following the success of the K9 Vajra howitzers, the two countries have entered “Phase III,” which moves beyond assembly to **co-development, joint design, and greater technology transfer**.
 - **Defense Accelerator:** The launch of a **Korea-India Defence Accelerator** platform to connect startups, investors, and universities for next-gen military tech like anti-drone systems.
 - **Maritime Upgrades:** A new framework for shipbuilding and maritime logistics includes an MoU for a South Korean firm to **modernize Indian shipyards** and port infrastructure.
- 4. Annual Leader Summits:** The leaders have agreed to meet **annually** to ensure high-level momentum.
- 5. Cultural & People-to-People Ties:**
- **SARANG**, a festival of India in Korea, has been organised every year by the Indian Embassy since 2015 to showcase India’s diverse art and music.
 - The two nations extended their Cultural Exchange Programme till 2030 and declared 2028–29 as the Year of India-ROK Friendship, with agreements to boost collaboration in creative industries.
- 6. The Steel Alliance:** A massive 2026 joint venture between **JSW Steel and POSCO** to set up a 6-million-tonne green steel plant in Odisha, representing a “reunion” of Korean industry with Indian resources.
- 7. Critical Minerals Value Chain:** Cooperation on mapping and exploring critical minerals using AI, with a focus on “circularity” (recovering minerals from e-waste).

What is the significance of India-South Korea relationship?

- 1. Economic & Trade Significance:**
- **Trade and Investment Engine:** Bilateral trade has grown substantially since the 2009/2010 CEPA (Comprehensive Economic Partnership Agreement), reaching around **\$27 billion** recently, with Korea as one of India’s top FDI sources.
 - **Complementary Strengths:** India’s large market, demographics, and services/IT talent pair with Korea’s advanced manufacturing, semiconductors, shipbuilding, EVs/batteries, steel, and R&D prowess.
 - **Supply Chain Resilience and Economic Security:** In a fragmented global economy, the partnership builds diversified, resilient chains in critical sectors – vital for both nations’ growth and autonomy.
- 2. Geopolitical Significance:**
- **Indo-Pacific Alignment:** Both countries share a vision for a free, open, inclusive, and rules-based Indo-Pacific. India’s **Act East Policy** converges with South Korea’s **New Southern Policy**, promoting stability, maritime security, and connectivity.
 - **Middle-Power Collaboration:** As capable middle powers without major bilateral disputes, they amplify each other’s influence – India gains a stronger East Asian foothold and bridge to ASEAN; South Korea diversifies beyond Northeast Asia and the U.S.-China rivalry.
- 3. Security Significance:** Military-to-military ties are deepening significantly. The two navies held their **first-ever bilateral exercise in October 2025**. They have also agreed to explore a **2+2 dialogue** between their foreign and defence ministers to enhance strategic coordination on regional and global issues.

4. **Technological Significance:** The focus in recent years has shifted to high-tech collaboration. A new “**India-Korea Digital Bridge**” aims to foster partnerships in **AI, semiconductors, and IT**. Major cooperation is also planned in **shipbuilding**, with a comprehensive framework signed to develop ports and maritime logistics.
5. **Soft Power:** The Hallyu (Korean Wave) phenomenon has created extraordinary organic goodwill toward South Korea in India. Reciprocally, Indian cinema and yoga enjoy growing popularity in Korea.

What are the challenges in India-South Korea relationship?

1. **Trade Deficit:** India's exports to South Korea are significantly lower than its imports. The bilateral trade of ~\$27 billion is heavily skewed, with Indian exports at ~\$6 billion vs. Korean exports at ~\$21 billion.
2. **Composition of Trade:** India mainly exports raw materials (aluminum, iron ore) while importing high-value finished goods (electronics, machinery). India is pushing for greater market access in sectors where it is globally competitive, such as **pharmaceuticals, IT services, and textiles**.
3. **Challenges with CEPA:**
 - **“Lopsided” CEPA:** The 2010 Comprehensive Economic Partnership Agreement (CEPA) is seen as flawed and has not worked in India's favor.
 - **Stalled Upgrade Talks:** Negotiations to upgrade the CEPA were launched in 2016 but have been stalled for years, failing to resolve differences.
 - **Non-Tariff Barriers:** Indian exporters frequently cite complex South Korean regulatory standards and sanitary/phytosanitary measures as hidden “walls” that prevent Indian agricultural and pharma products from entering the Korean market.
4. **Intermittent High-Level Engagement:** High-level diplomatic momentum has been inconsistent. The last state visit by a South Korean president prior to this was eight years ago, and even the 50th anniversary of diplomatic ties in 2023 passed without a commemorative bilateral summit. This has led to a perception of a lack of political will.
5. **Stalled Defence Cooperation:** While the K9 Vajra-T howitzers are a success story, other major defence deals (like minesweepers or submarines) have been stalled or cancelled due to bureaucratic hurdles, trust deficits, and disagreements over technology transfer.
6. **Seoul's Strategic Focus:** South Korea's recent foreign policy has been centered on its alliance with the US and cooperation with Japan and Southeast Asia, with India receiving relatively less strategic attention in its Indo-Pacific strategy.
7. **Limited Diaspora and Exchanges:** The number of South Koreans living in India is only about **12,000**. This presence is very small relative to India's massive population and economic weight, indicating that people-to-people ties have remained stagnant.
8. **The “China Factor”:** South Korea's economy is deeply integrated with China, making it cautious about joining security frameworks (like an expanded Quad) that could be seen as overtly anti-China. India, meanwhile, is seeking a more assertive “de-risking” strategy.

What should be the way forward?

1. **Market Access for Services:** India must pivot from exporting raw materials to high-value services. Securing easier “Mutual Recognition Agreements” (MRAs) so Indian doctors, nurses, and IT professionals can work in Korea without redundant certifications.
2. **Address Non-Tariff Barriers:** Streamlining customs clearance processes and simplifying rules of origin to make the agreement more user-friendly for businesses, particularly SMEs.

3. **Operationalize the “Korea Desk”:** India should promptly establish the promised “Korea Desk” to provide regulatory certainty and facilitate investment, while Korea should establish a corresponding unit.
4. **Institutionalizing High-Level Dialogue:** Moving beyond intermittent engagements to regular annual summits and activating the proposed **2+2 Vice-Ministerial dialogue** between foreign and defence ministries.
5. **Semiconductor Hubs:** Moving beyond trade to manufacturing. The South Korean giants (like Samsung or SK Hynix) must be encouraged to set up **complete fabrication units** in India, rather than just testing and packaging.
6. **Joint R&D Platforms:** The proposed **Korea-India Defence Accelerator** should be used to co-develop niche technologies like underwater drones, cyber-defense systems, and small satellite launch vehicles.
7. **Shipbuilding as a Strategic Sector:** Shipbuilding is an underexplored but high-potential area. India has a strong ambition to become a global shipbuilding hub, and South Korea is the world’s leading shipbuilder. Thus, joint ventures, technology sharing, and the integration of Indian yards with Korean expertise must be explored.
8. **Scaling Up People-to-People and Educational Ties:** The human dimension of the relationship remains thin relative to the scale of the two economies. Boosting the Korean diaspora in India, expanding scholarship programmes, increasing student exchanges, and investing in Korean language teaching in India and Indian studies in South Korea would create a larger community of people invested in the relationship.

Conclusion: India & South Korea must realize the new opportunities for cooperation in every field, from chips to ships, talent to technology, environment to energy – to ensure the progress & prosperity of both the nations.

Read More: [Indian Express](#)

UPSC GS-2: International Relations

Diversification Towards High Value Crops – Significance & Challenges – Explained Pointwise

Agriculture occupies a foundational place in the vision of a **Viksit Bharat**. Over the past decade, the sector has grown at **4.45%**, the highest in comparison to previous decades. This growth tells a deeper story. A story of diversification and value enhancement. At the centre of this transformation lies horticulture, which has emerged as the nucleus of India’s high-value crop economy.



Source: Krishi Jagran

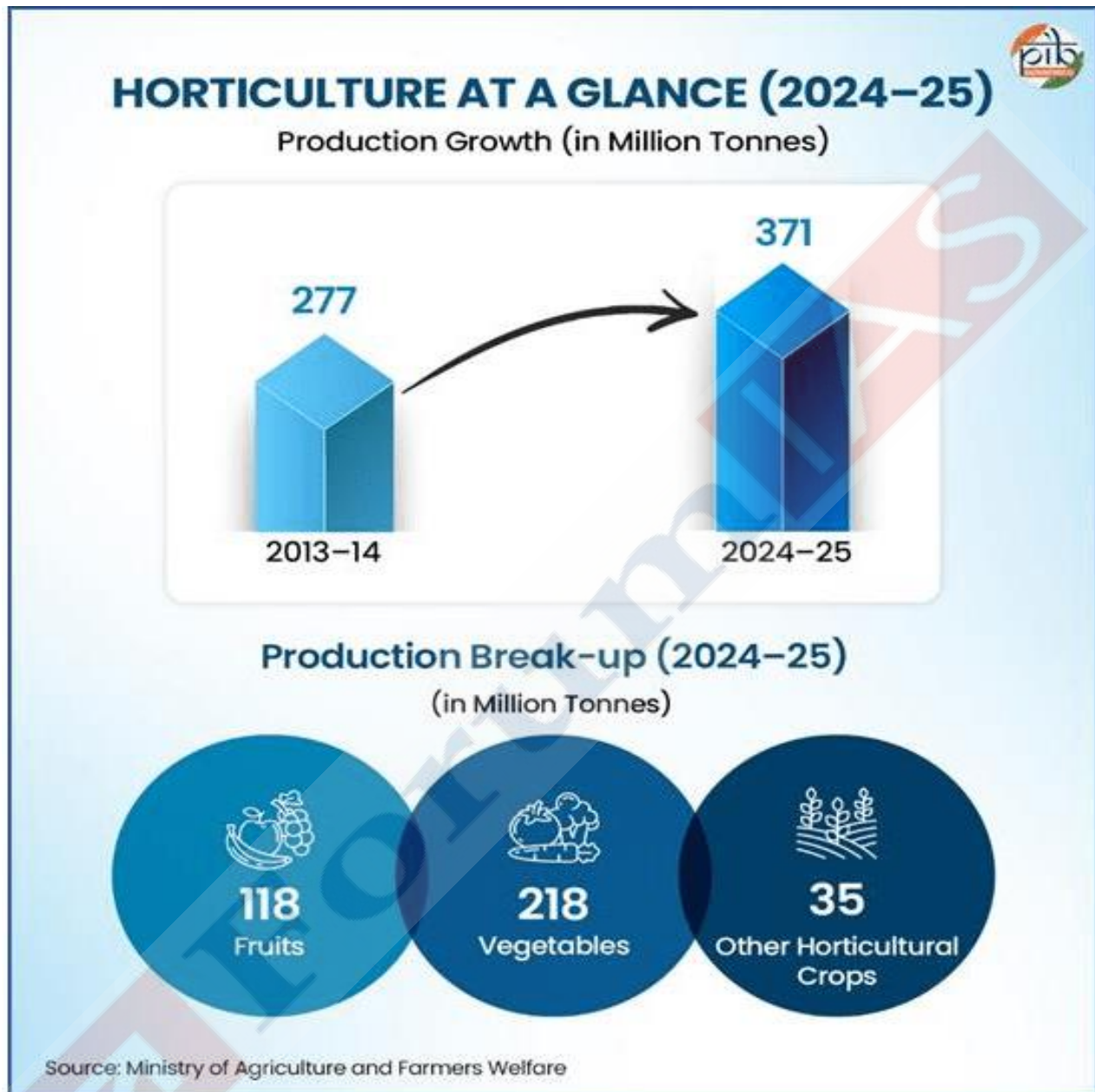
What are High Value Crops?

- High-value crops primarily refer to horticultural produce such as fruits, vegetables, flowers, spices, and aromatic plants. These crops are termed **"high value"** because they generate significantly higher net returns than traditional staple crops like cereals and pulses.
- Unlike traditional staples, high-value horticultural crops generate superior returns per unit of land and contribute substantially to agricultural gross value addition.

Horticulture as a Driver of Agricultural Growth in India:

- The horticulture sector accounts for approximately **37% of the Gross Value Output (GVO)** within the agricultural crops sub-sector of Agriculture and Allied sectors and has emerged as a cornerstone of India's agricultural growth trajectory.
- Horticulture strengthens nutrition, fuels agro-processing, supports exports, and creates local employment.
- In India's journey toward sustainable and income-led agricultural growth, horticulture is not peripheral. It is pivotal.
- India's global standing in horticulture further reinforces its strategic importance:
 - The country ranks second worldwide in the production of vegetables, fruits and potato.
 - Fruits account for **9.18%** and vegetables account for **8.18%** of global production.
 - Additionally, India is the world's largest producer of onions and shallots, contributing close to **22.42%** of global production.

These indicators highlight India's growing integration into global food supply chains and the significant potential of a high-value crop economy.



Key Characteristics of High Value Crops:

1. **High Market Price:** They command a premium price because of their quality, uniqueness, or limited supply.
2. **Intensive Management:** They typically require more labor, precise growing conditions, specialized skills, and controlled environments (like greenhouses or vertical farms).
3. **Perishability:** Many HVCs (like fresh herbs or berries) are highly perishable, necessitating quick, efficient logistics and access to a reliable market.

4. **Niche/Specialty Market:** They are often sold to specific markets, such as fine-dining restaurants, organic food stores, health/wellness industries, or directly to consumers.
5. **Profit per Area:** The financial return (profit) is high relative to the small amount of land or space they occupy.

Examples of High Value Crops:

Fruits	Pomegranate, dragon fruit, black rice, baby corn, mango, grapes, guava, oranges.
Vegetables	Tomatoes, onions, okra, capsicum, baby corn.
Flowers & Ornamentals	Marigold, rose, orchids
Spice & Condiments	Saffron, cardamom, turmeric, ginger, black pepper, chili.

Coconut



India's Coconut Sector at a Glance

-  **Global Standing**
 - India ranks **second** in the world in coconut production
-  **Production Snapshot (2024-25)**
 - Production: **13.97 Million Tonnes**
 - Area: **2.19 Million Hectares**
 - Productivity: **6.36 Tonnes Per Hectares**
-  **State-wise Leadership (Jan 2026)**
 - Keralam 1st** in area under cultivation
 - Tamil Nadu 1st** in production
 - Andhra Pradesh 1st** in productivity

Source: Ministry of Agriculture and Farmers Welfare

Source: PIB

Cashew



CASHEW

The Gold Mine of Wasteland



Cultivation and Production

- ▲ Total Area: 12.05 Lakh Hectares
- ▲ Annual Production: Over 8.02 Lakh Tonnes

Export Performance (FY 2024-25)

- ▲ Total Export Value: 369.17 USD Million

Major Export Destinations

- ▲ United Arab Emirates, Vietnam, Japan, Netherlands, Saudi Arabia

Source: Ministry of Commerce and Industry

Source: PIB

Cocoa	 Cocoa Cultivation and Export Profile in India Major Cocoa Growing States Andhra Pradesh, Keralam, Karnataka, Tamil Nadu Export Performance (FY 2024-25) Export Value: 295.58 USD Million Production Snapshot (2024-25) Total Production: 32.91 thousand metric tonnes Major Export Destinations U.S.A, Netherlands, UAE, Indonesia, Nepal Source: Ministry of Agriculture and Farmers Welfare Source: PIB
Sandalwood	<i>Santalum album</i>, commonly known as Indian sandalwood or chandan, is a highly valuable and culturally significant tree species in India. It is widely used in religious practices and is globally renowned for its premium essential oil, which is extensively used in the perfumery and fragrance industries. Due to its high economic value, sandalwood cultivation has strong potential to generate rural employment and increase export earnings through value-added products.

Nut Crops

India's hilly regions cultivate several nut crops suited to cooler climates and specific agro-ecological conditions, including walnuts, almonds, and pine nuts.



Source: PIB

Significance of High Value Crops:

- 1. Doubling of Farmer Income:** High value crops (HVCs) yield much higher returns per acre than staple crops like rice or wheat, offering farmers opportunities for greater profitability and improved livelihoods. They are crucial for increasing smallholder incomes and supporting rural prosperity, which aligns with national goals of doubling farmer income.
- 2. Agricultural diversification:** Shifting land from low-value staples to HVCs such as fruits, vegetables, spices, and flowers reduces risk, stabilizes farmer incomes, and helps balance food supply with demand. It also makes agriculture more resilient to market shocks and climatic variability.
- 3. Employment generation:** HVC cultivation is labor-intensive and stimulates job creation in production, harvesting, processing, packaging, and marketing, particularly benefiting women and rural youth. The rise of agro-processing and supply chains for HVCs further adds off-farm employment opportunities.
- 4. Export Potential:** Many Indian HVCs like spices, mangoes, pomegranates, and medicinal herbs have strong export markets, contributing significantly to the country's agri-exports and foreign exchange earnings. Enhanced value-addition and product quality increase competitiveness in global markets.

5. **Sustainable development:** HVCs can be grown in less arable or rainfed areas, thus supporting sustainable use of marginal lands and water resources. Many of them, especially perennial and medicinal plants, support better soil health, biodiversity, and climate resilience.

Challenges to High Value Crops:

1. **Market Access:** Poor access to organized markets and insufficient cold storage/logistics frequently lead to high post-harvest losses and distress sales.
2. **Price Fluctuations:** HVC producers often face volatile market prices due to seasonal gluts, weak supply chains, and inadequate market intelligence.
3. **High Input Cost:** HVC cultivation requires improved seeds, fertilizers, pest management, and irrigation, which can be costly and harder to access for smallholders.
4. **High Technological Requirements:** Limited knowledge of advanced agronomy, protected cultivation (greenhouses), and precision agriculture affects yields and quality.
5. **Risk & Vulnerability:** High value crops are often sensitive to weather fluctuations, pests, and diseases, and carry higher investment risks than staples. Crop insurance coverage is limited, leaving growers vulnerable to income losses during adverse years.
6. **Policy & Institutional Support:** Support for HVCs is generally less than for staple crops in terms of government subsidies, minimum support prices, and extension services.
7. **Export Barriers:** Meeting international quality and phytosanitary standards for export can be complex and costly. Farmers need better support for certification, grading, and value addition.
8. **Limited Access to Finance:** High upfront costs for planting materials, inputs, pack-houses, and processing units make access to timely credit and affordable loans essential, but such support remains patchy.

Government initiatives to promote the cultivation of high value crops:

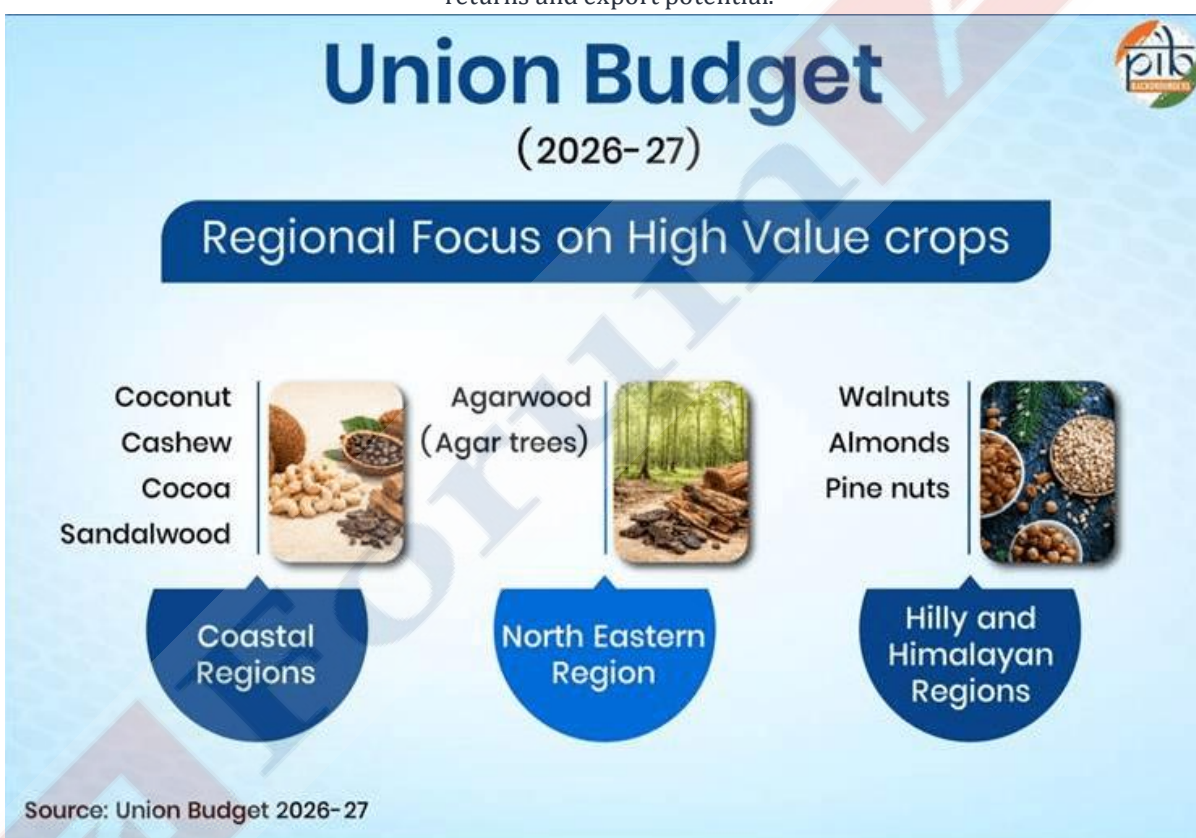
1. **Mission for Integrated Development of Horticulture (MIDH):**
 - A centrally sponsored scheme supporting area expansion, improved varieties, subsidies for planting materials, creation of water resources, and promotion of protected cultivation (greenhouses, polyhouses).
 - Offers financial incentives for hybrid vegetables, off-season cultivation, perennial spices, cashew, cocoa, and Moringa with substantial per hectare subsidies.
2. **Operation Greens:**
 - Targets price stabilization, improved logistics, and post-harvest management for Tomato, Onion, and Potato (TOP) crops, later expanded to all fruits and vegetables.
 - Provides support for cold storage, value addition, transportation, and market linkages to protect growers from distress sales and reduce losses.
3. **Horticulture Cluster Development Programme:**
 - Focuses on geographic clusters for integrated, market-driven development of specific high value crops.
 - Strengthens exports, competitiveness, and productivity through infrastructure and technology support.
4. **National Horticulture Board:** Facilitates establishment of nurseries, pack houses, cold stores, and ripening chambers, and supports Bharat GAP certification for quality and export standards.
5. **Kisan Rail & Kisan Udaan:** Special trains and air cargo services to transport fruits, vegetables, and perishables rapidly to distant urban and export markets, with up to 50% transportation subsidy.
6. **Minimum Support Price (MSP) & Price Support Scheme:**

- MSPs for pulses, oilseeds, nutri-cereals, and select commercial crops (including horticultural crops) set at least 1.5 times the average production cost to ensure remunerative returns.
- Price Deficiency Payment Scheme (PDPS) and Market Intervention Scheme (MIS) support growers against price volatility for perishables and horticulture crops.

7. Union Budget 2026-27 Focus on High Value Crops:

- The **Union Budget 2026-27** emphasized a crop-specific, regionally differentiated strategy to promote high-value agriculture, acknowledging its capacity to enhance farm incomes and diversify production systems.
- Targeted interventions have been proposed for **coconut**, **sandalwood**, **cocoa**, and **cashew** in coastal regions; **agarwood** cultivation in the North Eastern States; and **premium nuts** such as **almonds**, **walnuts**, and **pine nuts** in hilly areas.

This geographically aligned policy framework seeks to leverage region-specific agroclimatic advantages, strengthen value chain integration, and incentivise a structural shift towards crops with higher economic returns and export potential.



- The Union Budget has proposed promoting **focused cultivation** and **strengthening post-harvest processing** of sandalwood.
- It also emphasise **expanding cultivation**, **strengthening processing capacity**, and **enhancing the export potential** of agarwood from the North-Eastern Region.
- It has proposed a **Coconut Promotion Scheme** to **increase production and productivity**, including replacing ageing and low-yielding trees with improved saplings and high-yielding varieties in major coconut-growing states.

8. Directorate of Cashewnut and Cocoa Development: Dedicated institutional mechanisms have been established at the national level to promote the organised development of **cashew and cocoa cultivation** across India. The Directorate is responsible for formulating and implementing development

programmes for cashew and cocoa, and also monitors schemes carried out by state governments under the MIDH.

What Should be the Way forward?

1. Strengthen Market Linkages and Infrastructure:

- Expand direct farmer access to organized markets, contract farming, and online trading platforms such as e-NAM.
- Scale up cold storage, pack-houses, and efficient logistics for fruits, vegetables, spices, and flowers to reduce post-harvest losses and improve bargaining power.

2. Focus on Coastal Region Crops: Coconut, Cashew, Cocoa, and Sandalwood:

India has a long coastline with numerous small and large islands. These coastal regions are home to a significant population and are characterised by diverse climate, topography, soils, livestock, fisheries, and crops. Such favourable agro-ecological conditions support the cultivation of high-value crops such as coconut, cashew, cocoa, and sandalwood, thereby strengthening livelihoods in coastal areas.

3. Promote Technology Adoption & Extension Services:

- Increase outreach and training on advanced agronomic practices, precision farming, protected cultivation (polyhouses, greenhouses), and integrated pest management to improve productivity and quality.
- Support Centres of Excellence and demonstration farms for capacity building and technology transfer.

4. Expand Credit & Financial Support:

- Enhance timely access to affordable credit, subsidies, and crop insurance targeted for high value crop growers.
- Encourage investment in processing, value addition, and packaging to generate higher returns and employment.

5. Risk Management & Climate Resilience:

- Provide crop insurance coverage and disaster risk support specifically for horticultural and high value crops.
- Promote climate-resilient varieties and water-efficient cultivation practices for smallholders and rainfed areas.

6. Policy & Institutional Support:

- Streamline regulatory frameworks to support land aggregation, direct marketing, farmer producer organizations (FPOs), and export facilitation.
- Ensure robust extension services for high value crop promotion, grading, certification, and export market access.

7. Focus on Quality Standards & Export Promotion:

- Strengthen support for quality certification, grading, and phytosanitary standards needed for domestic and international markets.
- Invest in market intelligence and branding for Indian high value crops to boost competitiveness abroad.

Conclusion: The Union Budget 2026-27 marks a strategic shift towards **crop-specific and regionally aligned strategies** for promoting high value agriculture in India. Complementary measures, including institutional support, export-oriented interventions, and productivity enhancement programmes, further underscore the growing role of horticulture in advancing agricultural development. Collectively, these initiatives position high-

value crops as a key pathway for **diversification**, **value addition**, and **enhanced farmer incomes** within India's evolving agricultural landscape.

UPSC GS-3: Agriculture

Read More: [PIB](#)

Railway Sector in India – Significance & Issues – Explained Pointwise

The Indian Railways (IR), often called the lifeline of India, is central to the country's socio-economic development. Since its establishment in 1853, it has grown into one of the world's largest and busiest railway networks. **Covering over 68,000 km of track**, it serves more than 23 million passengers daily and ranks as the **fourth-largest railway system** globally, after the US, China, and Russia.



What is the Significance of Indian Railways?

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1. Economic Significance:

- a. Freight Transport:** Railways are indispensable for moving bulk commodities like coal, cement, iron ore, petroleum products, fertilizers, and agricultural goods. In **FY25**, Indian Railways loaded **1,617 million tonnes (MT)** of freight, generating revenue of **₹1.75 lakh crore (US\$ 20.5 billion)**.
- b. Revenue Contribution:** Overall revenue in FY25 reached **₹2.70 lakh crore (US\$ 31.57 billion)**, with **freight accounting for approximately 65%** and passenger services making up the rest.
- c. Industrial Development:** Railways ensure smooth industrial and port connectivity, enabling **efficient supply chains** for FMCG, automobiles, containerized cargo, and consumer durables thus enhancing India's economic competitiveness.

2. Social Significance:

- a. Mass Connectivity:** With over **13,000 passenger trains**, including Mail, Express, suburban, and local services, Indian Railways links urban centers and remote villages alike, bringing people together across regions.
- b. Affordability:** For millions of Indians, rail transport remains the **most cost-effective mode** of long-distance travel, ensuring accessibility and social inclusion.
- c. Employment Generation:** As one of the **largest employers** in the country, Indian Railways provides livelihoods to millions directly and indirectly, supporting national socio-economic stability.

3. Environmental Significance:

- a. Energy Efficiency:** Rail transport consumes significantly less energy per **tonne-km for freight** and per **passenger-km** compared to road or air transport, making it an environmentally friendly option.
- b. Electrification:** Nearly **97% of broad-gauge lines are electrified**, aligning with India's sustainability goals under the Paris Agreement and reducing dependency on fossil fuels.

Market Size and Economic Impact:

Passenger Traffic	India maintains the record of highest number of passengers travelling by Indian Railways at over 7.63 billion during 2025-26. With these numbers, India ranks first globally, followed by China. Globally, of the 3 trillion passengers transported by railways, India and China combined account for >50%. However, >50% of passengers in India are suburban commuters. Of the bulk of Indian Railways' over 20 million passengers daily, >50% are daily commuters, mostly confined to metropolitan cities such as Mumbai, Chennai, Delhi, Hyderabad, and Kolkata.
Revenue from Passenger Traffic	₹94,927 crore (US\$ 11.10 billion) in FY25, up from ₹70,693 crore in FY24.

Revenue from Freight Traffic	₹1.75 lakh crore (US\$ 20.50 billion) in FY25, up from ₹1.68 lakh crore in FY24.
FDI in Railway Sector	₹9,155 crore (US\$ 1.42 billion) between April 2000 and December 2024.
Capital Outlay	Budget 2024-25 allocated ₹2.52 lakh crore (US\$ 30.3 billion) for infrastructure and modernization.

Structure and Governance of Indian Railways:

- The **Ministry of Railways** oversees policy-making, budget allocation, project approvals, and strategic guidance, while the **Railway Board** manages daily operations and long-term planning.
- The Indian Railways comprises **18 operational zones**, with the South Coast Railway (SCoR) officially becoming the 18th zone. Each zone is further divided into divisions, headed by **Divisional Railway Managers**, who supervise local operations, track maintenance, safety, and revenue collection.
- **Key Responsibilities:**
 1. **Ministry of Railways:** Policy formulation, budget allocation, project approvals, facilitation of FDI.
 2. **Railway Board:** Operational oversight, modernization initiatives, safety regulation, and coordination among zones.
 3. **Zonal Railways:** Maintenance of tracks, rolling stock management, and daily passenger and freight operations.

What Have Been the Various Govt Initiatives Towards Modernization and Technological Advancements of Indian Railways?

Indian Railways has embraced **cutting-edge technology** to enhance operational efficiency, passenger experience, and safety.

1. Track Modernization:

- a. Over **55,000 km** of tracks have been renewed since 2014. Currently, 80% of the network is fit for speeds of 110 km/h or above, supported by **thick-web switches** and **long welded rails** to reduce jerks and noise.
- b. **Track Management System (TMS)** is now being used, which is an **IT-enabled platform used for monitoring, inspection, and maintenance of railway tracks**. It brings together data from ultrasonic testing, ride quality readings and track geometry into one platform, making it easier to set priorities & act in time.

- C. As a result of various initiatives towards strengthening & modernization of railway tracks – the speed potential of the Indian tracks have improved tremendously – which has led to reduced journey times, improved punctuality, and made it possible to run semi-high-speed services like the Vande Bharat Express.

SPEED (KMPH)	2014		2026	
	Running Track Km	%	Running Track Km	%
130 & above	5,036	6.3	24,173	22.5
110-130	26,409	33.3	62,482	58.2
Below 110	47,897	60.4	20,679	19.3
Total	79,342	100	1,07,334	100

Source: Indian Express

2. High-Speed & Semi-High-Speed Trains:

- a. **Vande Bharat Express:** These are **semi-high-speed (160–180 km/h)** self-propelled trains, these trains are equipped with onboard infotainment, GPS-based passenger information, automatic doors, retractable footsteps, vacuum bio-toilets, and CCTV cameras. As of April 2026, 79 Vande Bharat trains are in service. India aims to export these semi-high-speed trains to **Europe, South America, and East Asia** by 2025-26.
- b. **Bullet Train (MAHSR):** The Mumbai–Ahmedabad High-Speed Rail project is the flagship high-speed initiative using Japanese Shinkansen technology.
- c. **Amrit Bharat Trains:** While Vande Bharat targets premium segments, the Amrit Bharat initiative provides high-speed, non-AC travel with modern LHB (Linke Hofmann Busch) technology for the general public.

3. Safety Technologies:

- a. **KAVACH:** An indigenous **Train Collision Avoidance System** being rolled out over **37,000 km of track**, reducing the likelihood of collisions. It automatically applies brakes if the loco pilot fails to do so, preventing head-on or rear-end collisions.
- b. **Automatic Signaling:** Approximately **15,000 km of track** have been upgraded to automatic signaling, minimizing human error.
- c. **Safety Improvements:** About 17,500km of safety fencing has been installed, especially where trains run above 110kmph, helping prevent trespassing by people & cattle. Consequential rail accidents declined by **89% between 2014-15 to 2025-26**, though **95% of accidents** are still linked to driver errors, highlighting the importance of further technological interventions and comprehensive training programs.

4. Digitisation and Connectivity:

- a. **Wi-Fi:** Available at **6,045 stations**, connecting millions of passengers to the digital world.
- b. **SwaRail Super App:** A unified digital platform launched in 2026 that integrates IRCTC (ticketing), UTS (unreserved tickets), and Rail Madad (complaints) into a single interface.
- c. **Track Management System (TMS):** A web-enabled platform that uses ultrasonic testing data to predict track failures before they happen.

5. Sustainability & Green Energy:

- a. **Net Zero:** Indian Railways aims to be a **Net Zero Carbon Emitter by 2030**.
- b. **100% Electrification:** As of March 2026, nearly **99.6%** of the broad-gauge network is electrified, drastically reducing diesel consumption.

- c. **Dedicated Freight Corridors (DFCs):** The Eastern and Western DFCs (over 96% complete) allow heavy freight to move on separate tracks at higher speeds, reducing the carbon footprint of logistics and freeing up passenger lines.
 - d. **Hydrogen Trains:** Small-scale pilots for hydrogen-fuel-powered trains have begun on heritage routes to test zero-emission technology.
6. **Amrit Bharat Station Scheme:** Over **1,300 stations** are being redeveloped. The focus has shifted from simple repairs to creating “**City Centres.**” These include roof plazas, shopping zones, and seamless integration with city transport (Metros/Buses).

What are the various challenges and issues faced by India's Railway Sector?

1. **Infrastructure Overload:** Many routes operate at over **150% of their designed capacity**, causing congestion, delayed maintenance, and higher accident risks.
2. **Safety Concerns:** Outdated technology, human error, unmanned level crossings, and inadequate driver training contribute to accidents. Committees such as **Kakodkar (2012)**, **Bibek Debroy (2014)**, **Vinod Rai (2015)**, and **Rakesh Mohan (2010)** have recommended comprehensive reforms in safety, regulation, and human resources.
3. **Financial Constraints:** Populist fare policies and limited private investment strain finances, affecting infrastructure development, modernization, and technological upgrades.
4. **Organizational Bottlenecks:** Excessive centralization and political interference slow down decision-making and project implementation. Experts emphasize the need for **corporatization, decentralization, and autonomous zonal operations.**
5. **Human Resource and Service Quality Issues:** Staff shortages, inadequate training, long working hours, and gaps in service quality—including cleanliness, food, and punctuality—affect operational efficiency and passenger satisfaction.

What are the key reforms undertaken in the Indian Railways sector?

1. **Financial and Administrative Reforms:**
 - **Dynamic Fare Pricing:** Helps optimize revenue from passenger services while balancing affordability.
 - **Merger of Rail and Finance Budgets:** Ensures a unified approach to funding major infrastructure projects.
 - **Rail Infrastructure Development Fund (RIDF):** Provides long-term financing for rail network development.
 - **Rail Drishti Portal:** Promotes transparency and accountability by offering real-time operational insights.
2. **Organizational Restructuring:**
 - **Indian Railway Management Service (IRMS):** A unified management cadre to improve operational efficiency.
 - **Digital HR Systems:** Streamlined employee monitoring and management for better administrative control.
3. **Infrastructure Development:**
 - **National Rail Plan (NRP) 2030:** Lays out a roadmap to meet traffic demands projected for 2050.
 - **Vande Bharat Trains:** India's semi-high-speed trains, designed to meet global standards.
 - **Dedicated Freight Corridors (WDFC & EDFC):** Supported by Japan and the World Bank to decongest passenger lines and enhance freight efficiency.

4. Safety and Security:

- **Railway Safety Fund (RSF):** Targets elimination of unmanned level crossings to reduce accidents.
- **Zero Accident Mission & KAVACH:** Advanced systems aimed at preventing collisions.
- **MeriSaheli Initiative:** Focused on ensuring women's safety on trains and stations.
- **CORAS Railway Commando Battalion:** Special units for counter-terrorism and anti-Naxal operations.

5. Freight and Logistics:

- **Freight on Priority Policy:** Ensures timely and customer-focused freight services.
- **Kisan Rail:** Dedicated trains for transporting agricultural produce efficiently.
- **Gati Shakti Cargo Terminal Policy:** Encourages development of cargo terminals to support multi-modal logistics.

6. Tourism Promotion:

- **Bharat Gaurav Scheme:** Theme-based trains designed to promote tourism and enrich passenger experience.

7. Railways (Amendment) Bill, 2024:

- Provides statutory backing to the Railway Board.
- Modernizes outdated provisions from the Indian Railway Board Act of 1905.
- Introduces independent regulators for tariffs, safety, and private sector participation.
- Grants greater autonomy to individual railway zones for efficient functioning.

Recommendations from Expert Committees:

- **Kakodkar Committee (2012):** Statutory Railway Safety Authority, non-lapsable safety fund, advanced technology adoption.
- **Bibek Debroy Committee (2014):** Outsourcing non-core activities, separating budget, Railway Infrastructure Authority.
- **Vinod Rai Committee (2015):** Independent Railway Safety Authority, Railway Accident Investigation Board, performance-linked incentives.
- **Rakesh Mohan Committee (2010):** Accounting reforms, expansion into FMCG, containerized cargo, and inter-city high-speed corridors.

What are the measures that should be taken to improve the Railway Sector?

- 1. Modernisation of Infrastructure:** Tracks, stations, locomotives, and signaling systems need significant upgrades. Emphasis should be placed on **high-speed trains and LHB coaches**, while **ICT integration** can enable real-time monitoring, mobile ticketing, and enhanced passenger services.
- 2. Safety Enhancement:** Establishing an independent **Railway Safety Regulatory Authority** is crucial to enforce strict safety standards. Efforts should also focus on eliminating manned and unmanned level crossings, upgrading signaling systems, and implementing advanced technologies like KAVACH to prevent collisions.
- 3. Integrated Multimodal Logistics:** Developing logistics parks, intermodal hubs, and door-to-door freight solutions will enhance supply chain efficiency and reduce congestion on passenger routes.

4. **Public-Private Partnerships (PPP) and FDI:** Encouraging private operators and foreign investment in both freight and passenger services can bring in global technology, expertise, and improved service standards, boosting overall efficiency.
5. **Human Resource Reforms:** Addressing **staff shortages**, improving **training programs**, professionalizing recruitment, and focusing on employee welfare and productivity will help reduce errors and operational delays.
6. **Commercial Utilisation of Railway Land:** Optimizing railway-owned land and airspace for retail, real estate, and industrial projects can generate non-fare revenue, which can be reinvested into infrastructure and modernization.
7. **Customer Service Improvements:** Enhancing punctuality, cleanliness, and food quality, along with digital ticketing and real-time train tracking, will significantly improve the overall passenger experience and satisfaction.

UPSC GS-3: Indian Economy – Transportation Infrastructure

Read More: [Indian Express](#)

Political Reservation for Women – Arguments in Favour & Against – Explained Pointwise

Women make up roughly half the world's population but are severely underrepresented in legislatures globally. As of recent data, women hold only about **26% of parliamentary seats worldwide**. Similarly, in India, women Members of Parliament constituted only about 13.63% of the Lok Sabha following the 2024 General Election. Although women's representation in the Lok Sabha has increased over time—reaching around 14% in the 17th Lok Sabha (2019–2024) – it still remains significantly below the global average of approximately 26%.

Thus, to enhance women's representation in the legislature, the Parliament of India enacted the *Nari Shakti Vandan Adhiniyam* in 2023. However, the demand for political reservation for women is not recent and has evolved over several decades.



What has been the history of political reservation for women?

- **During the National Movement:** The three women's bodies sent a letter to the British Prime Minister in 1931 seeking political reservation.
- **Constituent Assembly:** The issue of women's reservation also came up in Constituent Assembly debates. However, it was rejected on the grounds that a democracy is expected to give representation to all groups.
- **73rd and 74th amendments:**
 - The **Committee of the Status of Women in India (1971)** and The **National Perspective Plan for Women (1988)** recommended reservation of women in the local bodies.
 - These recommendations paved the way for the 73rd and 74th amendments to the Constitution which mandate all State governments to reserve **one-third (33%) of the seats** for women in the local bodies. This included reservation for women within the quotas for SC/ST categories.
- **Decades of Deadlock (1996–2023):**
 - **1996:** The Women's Reservation Bill (81st Amendment Bill) was first introduced but lapsed.
 - **1998–2008:** Various versions were introduced but faced intense pushback, often resulting in chaotic scenes in Parliament.
 - **2010:** The Rajya Sabha passed the Bill, but it was never taken up in the Lok Sabha and eventually lapsed again.
- **Nari Shakti Vandan Adhiniyam (2023):** In September 2023, history was made during a special session of Parliament held in the new Parliament building. The **Constitution (128th Amendment) Bill**, also known as the **Nari Shakti Vandan Adhiniyam**, was passed with near-unanimous support.

Types of Quota Systems used globally:

Legislative Quotas	Seats reserved by law e.g. ● India = 73rd & 74th Constitutional Amendment Act reserved 33% of seats for women in local bodies. ● Rwanda = Constitution reserves 30% seats for women. ● Nepal = Constitution mandates 33% representation of women ● Pakistan = About 17% seats reserved in National Assembly ● Bangladesh = Reserved seats in Parliament filled through proportional representation
Voluntary Party Quotas	Political parties voluntarily reserve a share of candidacies for women e.g. ● Sweden = Political parties follow "zipper system" (alternating men & women) ● Norway = Major parties have internal quotas (around 40%)
Candidate Quotas	Laws requiring parties to field a minimum percentage of women candidates e.g. ● France = Parties must field 50% women candidates

	● Mexico = “Gender parity” law ensures 50% women candidates ● Brazil = At least 30% women candidates mandated
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What are the arguments in favour of women reservation?

1. **Right to Equality (Article 15(3)):** The Indian Constitution itself provides the basis for this. While Article 15(1) prohibits discrimination, **Article 15(3)** explicitly allows the state to make “special provision for women and children.” Reservation is a positive, enabling provision to achieve *substantive* (real-world) equality.
2. **Deepening Representative Democracy:** A true democracy requires the legislature to mirror the population it serves. With women consistently making up over 48% of India’s population, a parliament or assembly with less than 10-15% women suffers from a “representation deficit.”
3. **Challenging the Patriarchal Mindset of Society:** Indian society has a millennia-old history of patriarchy that systematically denied women education, property rights, and a public voice. For e.g. the **Hindu Succession Act**, which gives daughters equal inheritance rights to ancestral property, was only passed in **2005**. For generations before that, women were deliberately kept economically dependent. Reservation is a form of compensatory justice for this long history of exclusion.
4. **Focus on “Welfare” vs. “Public Works”:** A substantial body of research, including work by economists like **Esther Duflo**, shows that women leaders in Gram Panchayats prioritize infrastructure that directly addresses daily survival needs. They are statistically more likely to invest in **drinking water, sanitation, healthcare, and nutrition**. In contrast, male-led councils often prioritize “visible” public works like roads and bridges.
5. **Women-centric Issues:** When women are present in legislatures, issues like maternal health, domestic violence, child nutrition, education, and gender-based discrimination receive greater legislative attention. Research shows women legislators tend to raise women-centric issues more consistently.
6. **Critical Mass Theory** Political scientists argue that women need to form at least **30-35% of a legislature** to influence policy meaningfully without being marginalized — reservation is the fastest route to crossing that threshold.
7. **Role Model Effect:** Political representation encourages girls and young women to pursue education and professional careers, creating a “ripple effect” of empowerment across society.

What are the arguments against women reservation?

1. **Violation of Principle of Meritocracy:** Opponents claim that seats should go to the “most qualified” candidate, regardless of gender. They argue that reservation, by definition, means a less qualified woman could win over a more qualified man simply because of her gender. It might lead to “perceived incompetence,” where even highly capable women are seen as having won only because of a quota.
2. **The “Proxy” Candidate Concern (Pati-Panchayat):** In local bodies, it is common to see men fielding their wives or daughters to keep a seat “in the family.” The woman may hold the official title, but the male relative exercises the actual power. Thus, it does not empower women but rather institutionalizes their subordination.
3. **Insult to Women’s Capabilities:** Ironically, this was the *original* argument made by women leaders in the Constituent Assembly. They argue that by demanding a reserved quota, women were admitting they could not win in a fair, open election. To them, true empowerment meant competing on equal terms, not being handed seats.

4. **Intra-Women Inequality** Reservation may disproportionately benefit upper-caste, educated, urban women, leaving behind Dalit, tribal, and rural women — unless accompanied by sub-quotas.
 5. **Women not Homogeneous Group like caste groups:** Women are not a homogenous community unlike a caste group. As a result, the same arguments used to justify caste-based reservations cannot be used to justify reservations for women. Women's interests **cannot be isolated from other social, economic and political strata**.
 6. **Restriction of Choice of Voters:** Reservation of seats for women would restrict the choice of voters.
- What should be the Way Forward?**

1. **Dual-Member Constituencies:** Instead of making a seat “women-only” and displacing male candidates, certain constituencies would elect **two members**: one man and one woman.
2. **Proportional Representation (List System):** Most of the world's leaders in gender parity (like Sweden or Rwanda) don't reserve individual geographical seats. Instead, they use a **Party List System**. Political parties would be legally required to alternate male and female names on their candidate lists (e.g. Position 1: Woman, Position 2: Man). This ensures 33% or 50% women in the House without having to “reserve” the seat. It also shifts the burden of finding candidates onto the political parties, forcing them to build a pipeline of female leaders.
3. **Mandatory Party Quotas:** Rather than the government reserving seats, the law could mandate that all recognized political parties must give 33% of their total tickets to women across the country. It allows women to contest from any seat they choose, rather than being restricted to “reserved zones.”
4. **Grassroot Empowerment of Women:** Strengthen women's agencies and organizations for building a progressive society with equality of opportunities among all citizens. Promote girl's participation in College/Universities student political parties and political debate to increase their political prowess for future.

Conclusion: Political reservation for women is best understood as a **necessary but not sufficient** condition for gender equality in governance. It is a powerful tool to break open the doors of political power, but lasting change requires simultaneously addressing the deeper social, economic, and cultural barriers that keep women out of politics. The most effective systems combine **legal quotas with strong party support, voter education, and safety for women in public life** — creating conditions where reservation becomes the ladder, not the ceiling.

UPSC GS-2: Indian Polity
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Anti-Defection Law – Explained Pointwise

Recently, seven Rajya Sabha MPs from a political party (out of a total of ten) switched allegiance to another party. However, they will not face disqualification under the Anti-Defection Law due to the ‘merger’ provision. In this context, it becomes important to understand the Anti-Defection Law in a comprehensive manner.



Source: Indian School of Democracy

What is Anti-Defection Law?

- The 10th Schedule of the Constitution, also known as **Anti-Defection Law**, addresses disqualification of **MPs and MLAs for defection**, a response to the political instability of the late 1960s when “**party-hopping MLAs**” toppled multiple state governments.
- Under the 10th Schedule, a member of either Parliament (MPs) or a State Legislature (MLAs/MLCs) can be disqualified if:
 1. **Voluntary Resignation:** They voluntarily give up their membership of the political party on whose ticket they were elected.
 2. **Defying the Whip:** They vote or abstain from voting in the House contrary to the directions (the “whip”) issued by their political party without prior permission.
 3. **Independent Members:** An independent candidate joins any political party after being elected.
 4. **Nominated Members:** A nominated member joins a political party after **six months** from the date they took their seat.
- **Exceptions:**
 1. **Merger:** If at least **two-thirds** of the members of a legislative party agree to merge with another party, they are not disqualified.
 2. **Presiding Officers:** A person elected as the Speaker or Chairman can resign from their party to maintain neutrality and can rejoin it after they leave the office without facing disqualification.
- **Deciding Authority:** The power to decide on disqualification rests with the **Presiding Officer** of the House (the Speaker in the Lok Sabha/Assemblies and the Chairman in the Rajya Sabha/Councils).

- **Judicial Review:** Originally, the law stated the Presiding Officer's decision was final and could not be challenged in court. However, in the **Kihoto Hollohan case (1992)**, the Supreme Court ruled that the Speaker acts as a tribunal, meaning their decision is subject to **judicial review** by High Courts and the Supreme Court.

Evolution of the Anti-Defection Law:

Pre-1985	<u>The Era of "Aaya Ram, Gaya Ram":</u> In the 1960s and 70s, Indian politics was plagued by frequent floor-crossing. The most famous instance occurred in 1967, when Haryana MLA Gaya Lal changed parties three times in a single day. This instability led to the fall of multiple state governments and created a culture of opportunism where legislators would jump ship for cabinet positions or other incentives.
1985	<u>52nd Amendment Act:</u> The Tenth Schedule of the Indian Constitution, also known as the Anti-Defection Law, was inserted by the 52nd Constitutional Amendment Act, 1985, to curb the growing menace of political defections & to provide a legal framework for disqualifying defectors.
1992	<u>Kihoto Hollohan Case:</u> This landmark judgment upheld the constitutional validity of the Tenth Schedule. Crucially, it declared that while the Speaker has the power to decide disqualification cases, their decision is not immune from judicial review. Courts can intervene in cases of <i>mala fide</i> intent or jurisdictional error.
2003	<u>The 91st Amendment (2003):</u> ● Removed the "Split" provision: Previously, a "split" by one-third of a party's members was protected. This was removed to prevent mass defections. ● Ministerial Limit: It capped the total number of ministers (including the PM/CM) at 15% of the total strength of the Lok Sabha or State Assembly. ● Holding Office: A member disqualified under the 10th Schedule cannot hold any remunerative political post or ministerial position until they are re-elected.
2020-2025	Keisham Meghachandra Singh v. Speaker, Manipur (2020) and the recent Padi Kaushik Reddy v. Telangana (2025) case, the Supreme Court directed Speakers to decide disqualification petitions within a "reasonable period," explicitly stating a three-month timeline.

What was need for introducing the Anti-Defection Law?

1. **Ensuring Political Stability:** Between the general elections of 1967 and 1971, nearly **50% of the 4,000 odd legislators** in Central and State assemblies defected. State governments were collapsing like houses of cards. When a government is constantly worried about losing its majority to a rival party's "offer," it focuses on survival rather than policy-making. By making it difficult for individuals to defect without losing their seats, the law ensures that the government can focus on long-term administration rather than constant survival tactics.
2. **To Curb the Influence of Money and Power:** Defections were rarely driven by ideology; they were driven by "**Horse Trading**" (Political Corruption). Legislators would defect in exchange for a Cabinet berth in the new government. Large sums of money being paid to "buy" the loyalty of independent and small-party candidates to tip the scales during a floor test.
3. **To Prevent the Breach of Electorate's Trust:** When a citizen votes for a candidate, they are often voting for the **party's manifesto and ideology**. Defection of a candidate effectively nullifies the mandate of the voters. The law was intended to ensure that a representative remains accountable to the platform they were elected on.
4. **Party Discipline and Cohesion:** The law gives legal teeth to the **Political Party** as an institution. Through the system of "Whips," parties can ensure that their members vote as a unified block on crucial Bills. This prevents internal sabotage and ensures that the legislative agenda of the party in power can actually be implemented.
5. **Constitutional Legitimacy to Political Parties:** Until the Tenth Schedule was added, political parties had no formal mention in the Indian Constitution. The Anti-Defection Law provided **constitutional recognition** to political parties, acknowledging them as the fundamental units of Indian democracy.
6. **Saving of Taxpayer's Money:** Frequent defections and floor-crossings often led to mid-term elections. By preventing governments from collapsing every few months, the law helped save the enormous expenditure of conducting frequent elections and the cost of President's Rule (which often followed unstable assemblies).

What have been the concerns/issues raised against the Anti-Defection Law?

1. **Suppression of Legislative Dissent:**
 - Since every member *must* vote according to the party whip (under threat of disqualification), the outcome of most debates is a foregone conclusion. This reduces the significance of individual arguments and logical persuasion on the floor of the House.
 - It also creates a conflict of interest. A legislator may feel that a specific Bill (e.g. a controversial land acquisition law) is bad for their specific constituency, but they are legally forced to vote for it if their party commands it.
2. **Partisanship of the Speaker:**
 - **Lack of Neutrality:** Speakers usually belong to the ruling party and do not resign from their party upon taking office. This often leads to biased decisions where disqualification petitions against opposition members are fast-tracked, while those against members supporting the ruling party are delayed.
 - **Indefinite Delays:** The law originally set no timeline for the Speaker to decide. This has allowed Speakers to "sit on" petitions for years, effectively allowing defecting members to complete their terms without consequences.
3. **Wholesale Defection:** The law only punishes "retail" (individual) defection but incentivizes "wholesale" (mass) defection. Under the 91st Amendment, if **two-thirds** of a party's legislators defect together, it is labeled a "merger" and they face no penalty. Thus, despite the law, defections continue due to inducements and intimidation, with legislators often kept in "**resorts**" during political crises.

4. **Resignation over Defection:** Instead of voting against the whip, legislators simply **resign** from the House. This brings down the government's majority. Once the government falls, these members often contest by-elections on the ticket of the opposing party and return to the House as ministers. This bypasses the spirit of the law while following its letter.
5. **Lack of Intra-Party Democracy:** The law gives supreme power to the party leadership via the "Whip," it discourages internal democracy. Rank-and-file members are afraid to criticize the leadership or policy decisions within the party because an expulsion could end their career.

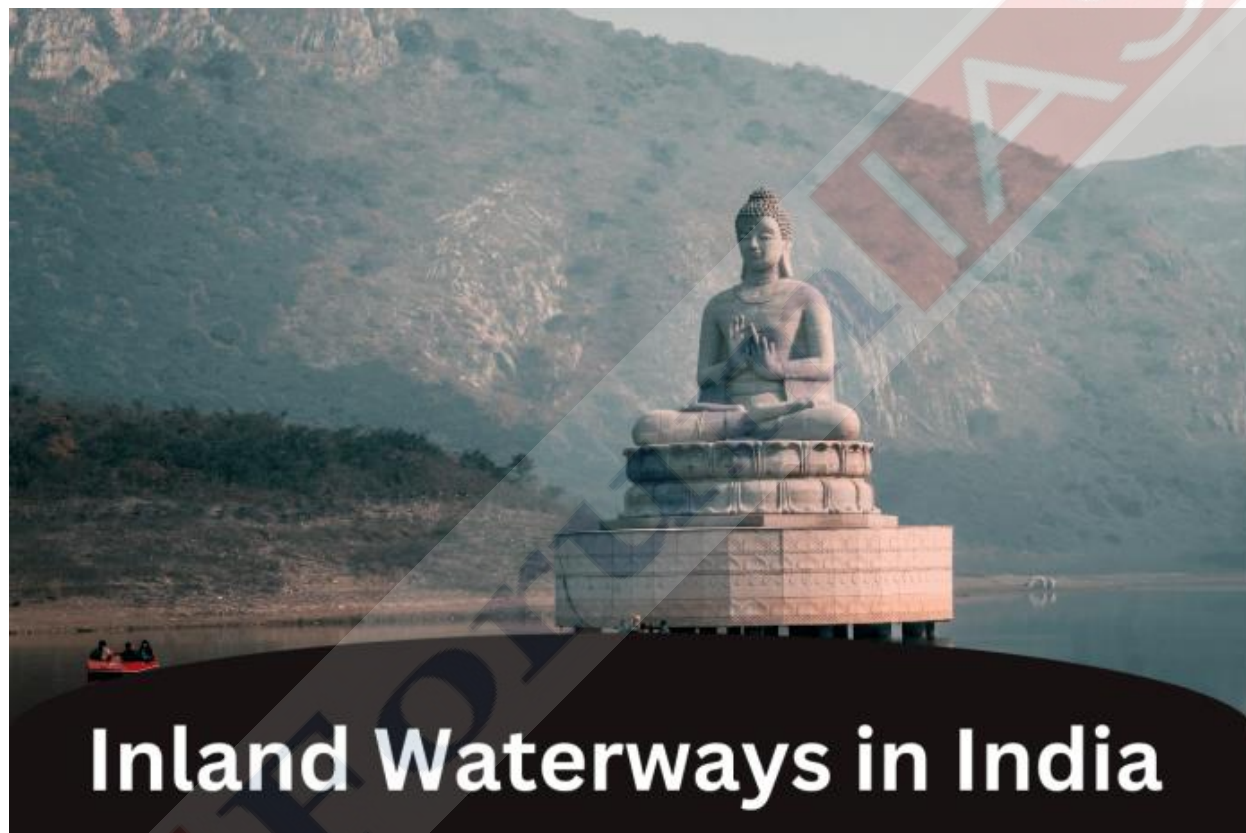
What are the reforms that should be introduced into the Anti-Defection Law?

1. **Neutral Decision-Making Authority:** The law gives power to disqualify a member to the Speaker of the Legislature. This should be replaced with:
 - a. **Election Commission:** Both the **Election Commission of India** and the **2nd Administrative Reforms Commission (ARC)** suggest that the President (for MP's) or Governor (for MLA's) should decide defection cases based on the **binding advice of the Election Commission**.
 - b. **Independent Tribunal:** In the *Keisham Meghachandra Singh case (2020)*, the Supreme Court suggested that Parliament should consider creating a **permanent independent tribunal** to decide these cases to ensure impartiality.
2. **Limiting the Scope of the "Whip":** To prevent the law from silencing legitimate dissent, the **Dinesh Goswami Committee** recommended:
 - a. **Use of Whip Only for Survival:** The "Whip" (and subsequent disqualification for defying it) should only apply to motions that affect the **survival of the government** for e.g. for No-Confidence Motions, Money Bills (Budgets), or Votes of Thanks.
 - b. **Freedom of Conscience:** On all other Bills (social, environmental, developmental), legislators should be free to vote according to their conscience or their constituents' interests without fear of losing their seat.
3. **The Merger Loophole:** The current rule allows 2/3rd of a party to merge with another. This simply legalizes mass horse-trading. This can be prevented by:
 - a. **Raising the Bar:** Raising the threshold to **3/4ths** or even removing the "merger" exception entirely.
 - b. **Resign and Re-elect:** The Law Commission recommended that any person who defects—whether individually or as part of a group—must **immediately resign** and cannot hold any ministerial post until they win a by-election.
4. **Ban on Ministerial Posts:** While the 91st Amendment bars defectors from being ministers until they are re-elected, politicians use the "Resignation Route" to bypass this. To prevent this, any legislator who resigns during the term of a House should be barred from contesting by-elections or holding a remunerative political post for the **remainder of that House's term** (e.g., up to 5 years).
5. **Enforce Strict Timelines for Decisions:** Introduce a **statutory deadline** for Speakers to decide on disqualification petitions, with **90 days** being a commonly suggested benchmark. If a decision is not made within this period, the defecting member should automatically face disqualification.
6. **Strengthen Deterrence through Severe Penalties:** To make defection a financially and politically unattractive proposition, stricter punishments are needed:
 - a. **Six-Year Disqualification:** Bar a disqualified defector from contesting any election for **six years** (a full electoral cycle), ensuring they cannot simply switch sides as a short-term career move.

- b. **Loss of Pension:** Newer proposals, inspired by recent state-level actions in Himachal Pradesh, suggest that legislators disqualified under the anti-defection law should also **forfeit their right to a legislative pension.**

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Inland Waterways in India – Explained Pointwise



India possesses an extensive network of inland waterways in the form of rivers, canals, backwaters, and creeks. These routes offer a cost-effective and environmentally sustainable way to move freight, as they use fuel efficiently and produce fewer emissions. They require minimal land, safely carry bulk/over-dimensional cargo, and maintain high safety standards across operations. Recognising this potential, the **Union Budget 2026-27** announces the operationalisation of **20 new National Waterways over the next five years** and introduces a **Coastal Cargo Promotion Scheme** that seeks to shift cargo from road and rail to water transport. This policy push is intended to increase the combined share of inland waterways and coastal shipping from **6% to 12%** by 2047. In this article we will look at the status of Inland waterways sector in India. We will look at its advantages and the initiatives taken for its development. We will delve into the challenges that the sector faces with the way ahead for the sector.

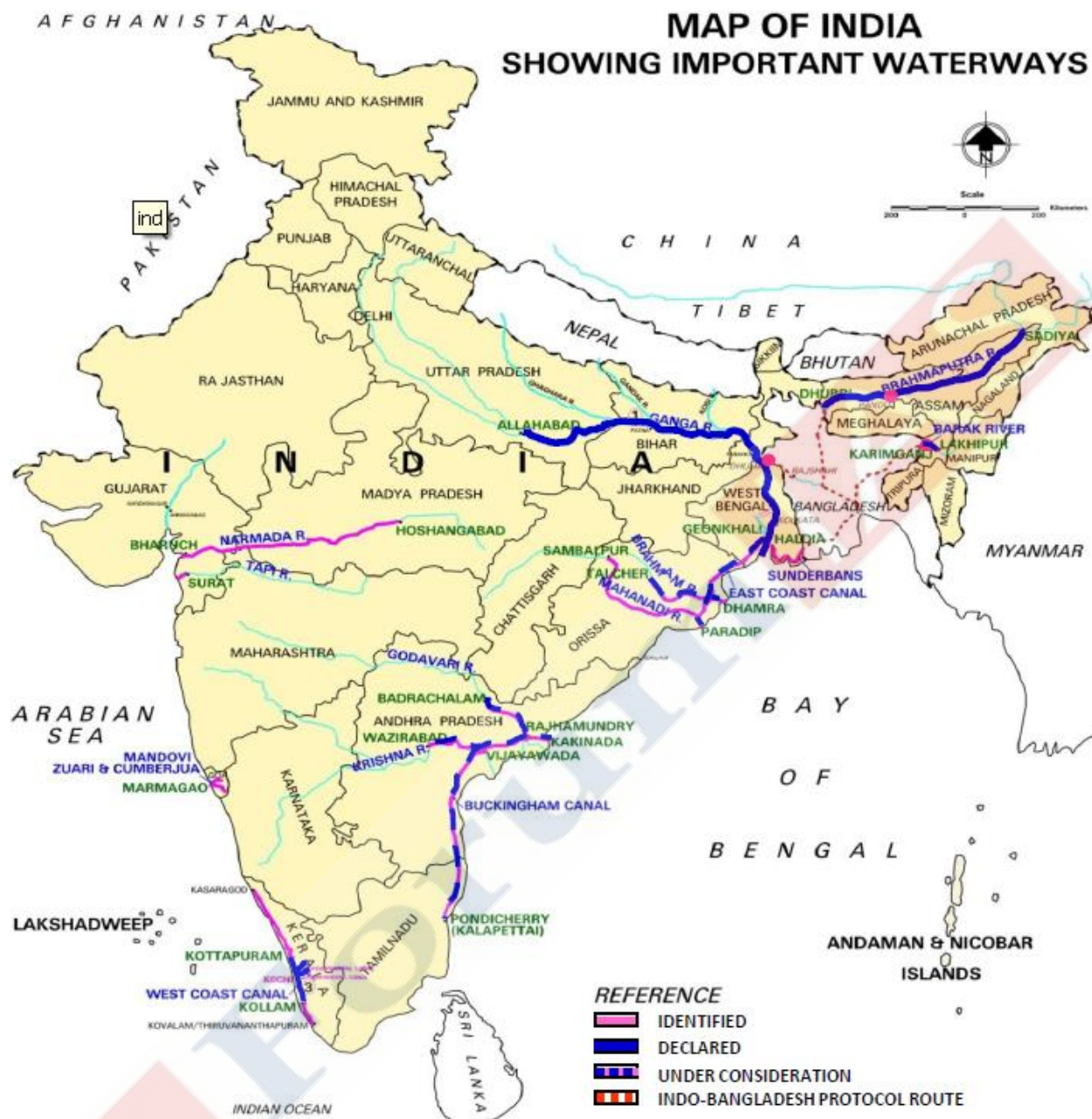
What is Inland Water Transport (IWT)? What is the status of Inland waterways in India?

- **Inland Waterways:** Inland waterways are navigable water channels within a country *that are not part of the sea*. These include *rivers, canals, lakes, lagoons*, and certain *river estuaries*. They are suitable for navigation due to natural or man-made features and allow vessels carrying at least 50 tonnes under normal operating conditions. They support commercial transport that ranges from natural river routes to completely engineered channels, and are commonly classified into three main types:
 1. **Open River Waterways** are natural rivers where vessels operate in a largely free-flowing channel, with limited improvements made to maintain sufficient depth for movement.
 2. **Canalised Waterways** are rivers that have been modified using structures such as locks and dams, which divide the river into calmer sections and provide more reliable water levels for transport.
 3. **Canals** are man-made waterways built specifically to carry vessels, often to avoid natural barriers or to connect different rivers and lakes, offering fully controlled conditions for inland water transport.
- **Inland Waterways in India:**

Operational NWs in India (as of March, 2026)

S. No.	State(s)	NW No.	Limits of NW
1	Andhra Pradesh	NW-4	Krishna-Godavari River Systems
2	Assam	NW-2	Brahmaputra River (Dhubri-Sadiya)
3		NW-16	Barak River
4		NW-31	Dhansiri / Chathe
5		NW-57	Kopili River
6	Bihar	NW-94	Sone River
7	Goa	NW-68	Mandovi River
8		NW-27	Cumberjua River
9		NW-111	Zuari River
10	Gujarat	NW-48	Jawai-Luni-Rann of Kutch River
11		NW-73	Narmada River
12		NW-87	Sabarmati River
13		NW-100	Tapi River
14	Kerala	NW-3	West Coast Canal

15		NW-8	Alappuzha-Changanassery Canal
16		NW-9	Alappuzha-Kottayam-Athirampuzha Canal
17	Maharashtra	NW-10	Amba River
18		NW-53	Kalyan-Thane-Mumbai Waterway, Vasai Creek and Ulhas River
19		NW-83	Rajpuri Creek
20		NW-85	Revadanda Creek-Kundalika River System
21		NW-91	Shastri River-Jaigad Creek System
22		NW-5	East Coast Canal and Matai River/Brahmani-Kharsua-Dhamra Rivers/Mahanadi Delta Rivers
23	Odisha	NW-14	Baitarani River
24		NW-23	Budha Balanga
25		NW-64	Mahanadi River
26	Uttar Pradesh	NW-110	Yamuna River
27		NW-40	Ghaghra River
28	Uttar Pradesh, Bihar, Jharkhand, West Bengal	NW-1	Ganga-Bhagirathi-Hooghly River System (Haldia-Allahabad)
29	West Bengal	NW-44	Ichamati River
30		NW-47	Jalangi River
31		NW-86	Rupnarayan River
32		NW-97	Sundarbans Waterway



Source- Wikipedia

- According to the **Economic Survey 2025-26**, as of November 2025, **cargo operations are functional on 29 National Waterways**, **cruise operations on 15 National Waterways**, and **passenger services on 23 National Waterways**. A total of **11 National Waterways support all three modes of transport**, namely cargo, cruise, and passenger movement, signifying strong multimodal integration.
- Passenger traffic** has also grown significantly, increasing from **1.61 crore in 2023-24 to 7.6 crore in 2024-25**. Cargo transportation on NWs reached **145.84 million metric tonnes in the financial year 2024-25**, and **198 MMT (till February 2026) in the financial year 2025-26**. The combined cargo handling capacity of major ports rose from **555 million metric tonnes per annum (MTPA) in FY 2013-14 to 1,681 MTPA in FY 2024-25**.

- The **turnaround time** for container vessels declined substantially from **41.76 hours in 2013-14** to **28.5 hours in 2024-25**.

What are the advantages of Inland Waterways in India?

1. **Lower Transportation Costs:** Inland water transport (IWT) is considerably cheaper than road and rail transport. It is reported to be 60% cheaper than road transport and 20-30% cheaper than rail.
2. **Fuel and energy efficiency:** It is a fuel and energy efficient medium of transportation as compared to the other modes of transport like rail and road. The **Integrated National Waterways Transportation Grid Study** states that **one litre of fuel** will move **24 tons** through **1km on road, 85km on rail and 105 km on inland water transport**.
3. **Environment Friendly:** IWT **emits 10 times less carbon dioxide per ton-kilometer** compared to road transport, contributing to lower greenhouse gas emissions.
4. **Less Land Requirement:** Utilization of waterways minimizes the need for extensive land acquisition. The land acquisition is often a **contentious and time-consuming process** associated with road and rail projects.
5. **Employment Generation:** The development of inland waterways is **labor-intensive**, creating jobs in various sectors such as river conservancy, vessel operation, terminal management, and tourism.
6. **Better connectivity:** IWT helps in creating seamless interconnectivity connecting hinterlands along **navigable river coasts** and **coastal routes**. Further, riverine routes are likely to play a crucial role in connecting the north-eastern states to the mainland.
7. **Tourism Development:** Inland waterways can boost tourism through initiatives like **river cruises**. This helps to enhance passenger movement and also promote cultural and heritage tourism along riverbanks.

What are the government initiatives for the development of Inland Waterways in India?

National Waterways Act, 2016	The National Waterways Act, 2016, declares 111 inland waterways as 'National Waterways (NWs)' across the country to stimulate shipping and navigation. The total length of these NWs is 20,187 km, and they are spread across 23 States and 4 Union Territories of India. As of March 2026, 32 National Waterways are operational, spanning 5,155 km in the country for cargo and passenger movement, and the number is proposed to increase to 52 in the next 5 years.
The Inland Waterways Authority of India Act, 1985	The Inland Waterways Authority of India Act, 1985 provides for the creation of a dedicated authority to regulate and develop inland waterways for shipping and navigation, along with related activities. Under this Act, the Inland Waterways Authority of India (IWAI) was established by the Central Government to develop and regulate inland waterways for shipping and navigation. The IWAI mainly works on developing and maintaining infrastructure for inland water transport (IWT) on national waterways.

Maritime India Vision 2030

Maritime India Vision 2030 (MIV 2030) is a **strategic roadmap** released by the Government of India to modernize and expand the maritime sector by 2030.

MIV 2030 – Key targets

Key Performance Indicator		Current (2020)	Target (2030)
1	Major Ports with >300 MTPA cargo handling capacity	-	3
2	% of Indian cargo transshipment handled by Indian ports	25%	>75%
3	% of cargo handled at Major Ports by PPP/ other operators	51%	>85%
4	Average vessel turnaround time (containers)	25 hours	<20 hours
5	Average container dwell time	55 hours	<40 hours
6	Average ship daily output (gross tonnage)	16,500	>30,000
7	Global ranking in ship building and ship repair	20+	Top 10
8	Global ranking in ship recycling	2	1
9	Annual cruise passengers	4,68,000	>15,00,00
10	% share of Indian seafarers across globe	12%	>20%
11	% share of renewable energy at Major Ports	<10%	>60%

Inland Water Waterways Authority of India (IWAI) aims to increase the modal share of freight movement through IWT from **2% to 5%** and traffic volume to more than **200 MMT by 2030 & 500 MMT by 2047** in line with the **Maritime India Vision 2030**.

Maritime Amrit Kaal Vision 2047

Maritime Amrit Kaal Vision 2047 is India's long-term strategic roadmap to transform its maritime sector by the year 2047.

The Amrit Kaal Vision 2047 Action Points have been defined across 11 key themes which are provided as below.

Lead The World In Safe, Sustainable & Green Maritime Sector	Promote Ocean, Coastal & River Cruise Sector	Enhance Modal Share of Coastal Shipping & Inland Water Transport	Promote Maritime Clusters
Provide Maritime Professional Services	Become a Global Player in Shipbuilding, Repair & Recycling	Develop World Class Education, Research & Training Facilities	Strengthen India's Maritime Presence
Develop World Class Next Generation Ports	Enhance Efficiency Through Technology & Innovation	Enhance India's Tonnage	

Jal Marg Vikas Project	The Jal Marg Vikas Project, along with Jal Marg Vikas Project-II (Arth Ganga), is being implemented to improve navigability on National Waterway-1 and to support the socio-economic development of communities along the Ganga River banks. <table border="1"> <thead> <tr> <th data-bbox="451 384 946 436">Jal Marg Vikas Project on NW-1</th><th data-bbox="946 384 1435 436">Jal Marg Vikas Project II (Arth Ganga)</th></tr> </thead> <tbody> <tr> <td data-bbox="451 436 946 892"> - The project aims to increase the capacity of NW-1 along the Varanasi-Haldia stretch of the Ganga-Bhagirathi-Hooghly river system. - The project is supported by technical and financial assistance from the World Bank. - Its objective is to improve navigability on NW-1. This is being achieved through fairway development to maintain an assured water depth of 2.2 to 3.0 metres for at least 330 days a year. This allows the movement of larger vessels with a capacity of 1,500 to 2,000 DWT. - The project also includes the development of supporting infrastructure. This covers multimodal terminals, jetties, navigational locks, barrages, channel marking systems, and other logistics and communication facilities. - A ₹5,061.15 crore project is underway for National Waterway-1 (NW-1), covering a 1,390 km stretch from Varanasi to Haldia, and is targeted for completion by 30 June 2026. - Cargo movement on NW-1 has grown by 220%, increasing from 5.05 MMT in 2014-15 to 16.38 MMT in 2024-25. </td><td data-bbox="946 436 1435 892"> - ARTH GANGA (JMVP-II) has been planned and is being implemented as a sub-component of the Jal Marg Vikas Project (JMVP). - Its objective is to support socio-economic development along the banks of the Ganga. - The programme focuses on inclusive growth and aims to improve livelihoods of communities living along the river. - It seeks to link people's participation and economic activities with the rejuvenation of the Ganga. - Under JMVP-II, the programme provides simple logistics solutions to small farmers, fishery units, unorganised producers, horticulture florists, and artisans reach nearby markets. - This is expected to enhance economic activity in the region and generate significant employment opportunities. - As of April 2026, 66 community jetties have been developed along the river and are operational, facilitating local trade and serving approximately 1 lakh users daily. </td></tr> </tbody> </table> Source: PIB	Jal Marg Vikas Project on NW-1	Jal Marg Vikas Project II (Arth Ganga)	- The project aims to increase the capacity of NW-1 along the Varanasi-Haldia stretch of the Ganga-Bhagirathi-Hooghly river system. - The project is supported by technical and financial assistance from the World Bank. - Its objective is to improve navigability on NW-1. This is being achieved through fairway development to maintain an assured water depth of 2.2 to 3.0 metres for at least 330 days a year. This allows the movement of larger vessels with a capacity of 1,500 to 2,000 DWT. - The project also includes the development of supporting infrastructure. This covers multimodal terminals, jetties, navigational locks, barrages, channel marking systems, and other logistics and communication facilities. - A ₹5,061.15 crore project is underway for National Waterway-1 (NW-1), covering a 1,390 km stretch from Varanasi to Haldia, and is targeted for completion by 30 June 2026. - Cargo movement on NW-1 has grown by 220%, increasing from 5.05 MMT in 2014-15 to 16.38 MMT in 2024-25.	- ARTH GANGA (JMVP-II) has been planned and is being implemented as a sub-component of the Jal Marg Vikas Project (JMVP). - Its objective is to support socio-economic development along the banks of the Ganga. - The programme focuses on inclusive growth and aims to improve livelihoods of communities living along the river. - It seeks to link people's participation and economic activities with the rejuvenation of the Ganga. - Under JMVP-II, the programme provides simple logistics solutions to small farmers, fishery units, unorganised producers, horticulture florists, and artisans reach nearby markets. - This is expected to enhance economic activity in the region and generate significant employment opportunities. - As of April 2026, 66 community jetties have been developed along the river and are operational, facilitating local trade and serving approximately 1 lakh users daily.
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Sagarmala Programme	It aims at enhancing multi-modal connectivity including rail, inland water, coastal and road services.				
Interlinking of Rivers Programme	The project is expected to offer potential benefits to the inland waterways transport sector through navigation.				
Jalvahak Scheme	Jalvahak scheme promotes a strategic transition of cargo to inland waterways by providing incentives to vessel operators and supporting scheduled cargo services on NW-1, NW-2 and NW-16 via the Indo-Bangladesh Protocol (IBP) route. Under the scheme, up to 35% of the actual operating cost of a waterway journey is reimbursed. The scheme is expected to shift about 800 million tonne kilometres of cargo to inland waterways, which is nearly 17% of the total cargo movement currently carried on National Waterways.				

The Inland Vessels Act, 2021	It brings uniform rules for inland waterways across the country. It ensures safe navigation and protects life and cargo. It also reduces pollution from the use of inland vessels. The Act promotes transparent and accountable administration of inland water transport.
The Coastal Shipping Act, 2025	The Coastal Shipping Act, 2025 states that the Central Government publishes a National Coastal and Inland Shipping Strategic Plan within two years of the Act's commencement, and updates it every two years. The Strategic Plan identifies coastal shipping routes, including those that overlap with inland waterways, and specifies the operational improvements needed to make coastal maritime transport more cost-efficient for goods and passengers.
Harit Nauka Inland Vessels Green Transition Guidelines	Harit Nauka Inland Vessels Green Transition Guidelines provide a strategic framework for making inland water transport cleaner, more efficient, and future-ready in line with India's National Maritime Vision.
River Cruise Tourism Roadmap, 2047	The River Cruise Tourism Roadmap 2047 provides a structured framework to promote river cruise tourism in India. It focuses on four key pillars: infrastructure development, integration, accessibility, and supportive policy measures.
Digital Initiatives	CAR-D (Cargo Data) is a web-based portal developed by the Inland Waterways Authority of India (IWAI) to collect, analyse, and share data on cargo and cruise movement on National Waterways. Least Available Depth Information System (LADIS) has been introduced to share information on the minimum available water depth in navigation channels on selected National Waterways. An assured water depth is essential for the smooth movement of vessels. River Information Services (RIS) is an integrated digital system designed to improve safety, efficiency, and traffic management on inland waterways. It enables real-time vessel tracking, monitors waterway and navigation conditions, and provides updates on weather and water levels. It also supports communication between vessels and control centres. IWAI Vessel Tracker and PANI Portal together offer a digital solution for e-navigation on inland waterways. They are available as a web portal and a mobile application. The system provides updated navigation routes, water depth information, and real-time vessel tracking to support safe and efficient movement.

What are the key challenges facing Inland Waterways in India?

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IWT is the most economical mode of transportation, especially for bulk cargo like coal, iron ore, cement, food grains and fertilizer. However presently the IWT sector remains underutilized at a share of 2% in India's modal mix due to the following challenges:

1. **Infrastructural/Technical challenges:** There is challenge of Inadequate depths in Indian rivers, especially **northern rivers which suffer from high siltation**. This necessitates extensive dredging of Indian rivers.
2. **Lack of Adequate Terminals:** There is a **shortage of modern terminals** and **maintenance, repair, and overhaul** (MRO) facilities for vessels, impacting their operational efficiency.
3. **Environmental Concerns:** Dredging activities necessary for maintaining navigability can lead to environmental degradation (like **riverbed damage, aquatic species damage**) and community resistance due to fears of displacement or ecological harm.
4. **Technical Limitations:** **Low vertical clearances from bridges** obstruct the passage of bigger vessels and the lack of **Night Navigation Facilities** such as **Differential Global Positioning Systems** (DGPS) hampers safe navigation at night.
5. **Institutional and Regulatory challenges:** The IWT sector is often burdened by regulatory complexities and overlapping jurisdictions among various government agencies. **For ex-** Multiple authorities including the Central Inland Water Corporation Limited (CIWTC Ltd), port authorities and state governments.
6. **Lack of funds:** Dredging as well as infrastructure for IWT requires huge investments. However, both public and private funding in the sector is low.

What should be the Way Forward for the development of Inland Waterways in India?

NITI Aayog has recommended the following measures for the development of Inland Waterways in India:

1. **Streamline the governance of inland waterways:** NITI Aayog recommends streamlining the regulatory structure and bringing an overarching body to oversee Inland Water Transport.
2. **Develop measures for year-round navigation:** Efforts should be made to develop deeper stretches of the river, i.e., at least 2.5 m to 3 m to achieve year-around navigation. Further the adequate maintenance of rivers, including continuous dredging to maintain adequate water depth for servicing shipping lines should be ensured.
3. **Ease restrictions on river-sea movement:** Utilizing a single vessel for both inland and coastal waters, lowers transport costs and minimizes handling. The **state authorities** should **draw up coordinates for inland vessel limits under the Inland Vessel Act** for their coastal waters.
4. **Creation of Inland Waterways transport hub in the North East:** State governments should commence work on dredging and channel stabilization to **create about 20 new ports in the Brahmaputra and Barak rivers**. The protocol for Inland Waterways between Bangladesh and India should be extended for at least 10 years to reduce uncertainty.
5. **Strengthen public-private partnership:** Private players can undertake terminal development, cargo and passenger handling, and building low-draft vessels and related repair facilities.
6. **Increasing economic activities along the Inland waterways:** **PM Mitra parks, Mega food parks,** should be located along the inland waterways route to encourage use of National Waterways (NWs).

Conclusion: India's inland waterways journey signifies an evident shift in how the country views its rivers, not merely as natural assets but as active instruments of growth, sustainability, and inclusion. By addressing the challenges & providing supportive policies, we can collectively shape a future where India's inland waterways emerge as prevailing passageways of economic vitality, ecological balance, and shared national progress.

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UPSC Syllabus- GS 3- Infrastructure

India's Fisheries Sector – Significance & Challenges – Explained Pointwise

India ranks as the world's second-largest fish-producing nation, accounting for approximately **8%** of global output. The fisheries sector constitutes a vital component of national food security, employment generation, and income enhancement, particularly across coastal and rural economies. Reflecting its growing structural significance, fisheries account for nearly **7.43%** of Agricultural Gross Value Added (GVA), the highest share among the agriculture and allied sectors. In this regard, let us understand the significance of the fisheries sector & the challenges that it is presently facing, as well as the various policy intervention provided to promote its growth.



Source: Benison Media

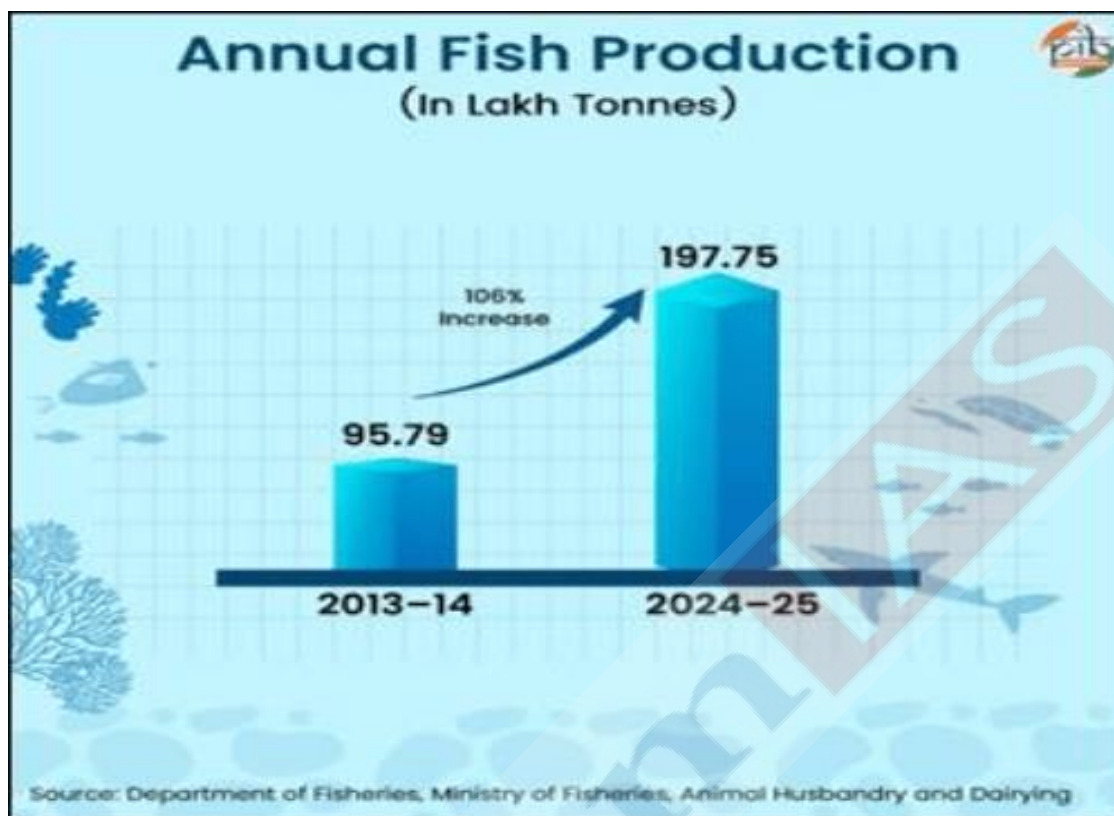
What is meant by the fisheries sector?

- The **fisheries sector** is a vital part of the global economy and food system. It involves the **harvesting, processing, distribution, and management of fish and other aquatic organisms** such as crustaceans (shrimp, crabs), mollusks (oysters, clams), and aquatic plants.
- Fisheries sector includes:

Marine Fisheries	Capture of fish from the seas and oceans: ○ Coastal Fisheries: Traditional and mechanized fishing within the territorial waters. ○ Deep-Sea Fishing: Operates in the Exclusive Economic Zone (EEZ) and high seas. ○ Mariculture: The farming of marine organisms in the open ocean or enclosed sections of the ocean.
Inland Fisheries	Largest contributor to India's total fish production (roughly 70%). ○ Capture Fisheries: Harvesting fish from open water bodies like rivers, canals, lakes, and reservoirs. ○ Aquaculture: Farming of fish and aquatic organisms under controlled conditions: ○ Freshwater Aquaculture: Farming in man-made ponds and tanks. ○ Brackishwater Aquaculture: Farming in water that has more salinity than freshwater but less than seawater.

What is the current status of the fisheries sector in India?

- India has one of the world's largest inland reservoir networks, spanning approximately **31.5 lakh hectares**, offering significant potential for expanding inland fisheries.
- India's extensive coastline of over **11,099 km** and an Exclusive Economic Zone (EEZ) of approximately **24 lakh square kilometres** sustain the livelihoods of more than **50 lakh members** of the fishing community across 13 maritime States and Union Territories.
- Backed by sustained interventions, total fish output more than doubled from **95.79 lakh tonnes** in FY 2013-14 to **197.75 lakh tonnes** in FY 2024-25, reflecting a **106%** increase over the period.



Source: PIB

Concurrently, seafood exports expanded significantly, reaching **₹62,408 crore** in **FY 2024-25**. Frozen shrimp remains the dominant export commodity, with the United States and China serving as key markets, highlighting the sector's expanding scale and growing global competitiveness.



Source: PIB

What is the significance of the fisheries sector and aquaculture?**1. Food & Nutrition Security:**

- Provides high-quality protein, omega-3 fatty acids, and essential micronutrients.
- Ensures affordable and accessible animal protein for rural and coastal populations.
- Enables year-round food availability through continuous production cycles.

2. Livelihoods & Employment:

- Supports over 30 million livelihoods directly and indirectly in farming, processing, transportation, and trade.
- Strengthens rural and coastal economies and provides supplementary income to farmers.
- Empowers women through their participation in post-harvest, processing, and marketing activities.

3. Economic Growth & Exports:

- Contributes about 1-2% to GDP and 7-8% to agricultural GVA.
- Major foreign exchange earner.

4. Resource Utilisation & Potential:

- Vast inland water resources (ponds, tanks, reservoirs, wetlands) remain underutilized.
- Huge potential for coastal and brackish-water aquaculture and mariculture of high-value species such as shrimp.

5. Poverty Alleviation & Equity:

- Provides supplementary income to small and marginal farmers.
- Offers livelihood options for landless and vulnerable communities through community-based or cage farming.

6. Environmental & Ecosystem Benefits:

- Supports aquatic biodiversity when managed sustainably.
- Promotes carbon sequestration and coastal resilience through mangrove-linked systems.
- Reduces pressure on wild fish stocks, aiding marine conservation.

What issues are being faced by the fisheries sector and aquaculture?

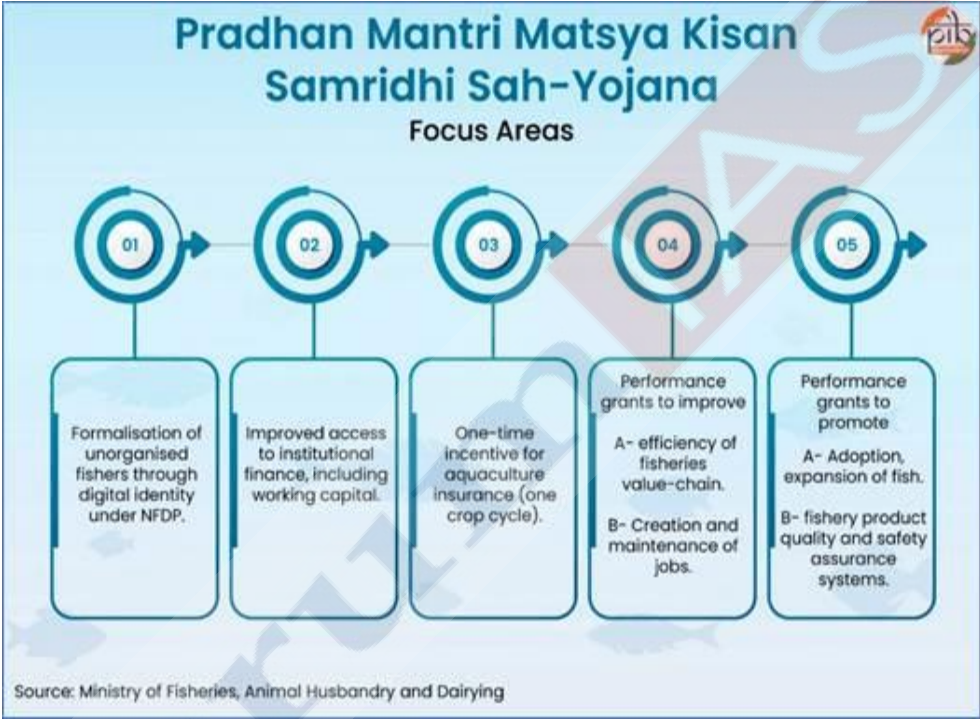
- 1. Overfishing and Coastal Depletion:** Scientific data indicates that 4.4% of India's fish stocks are already overfished, with another 8.2% under intense pressure. The situation is critical along the northwest coast, where **54.2% of fish stocks are overfished**. The government is investing nearly **200 times more** in extractive fishing than in restoring coastal ecosystems like mangroves and seagrass, which are vital breeding grounds for fish.
- 2. High Post-Harvest Losses:** Despite a 167% surge in inland aquaculture production to nearly 4 million tonnes, the sector suffers from high Fish Loss and Waste (FLW). Marine fish losses have climbed to over 10%, while dry fish losses are critically high at 37%. These losses stem from inadequate cold-chain capacity, poor handling practices, and unhygienic landing sites.
- 3. Market Dependency (Lack of Export Market Diversification):** India exports **95% of its shrimp to the US and European markets**, creating a dangerous vulnerability. Potential tariff actions, like those from the US, could deliver a **50% blow** to the shrimp sector.
- 4. Devastating Climate Change Impacts:**
 - Increased frequency of cyclones and unpredictable rainfall patterns disrupt fishing days and damage inland ponds. Rising sea surface temperatures are causing species like sardines and

mackerel to shift their distribution, moving deeper or further north, which makes them harder for traditional boats to reach.

- In 2025, unseasonal rains and cyclones in Palghar, Maharashtra, destroyed dried fish stocks worth an estimated **₹100 crore**, pushing over 100,000 fisherfolk to the brink. Despite being granted agricultural status, these fishing communities are often denied disaster relief packages available to farmers, leaving them with negligible compensation that fails to cover losses.
5. **Limited Value Addition:** India primarily exports raw frozen shrimp, missing out on the 30-40% additional value that competitors like Vietnam capture through processing. This is due to inadequate cold-chain capacity, inconsistent farm supply, and weak integration between farmers, processors, and exporters.
 6. **High Input Costs:** Feed constitutes nearly **70% of production costs**. Rising prices of fishmeal and ingredients make it difficult for small farmers to maintain profitability.
 7. **Global Competition:** India faces stiff competition from countries like Vietnam and Ecuador, which have more integrated cold chain systems and lower shipping tariffs.

What are the various government initiatives aimed at promoting the fisheries sector in India?

Blue Revolution	The Blue Revolution, launched in 2015, seeks to increase fish production and strengthen the fisheries value chain across inland and marine sectors by enhancing productivity, expanding infrastructure, and promoting modern practices. To build on these efforts and further advance post-harvest management, traceability, fisher welfare, and market linkages, the Government launched the Pradhan Mantri Matsya Sampada Yojana (PMMSY) in 2020 to accelerate the sector's transformation.
Pradhan Mantri Matsya Sampada Yojana (PMMSY)	The PMMSY seeks to enhance fish production and productivity, upgrade quality standards, promote technological modernisation, strengthen post-harvest infrastructure, and improve fisheries governance. The scheme prioritises technology-driven aquaculture systems that improve productivity while optimising resource use. It promotes high-density, water-efficient models such as Recirculatory Aquaculture Systems (RAS) and Bio-floc technology, which enhance output, maintain quality, enable nutrient recycling, and support environmentally sustainable fish farming.

Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana (PM-MKSSY)	The Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana (PM-MKSSY) is a Central Sector sub-scheme implemented under the umbrella of the PMMSY. The scheme facilitates the structural transformation of the fisheries sector by advancing formalisation, expanding insurance coverage, strengthening access to institutional finance, and promoting quality assurance and traceability across the fisheries value chain.  Source: Ministry of Fisheries, Animal Husbandry and Dairying
Kisan Credit Card for Fisheries	The Kisan Credit Card (KCC) scheme has become a pivotal instrument for advancing financial inclusion within India's agrarian economy. Structured to provide timely and affordable access to working capital, it enables farmers to finance the purchase of critical inputs and meet liquidity requirements for crop cultivation and allied activities. Since 2019, the scope of the scheme has been expanded to include animal husbandry, dairy, and fisheries. The Government has raised the lending limit under the KCC scheme for fisheries from Rs 2 lakh to Rs 5 lakh, thereby improving access to credit for fishers, farmers, processors, and other stakeholders.

Fisheries and Aquaculture Infrastructure Development Fund (FIDF)	FIDF was launched in 2018–19 to strengthen infrastructure across marine and inland fisheries and promote sustainable sectoral growth. The scheme offers a credit guarantee cover, helping fishers and entrepreneurs access much-needed credit with lower financial risk. It also provides an interest subvention of up to 3% per year.
Marine Fisheries Census 2025	The National Marine Fisheries Census (MFC) 2025, launched in 2025, represents a significant advancement toward fully digital, georeferenced data collection in India's fisheries sector.
Mission Amrit Sarovars	Under Mission Amrit Sarovar, the Government has facilitated the development of ~70,000 Amrit Sarovars, including 1,222 water bodies integrated with fisheries activities, thereby promoting fish culture, livelihood diversification, and the enhancement of aquatic ecosystems – thus, tapping the immense potential of inland fisheries in India.

What should be the way forward?

- 1. Deep Sea Fishing and EEZ Utilization:** With near-shore waters overexploited, the focus should be moved further out to sea. Investing in “Blue Economy” hubs in the Andaman & Nicobar and Lakshadweep Islands to serve as strategic bases for deep-sea fleets.
- 2. Prioritising Community-Led Models:** Fishermen Cooperative Societies and Fish Farmer Producer Organizations (FFPOs) will be given priority for deep-sea fishing operations. This empowers small-scale fishers by enabling them to access high-value resources like tuna.
- 3. Good Aquaculture Practices (GAqP):** Implementing traceability standards from “pond to plate.” This ensures that Indian seafood meets the stringent quality requirements of markets like the EU and USA, reducing the risk of export rejections.
- 4. Climate Resilience and Sustainability:**
 - **Species Diversification:** Moving beyond just shrimp and carp to high-value species like seaweed, tilapia, and sea bass which are more resilient to changing water temperatures.
 - **Integrated Multi-Trophic Aquaculture (IMTA):** Encouraging systems where the waste of one species (like fish) becomes the food for another (like seaweed or shellfish), creating a circular and eco-friendly farm model.

Conclusion: The fisheries sector is a critical contributor to India's economy, supporting the livelihoods of nearly three crore people, particularly among marginalised coastal and inland communities. If we are able to address the challenges faced by the sector then we will be able to move towards a more inclusive and resilient blue economy while contributing meaningfully to achieving **Sustainable Development Goal 14: Life Below Water** by sustainably managing fisheries and aquaculture.

UPSC GS-3: Agriculture

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Skill Development in India – Challenges & Initiatives – Explained Pointwise

India is at a pivotal demographic moment. With one of the youngest workforces in the world, the country has significant potential for higher productivity and growing consumer demand. Focusing on the potential of young population and realising the importance of skilling ecosystem, the **Union Budget 2026-27 positions skill development as a cross-sectoral priority.** Over the last decade, India has built one of the largest skilling ecosystems in the world. Between 2015 & 2025, India's flagship skilling programme, PM Kaushal Vikas Yojana, has trained & certified around 1.4cr candidates. Still, the employability outcomes remains uneven, and PLFS data show that wage gains from vocational training are modest & inconsistent, particularly in informal employment, where most workers are absorbed, offering limited recognition for certified skills & very less visible improvement in quality of life.



What is Skill Development?

- Skill development and upskilling play a pivotal role in enhancing the livelihoods of individuals and, by extension, the welfare of communities.
- This aspect of sustainable development is particularly crucial in rapidly developing economies like India, where a significant portion of the population still grapples with challenges such as unemployment and underemployment.

Skill Development Also Means...

Improved Confidence

Increased Income

High Employability

Better Quality of Life

Greater Career Progression

Sambhav

Source: Sambhav Foundation

What is the importance of skill development?

- 1. Enhancing Employability and Economic Independence:** Comprehensive skill development directly impacts employability. By equipping individuals with relevant, marketable skills, opens doors to new job opportunities and career paths. A report by the **National Skill Development Corporation (NSDC)** highlights that skill training increases the likelihood of employment by 15% to 25%. This rise in employability naturally translates into economic independence and improved living standards, crucial for individual and familial well-being.
- 2. Empowerment and Social Inclusion:** Skill development initiatives often target marginalised groups, including women and rural populations, thereby fostering social inclusion and empowerment. For instance, **UNESCO's** data indicates that vocational training programs have significantly increased women's participation in the workforce in developing countries, leading to their empowerment and, consequently, the upliftment of entire communities.
- 3. Fueling Economic Growth and Innovation:** A skilled workforce is the backbone of innovation and economic growth. According to a study by the **World Economic Forum**, economies that invest in their human capital tend to have higher growth rates. Skilled individuals contribute more effectively to the workforce, leading to increased productivity, which is a key driver of economic growth.
- 4. Contributing to Societal Advancement:** Skill development contributes to reducing poverty levels, as skilled individuals are more likely to secure better-paying jobs. The **International Labour Organization (ILO)** underscores this, stating that education and training are key determinants in breaking the cycle of poverty. Skilled populations are better positioned to contribute to their communities, not just economically but also in terms of social and civic engagement. This leads to healthier, more cohesive, and progressive societies.

What are the challenges or limitations in India's skill development programme?

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1. **Employability Gap:** The employability gap remains a major hurdle. Even though more youth are “certified,” they are not necessarily “job-ready.” According to the **India Skills Report 2025**, only about **54.8%** of Indian graduates are considered employable. Many training programs still focus on outdated curricula that don’t reflect current industry needs in AI, robotics, or the green economy.
2. **Low Placement Rates:** PMKVY 1.0, 2.0 and 3.0 had placement rates of roughly **18-23%**, dropping to about 10% in PMKVY 3.0, indicating limited translation of training into jobs.
3. **Misalignment with Market Demand (“Skill Mismatch”):** There is a persistent disconnect between the skills taught and the jobs available. While national policy identified sectors like **construction and logistics** as having over 60% of future demand, PMKVY allocated only 22.7% of training to these areas. Conversely, the **apparel sector alone received 28.4% of certifications**, despite not being a top-priority area and actually seeing a decline in employment. This supply-demand mismatch means candidates are trained for roles where few jobs exist.
4. **Limited Industry Participation:** For a skill programme to succeed, the “end-user” (the employer) must be involved in the design. But in India, only about **5% of enterprises** participate in formal skill development programs.
5. **Lack of “Skin in the Game”:** Many employers do not recognize government certifications, preferring their own internal training or private certifications (like those from Google or AWS) which they find more rigorous.
6. **Weak Apprenticeships:** While the **National Apprenticeship Promotion Scheme (NAPS)** has grown, it still accounts for a tiny fraction of the total workforce compared to countries like Germany.
7. **Failure of Sector Skill Councils (SSCs):** SSCs were created to act as industry-facing institutions that define standards, ensure relevance, and anchor employability. SSCs have not only failed to fulfill its mandate but have largely limited themselves to standard creation.
8. **Social Perception:** Only about **4.1%** of India’s workforce has received formal vocational training, a stark contrast to countries like South Korea (96%) or Germany (75%) because traditional degrees are still seen as the only path to social mobility. Vocational courses are often viewed as a “last resort” for those who fail in mainstream academics.
9. **Rural Disconnect:** While 7.1% of urban youth receive formal training, the figure drops to just **3.9% in rural areas**. Training centers are often clustered in urban hubs, leaving rural youth to deal with long travel times and high opportunity costs. Advanced training in AI and data analytics is largely concentrated in Tier-1 metros.
10. **Gender Barriers:** While female employability (54%) has actually surpassed male employability in some sectors, women remain underrepresented in high-end STEM and AI-intensive roles due to mobility constraints and socio-cultural barriers. Women face additional hurdles including limited mobility, lack of childcare at centers, and societal restrictions, leading to lower participation in high-growth technical trades.
11. **Fragmented Ecosystem:** The entire skill development ecosystem in India is fragmented: training is delivered by one entity, assessment by another, certification by SSCs, and placement by someone else. This fragmentation has eroded trust & diffuses the responsibility without consequences.

What are the various initiatives for skill development of the labour force in India?

Skill India Mission

- Skill India Mission (SIM), launched in 2015, provides skill, re-skill, and up-skill training through an extensive network of skill development centres under major schemes.
- The mission focuses on all sections of the society across the country, and concentrate on enhancing the skills and employability of the working age population.
- Under this mission, following schemes are covered:
 1. Pradhan Mantri Kaushal Vikas Yojana (PMKVY)
 2. Jan Shikshan Sansthan (JSS),
 3. National Apprenticeship Promotion Scheme (NAPS),
 4. Craftsman Training Scheme (CTS) in Industrial Training Institutes (ITIs)



Source: PIB

Pradhan Mantri Kaushal Vikas Yojana 4.0 (PMKVY 4.0)	● Provides short-term training, reskilling, and upskilling. ● Introduces 400+ new courses in emerging technologies, including AI, 5G, cybersecurity, green hydrogen, and drone technology. ● Promotes on-the-job training and recognition of prior learning to equip workers with globally recognized skills. ● Aligns with other government initiatives such as PM Vishwakarma, PM Surya Ghar Muft Bijli Yojana, National Green Hydrogen Mission, and NAL JAL Mitra, enabling cross-sector skill impact. ● Target Beneficiaries: Individuals aged 15–59 years.
Pradhan Mantri National Apprenticeship Promotion Scheme (PM-NAPS)	● Aims to expand apprenticeship training across industries. ● Provides 25% of the stipend (up to Rs. 1,500 per apprentice per month) through Direct Benefit Transfer (DBT). ● Expands apprenticeship opportunities in AI, robotics, blockchain, green energy, and Industry 4.0. ● Focuses on small establishments, MSMEs, aspirational districts, and the North-East Region. ● Target Beneficiaries: Individuals aged 14–35 years.
Sector Skill Councils (SSCs)	● SSCs are industry-led, autonomous bodies that act as the primary link between the government's skilling policy and the actual requirements of the workforce. ● They were established under the National Skill Development Corporation (NSDC) to ensure that training isn't just happening in a vacuum but is directly aligned with what employers actually need. ● Core functions: Setting Standards: They create National Occupational Standards (NOS) and Qualification Packs (QP). Assessment and Certification: They conduct exams and practical tests to certify that a trainee has actually mastered the required skills. Labour Market Information (LMIS): They track sector-specific data to predict which jobs will be in demand over the next 5 years, helping the government decide where to allocate funds. Train the Trainer (ToT): To ensure quality at the grassroots, SSCs train and license the instructors who work at various training centers across the country.

Jan Shikshan Sansthan (JSS) Scheme	• A community-driven vocational training program aimed at women, rural youth, and economically weaker sections. • Provides low-cost, flexible skill development programs. • Linked with initiatives like PM JANMAN and Understanding of Lifelong Learning for All in Society (ULLAS) to ensure inclusive skilling. • Target Beneficiaries: Individuals aged 15-45 years.
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ITIs

- ITIs are the backbone of long-term vocational education in India.
- They have been set up with the objective to **ensure a steady flow of skilled personnel to the industry.**
- To further strengthen this ecosystem, **PM-SETU (Pradhan Mantri Skilling and Employability Transformation through Upgraded ITIs)** was launched in 2025 as a **Centrally Sponsored Scheme.**



Source: PIB

Orange Economy	To strengthen the talent pipeline in high-growth creative segments, the 2026-27 Budget emphasises setting up AVGC (Animation, Visual Effects, Gaming and Comics) Content Creator Labs in 15,000 secondary schools and 500 colleges. With the AVGC sector projected to require nearly 2 million professionals by 2030, this initiative aims to build early-stage creative capacity, enhance industry-aligned skills, and strengthen India's presence in global digital content production.
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What can be the way forward to improve skill development in India?

- 1. Focus on Outcomes (Not Degrees):** Shift from measuring inputs (e.g., enrollments) to outcomes (e.g., job placement, productivity gains). Introduce an annual **Skills and Employment Survey** to track real employability.
- 2. Mandatory Apprenticeships:** Transitioning from optional to mandatory apprenticeship-linked degrees (e.g., the **PM-NAPS** expansion). This ensures students spend 50% of their time on the shop floor or in an office rather than just a classroom.
- 3. Industry-integrated ITIs:** Mandate industry participation in curriculum design. Modernizing Industrial Training Institutes (ITIs) through Public-Private Partnerships (PPP) where companies like Tata, Maruti, or Google "adopt" centers to install the latest equipment.
- 4. Academic Credit Bank:** Under the **National Education Policy (NEP) 2020**, credits earned from a welding or coding certificate can now be transferred to a formal university degree. Embed vocational subjects as electives from Class 8 under NEP 2020, with credit transfer between academic and skill streams for seamless mobility.
- 5. Global Mobility:** Signing **Migration and Mobility Partnership Agreements (MMPAs)** with countries like Germany, Japan, and France to ensure Indian certifications are recognized globally.
- 6. Enforce Accountability:** India's skilling challenge is a failure of accountability, not of intent or government funding. Thus, focus on enforcing accountability in the institutions of the skilling ecosystem, especially in SSCs. Until SSCs are held accountable for employability, certification will remain symbolic rather than economic.
- 7. Emphasizing Sunrise Sectors:** Skilling efforts must pivot toward high-growth areas where the demand for labor exceeds supply for e.g. focusing on training 1.5 lakh caregivers for the healthcare sector and professionals for green mobility ensures India captures emerging global services markets.
- 8. Innovative Financing:** Utilizing public-private partnerships (PPP) and frameworks like the **India Skills Accelerator** (in collaboration with the World Economic Forum) to scale innovative skilling solutions.
- 9. Quality of Trainers:** Create a formal **"Vocational Educator Cadre"** with mandatory industry immersion and continuous professional development to bridge the gap between teaching and industry realities.

Conclusion: When skills are embedded in degrees, when industry is treated as co-owner, and when SSCs are made answerable for placement outcomes, skilling move from fragmented welfare intervention to a pillar of national economic empowerment. Thus, focus on making India's skilling ecosystem resilient & future-ready so that it can help in translating the country's demographic advantage into broad-based, sustainable growth.

UPSC GS-3: Indian Economy

Read More: [The Hindu](#), [PIB](#), [Sambhav Foundation](#)

Health Insurance – Significance & Challenges – Explained Pointwise

According to the latest NSS data of the 80th round on “**Household Social Consumption: Health**”, while the health insurance coverage has increased considerably compared to the 2017-18 (75th round), this has not translated into a significant rise in the utilisation of the hospital care. A greater proportion of people are going to the private hospital – which is a concerning trend. Universal Health Care (UHC), envisioned by the **Bhore Committee (1946)**, remains distant for India even after eight decades. While PMJAY and SHIPs (State Health Insurance Programmes) have expanded formal coverage to over 80% of the population, they raise questions about sustainability, equity, and the future of India’s public health system.



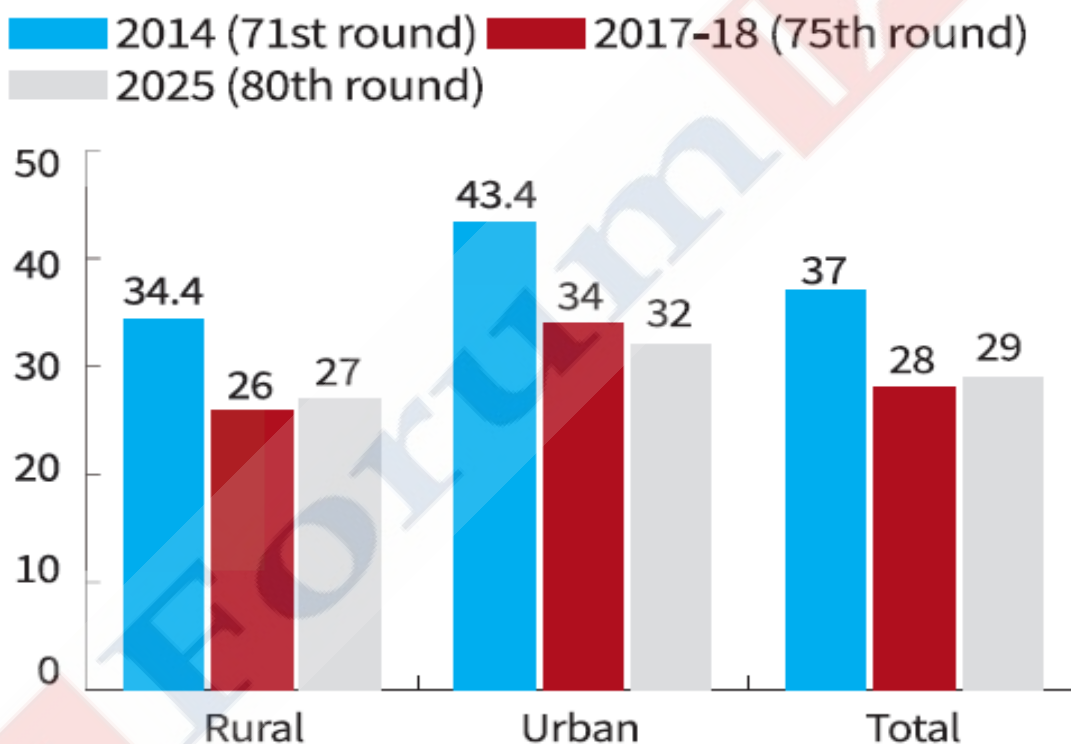
What is the Status of Health Insurance Coverage in India?

- **National coverage rate:** Currently, 47.4% of rural households & 44.3% of urban households are covered by some form of health insurance. This has been achieved by more than a 2.5 fold increase in coverage between 2017-18 & 2025 of government-financed health insurance (GFHI) schemes.
- **Ayushman Bharat-PM-JAY:** India’s largest public health insurance plan now covers 107 million families (over 40% of the population).
- **Private insurance:** Over 30% of insured individuals are covered by private plans, with premiums ranging from ₹5,000–₹20,000 per person per year.
- **Out of Pocket Expenditure (OOP Expenditure):**
 - Increased access to insurance coverage is failing to protect people from financial hardship. OOP expenditure on hospitalization has more than doubled in both rural & urban areas between 2017-18 & 2025.

- Average OOP expenditure (excluding childbirth) is Rs 31,250 in rural areas & Rs 34,259 in urban areas.
- Average hospitalization expenses in private hospitals have increased by 70% in rural areas & 80% in urban areas.
- **Hospitalization Rate:** While the insurance coverage has increased considerably, this has not translated into a significant rise in the utilization of hospital care. The hospitalization rate had decreased considerably.

Latest NSS data* reveal limited gains in hospital use and rising expenses despite a surge in insurance schemes

Table 1: Hospitalisation cases (per 1,000 persons)



Source: The Hindu

What is the Significance of health insurance?

1. **Preventing Catastrophic Expenditure (Out-of-Pocket Expenditure):** India historically has had one of the highest rates of **Out-of-Pocket (OoP)** healthcare spending in the world. Health expenses, particularly for hospitalization (secondary and tertiary care), are a leading cause of families falling into poverty ("**Medical Poverty**": About 7% of India's population is pushed into poverty annually due to out-of-pocket healthcare expenses). Health insurance, especially schemes like PMJAY, absorbs these unpredictable & high costs.
2. **Access to Quality Healthcare:** Insurance enables timely access to private and public healthcare services, allowing for cashless treatment and routine or emergency procedures. It allows middle- and lower-income families to access private multi-specialty hospitals that offer shorter wait times and

advanced medical technology – thus, it levels the playing field, ensuring that “quality” healthcare isn’t reserved only for the wealthy.

3. **Reducing the Burden on Public Infrastructure:** India spends only about **1.5-2% of its GDP** on public health – one of the lowest globally. Without insurance, citizens clog public hospitals for every minor ailment and major surgery, leading to long wait times, lack of beds, and doctor burnout. When a significant portion of the population uses insurance in private hospitals, it decongests public hospitals. This allows the government to redirect its limited budget toward **primary care** rather than tertiary care.
4. **Formalizing the Healthcare Sector:** Insurance requires detailed record-keeping, standardized billing, and adherence to treatment protocols. This forces hospitals to adopt better transparency and accountability, which is essential for improving the quality of care and curbing over-billing practices.
5. **Social Impact & Health Equity:** Health insurance schemes, especially government-led ones like Ayushman Bharat, improve inclusivity by covering low-income, rural, and vulnerable populations. They contribute to improved national productivity, lower mortality, enhanced wellbeing, and reduction of catastrophic health expenditures.

What are the various initiatives to expand the health insurance coverage?

1. **Ayushman Bharat – Pradhan Mantri Jan Arogya Yojana (PM-JAY):**
 - a. AB-PMJAY is one pillar of the larger **Ayushman Bharat scheme** launched in 2018, a health initiative designed to provide equitable health coverage, especially for rural & economically weaker sections.
 - b. PM-JAY offers ₹5 lakh annual cover per family for hospitalizations.
 - c. Covers secondary and tertiary care, both public and private hospitals nationwide.
 - d. Significant extension in 2025 to individuals aged 70 and above. Under this decision, all senior citizens aged 70 and above will receive health coverage, regardless of their income.
2. **State Health Insurance Programmes (SHIP):**
 - a. **Rajiv Aarogyasri** (AP, Telangana): Focused on BPL and serious illnesses.
 - b. **Arogya Karnataka:** Universal coverage aspirations with diagnostics, hospitalization.
 - c. **Mahatma Jyotiba Phule Jan Arogya Yojana** (Maharashtra): Provides cover up to ₹1.5 lakh per family.
 - d. **CMCHIS** (Tamil Nadu), **Bhamashah Swasthya Bima** (Rajasthan), and others provide cashless treatment and significant annual coverage.
3. **Health & Wellness Centres (HWCs):** Transformation of over 1.7 lakh sub-centres and PHCs into HWCs by 2024, offering primary healthcare and linking insurance benefits closer to communities.
4. **Ayushman Bharat Digital Mission (ABDM):** ABDM is creating unique digital health IDs (**ABHA (Ayushman Bharat Health Accounts)**) for every citizen. This infrastructure is vital for the future, as it will allow beneficiaries’ medical records and insurance claims to be linked digitally, making the entire process of enrollment and portability seamless.
5. **Key Regulatory Reforms in Health Insurance:** To streamline compliance, enhance transparency, and strengthen policyholder rights, IRDAI has introduced several regulatory reforms in the health insurance sector:
 - a. **Shortening of Moratorium Period:** Moratorium period in health insurance is a fixed timeframe after which insurance companies cannot deny claims on the grounds of non-disclosure and misrepresentation, except on grounds of established fraud. IRDAI **reduced the moratorium period from 8 years to 60 months (5 years) in 2024.**

- b. Standardized 30-day free-look period:** IRDAI introduced a standard 30-day free-look-period for policies with a term of one year or more. The free-look-period is the period given to a policyholder to assess and review the policy document.
 - c. Premium Refund on Mid-Term Cancellation:** In case of mid-term cancellation of the policy, insurers shall refund the premium or proportionate premium for the unexpired policy period.
- 6. GST Exemptions:** Removal of GST from insurance premiums (2025) to make insurance more affordable. GST exemptions on individual and family floater health insurance premiums have significantly lowered the cost for middle-class families.
- 7. 100% FDI:** Allowing 100% Foreign Direct Investment in insurance companies is bringing in global capital and technology to reach rural India.
- 8. NIRAMAYA Health Insurance Scheme:** Special affordable health insurance scheme for persons with disabilities, covering OPD and diagnostics. It provides affordable health insurance for PwD, offering up to Rs. 1 lakh coverage without pre-insurance medical test.
- 9. Mental Health Coverage:** Expansion of benefits under Ayushman Bharat and private schemes to include mental health services.

What are the Challenges related to health insurance in India?

- 1. High Out-of-Pocket (OoP) Expenditure:** Even with the growth of insurance, over 60% of total healthcare spending is still paid out-of-pocket by patients. This is due to the lack of coverage for Out-Patient Department (OPD) expenses which constitute the bulk of everyday medical costs. Most insurance only covers hospitalization. Even in public hospitals, patients incur significant expenses due to unavailability of medicines, diagnostic services, and high transport & other non-medical costs.
- 2. The "Missing Middle":** A vast segment of the Indian population is too wealthy to qualify for the highly subsidized PMJAY but too poor or informally employed to afford comprehensive private insurance. This group, estimated at around 30% of the population, often faces the greatest financial distress during a medical crisis.
- 3. Complex Exclusionary Clauses:** Private insurance policies are often highly complex, containing numerous and difficult-to-understand clauses, especially concerning Pre-Existing Diseases (PEDs). PEDs typically involve waiting periods of 2 to 4 years, meaning individuals with chronic conditions (like diabetes or hypertension) cannot access coverage immediately, defeating the purpose of buying insurance when they need it most.
- 4. Claim Denial and Disputes:** High rates of claim rejection or partial payment, particularly in the private sector, erode public trust. This often stems from ambiguity in policy wording, non-disclosure of health conditions by customers, or arbitrary interpretation of "medically necessary" treatment by insurers.
- 5. Privatisation of Healthcare & Profit-seeking Behaviour:** Health insurance in India promotes for-profit medicine. About two-thirds of the PM-JAY budget is spent on private, mainly profit oriented hospitals. India's healthcare system, however, is dominated by poorly-regulated profit seekers. Health insurance reinforces this bias rather than correcting it.
- 6. Misdirected Focus:** Health insurance also tilts the focus of the healthcare system towards hospitalisation, when investments in primary & outpatient care may be more urgent. Focus on strengthening the PHC would not only ensure accessible treatment but also reduce unnecessary hospital visits & their financial burden.
- 7. Lack of Awareness & Serious Utilisation Problem:** The combined coverage of PM-JAY & SHIP is estimated to be as high as 80% of the population. However, a large % of this population do not seem to know about these schemes or how to use them even if they are nominally enrolled. According to the

2022-23 Health Consumption Expenditure Survey – only 35% of insured hospital patients in that year were able to use their insurance. This is the main reason why there is no strong evidence linking the health insurance schemes with substantial reduction in OoP health expenditure.

8. **Discriminatory Treatment:** Targeted health insurance schemes create the issue of discrimination between insured & uninsured patients. Private hospitals prefer an uninsured patient because commercial charges for healthcare are usually higher for them – often much higher than the insurance reimbursement rates. Public hospitals, on the other hand, prefer insured patients because they get some money for their treatment. This creates the problem of discriminatory treatment & pressure to enroll for insurance on spot.
9. **Information Asymmetry and Fraud:** Both government and private schemes struggle with fraud and unethical practices. This includes excessive billing or unnecessary procedures by healthcare providers to maximize claim amounts, which, in turn, increases the overall cost of insurance for everyone. The NHA has recently recommended action against 3200 hospitals for fraudulent activities under PM-JAY.
10. **Regulatory Capacity:** While the Insurance Regulatory and Development Authority of India (IRDAI) is active, ensuring compliance across thousands of hospitals and hundreds of insurance products requires enormous regulatory bandwidth, especially in monitoring billing practices and claim settlement integrity.
11. **Impact on States' Budget:** Although GFHIs target socio-economically backward sections, many States have extended coverage to non-poor populations. The inclusion of non-poor households has increased the utilisation & placed a greater strain on States' budgets for e.g. in Haryana & WB, nearly 15% of their State health budgets are spent on GFHIs. This increased fiscal strain is also leading to delays in reimbursement to private providers.

What should be the Way forward?

1. Universal Health Coverage:

- Expand government schemes like Ayushman Bharat to cover the uninsured population (~400 million), especially focusing on outpatient care and chronic illnesses.
- **Bridge the "Missing Middle" Gap:** Encourage insurers to offer highly flexible, modular plans that allow the "missing middle" to buy specific coverage at a lower cost, with the option to add comprehensive coverage later.
- Increase public investment in primary and preventive healthcare, integrating insurance with wellness and early intervention programs.

2. Affordability & Product Innovation:

- Standardize insurance policies with transparent coverage and limits (e.g. Arogya Sanjeevani) to eliminate confusion and mis-selling.
- Develop plans tailored for seniors, women, and low-income groups, including wellness-linked benefits and cashless OPD coverage.

3. Mandatory Health Claims Exchange (HCX) Use:

The government must mandate the use of the HCX platform by all hospitals and insurers (public and private). This standardized digital exchange will drastically reduce claim processing time, minimize disputes, and reduce fraudulent billing by creating an audit trail.

4. Strengthened Regulatory Framework:

- IRDAI reforms to speed claim settlements, mandate cashless anywhere facilities, protect consumer rights, and regulate premium hikes.
- Introduce composite licenses allowing insurers to offer life and health insurance products seamlessly.

5. Increased Awareness & Literacy:

- Run public campaigns focused on the importance of insurance, especially in rural/underserved regions.
- Promote financial literacy, especially around claim processes, policy selection, and benefits.

6. Paperless and Aadhaar-Linked Claims: The goal should be for 100% cashless and paperless claim settlement for all enrolled patients, using the ABHA (Ayushman Bharat Health Account) ID for authentication and record access.**Conclusion:**

Health insurance is definitely an important pillar towards achieving UHC (Universal Healthcare), however, to truly achieve the UHC, the focus should be on not only overcoming the limitations of the existing health insurance programmes but also on investing in basic public healthcare infrastructure to deliver universal, comprehensive care.

UPSC GS-2: Social Security

Read More: [The Hindu](#), [The Hindu](#)