



7 PM COMPILATION

September, 2026

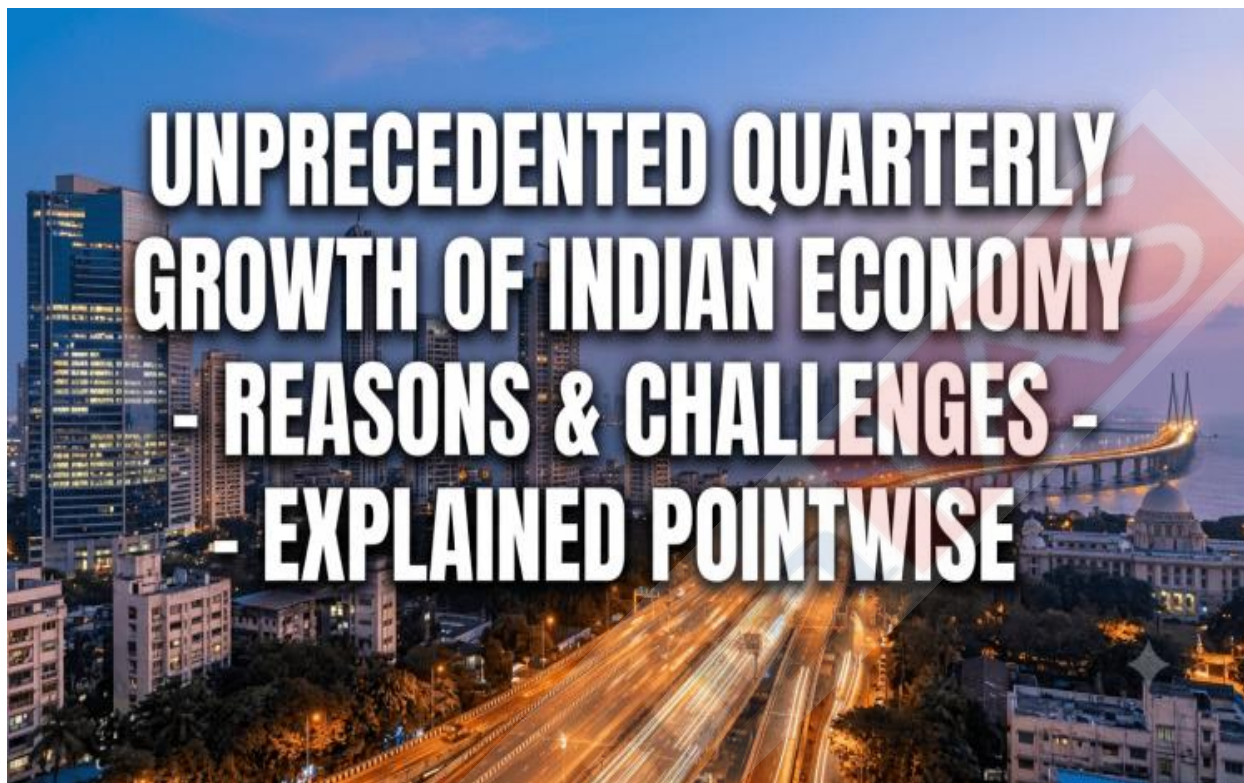
Features of 7 PM compilation

- ❖ 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
- ❖ Written in lucid language and point format
- ❖ Wide use of charts, diagrams and info graphics
- ❖ Best-in class coverage, critically acclaimed by aspirants
- ❖ Out of the box thinking for value edition
- ❖ Best cost-benefit ratio according to successful aspirants

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Unprecedented Quarterly Growth of Indian Economy – Reasons & Challenges – Explained Pointwise



India's real GDP grew **7.8% in Q1 FY2026-27**, surpassing the RBI's **7% forecast**, despite the West Asian conflict, oil-price shocks, supply-chain disruptions and global trade uncertainty. However, it also calls for examining the drivers of growth and structural challenges that could affect its sustainability in the coming years.

What are the major factors driving India's recent economic growth?

1. **Surge in Investment:** The most significant factor is the sharp increase in investment, with fixed capital formation growing nearly **12%**. This strong investment activity is occurring across both government and private sectors, particularly in areas like power, metal, and data centers.
2. **Strong private consumption:** Household consumption (which makes up nearly 60% of the economy) grew by **7.1% in Q1 FY2026-27**, up from 6.8% a year earlier, supported by resilient domestic demand and improving consumer spending, contributing significantly to overall 7.8% GDP growth.
3. **Higher government capital expenditure:** The government allocated **₹12.22 lakh crore for capital expenditure in FY2026-27**, up from ₹11.2 lakh crore in FY2025-26. This investment in infrastructure and productive assets is supporting demand, investment and long-term economic capacity.
4. **Strong manufacturing growth:** Manufacturing grew by **9.2% in Q1 FY2026-27**, supported by strong performance in electrical equipment (**27%**), transport equipment (**19.5%**), and electronics (**12.4%**), boosting overall economic activity.
5. **Robust services sector:** The tertiary sector continues to expand rapidly, led by financial services, real estate, travel, and Global Capability Centers (GCCs) setting up tech hubs in the country. The **services sector grew by 10.0% in Q1 FY2026-27**, up from 8.0% a year earlier. Financial, real estate, IT and

professional services recorded particularly strong **12.1% growth**, supporting India's overall GDP expansion.

6. **Resilient exports:** India's exports grew by **12%** in Q1 FY2026-27, supporting aggregate demand and cushioning global headwinds.
7. **Infrastructure and construction activity:** Sustained public capital expenditure boosted infrastructure and construction demand. In Q1 FY2026-27, the IIP for infrastructure/construction goods grew **7.2%**, while cement production rose **8.9%** and steel consumption **8.3%**, supporting overall economic growth.

What were the major challenges faced by the Indian economy during the first half of 2026?

1. **Geopolitical tensions and energy shock:** The conflict in West Asia pushed up crude oil prices. Since India imports over 80% of its crude oil, higher prices threatened inflation, the current account and economic growth.
2. **Uneven Monsoon Distribution:** Even with an overall normal monsoon headline, erratic rainfall distribution and El Niño aftermaths created regional water deficits across major agricultural belts.
3. **Capital outflows:** Global uncertainty and geopolitical tensions encouraged foreign investors to withdraw capital from Indian equities, putting additional pressure on the rupee and financial markets. Foreign investors withdrew nearly ₹2.74 lakh crore (\$29.28 billion) from Indian equities in H1 2026. This was a key factor behind the Sensex logging its worst first-half decline since the pandemic.
4. **Rupee depreciation:** The relentless FPI selling, combined with the high oil prices, pushed the rupee to record lows against the dollar, making it one of Asia's worst-performing major currencies, increasing the cost of imported oil, machinery and other inputs.
5. **Global trade uncertainties:** Protectionism, tariff-related disruptions and weak global demand posed risks to India's exports and manufacturing, particularly for sectors integrated into global value chains. India faced the steepest US tariffs in Asia (50% on many goods) hurting export-oriented sectors & especially the labor-intensive industries which account for nearly a quarter of India's exports to the US.
6. **External-sector vulnerability:** Higher energy import bills, currency depreciation and volatile capital flows could widen the current account deficit and increase external financing pressures.
7. **Balancing growth with fiscal consolidation:** The government had to simultaneously maintain high infrastructure spending and support economic activity while keeping the fiscal deficit on a sustainable path.

What are the various initiatives taken by the government to drive India's economic growth?

1. **Aggressive Public Capital Expenditure (Capex):** Direct government capital spending grew by **18.6%**, driving overall investment growth (Gross Fixed Capital Formation) up by 11.9%. Prioritizing mega-infrastructure projects (high-speed rail corridors, national highway expansion, and power-grid modernization) helped crowd in private sector investments.
2. **Manufacturing Expansion & PLI Schemes:** Targeted allocation under the **Production-Linked Incentive (PLI)** schemes for electronics, semiconductors, auto components, and advanced chemistry cells helped push manufacturing sector growth up to 9.2%.
3. **Household Demand Stimulus via Tax Relief:** Income-tax rationalisation made income up to ₹12 lakh tax-free under the new regime, while GST 2.0 lowered rates on essentials and consumer durables. Together, these measures raise disposable income and purchasing power, supporting consumption-led growth.
4. **Rural Economy & MSP Support:** To cushion rural purchasing power, the government raised Minimum Support Prices (MSPs) across major Kharif crops alongside targeted direct-benefit transfers

(DBT). This initiative, paired with favorable monsoon distribution, aided a 3.6% growth in the agriculture and allied sector.

5. **Digital Public Infrastructure:** UPI, Aadhaar and India Stack have lowered transaction costs and promoted financial inclusion. UPI now handles nearly **49% of global real-time payment volumes**, while India's digital economy contributes around **12–14% of GDP**.
6. **Export Promotion:** Despite US tariff pressures, India's exports remained resilient. Total exports grew 11.37% to \$232.73 billion in Q1 FY2026-27. The government is promoting FTAs, export diversification, Export Promotion Mission and logistics reforms to reduce market concentration.
7. **De-risking private investment:** An Infrastructure Risk Guarantee Fund was set up in the FY27 Budget to provide partial credit guarantees to lenders, aimed at encouraging private developers to commit capital during the riskier construction phase of large projects.

What are the major challenges that could affect the sustainability of India's high economic growth in the coming years?

1. **Low private investment:** Private investment remains below the level required for sustained high growth. The World Bank recommends raising India's investment rate from around 33.5% of GDP to 40% by 2035, requiring stronger credit access, FDI and business reforms.
2. **Employment generation:** India faces the challenge of converting rapid GDP growth into adequate, productive jobs. Around 12 million young people enter the labour market annually, making employment-intensive manufacturing, MSMEs, services and skilling crucial for sustaining inclusive growth.
3. **Low labour-force participation:** Despite improvement, India's LFPR fell to **54.6% in April-June 2026**, from 55.5% in the previous quarter. Female participation remains a concern, at **32.7% in June 2026**, limiting effective utilisation of India's demographic dividend.
4. **Global trade uncertainty:** Rising protectionism, tariff disputes and geopolitical fragmentation threaten India's export competitiveness and supply chains. In April 2026, India's merchandise trade deficit widened to **\$28.38 billion**, as imports surged amid global disruptions, highlighting external-sector vulnerabilities.
5. **Energy security:** India's crude-oil import dependence exceeded **90% in FY2025-26**, exposing the economy to global price and geopolitical shocks. Rising energy demand, import bills and supply disruptions can increase inflation, widen the current-account deficit and constrain sustainable growth.
6. **Climate change and environmental pressures:** Rising temperatures, water stress and extreme weather threaten productivity, agriculture and infrastructure. In 2024, extreme heat caused an estimated 250 million lost workdays, costing India \$1.3-1.8 billion (0.3-0.4% of GDP).

Conclusion: India's robust quarterly growth demonstrates strong economic resilience amid global turbulence. However, sustaining this momentum requires converting cyclical strength into **productivity-driven, employment-intensive and inclusive growth**, while strengthening private investment, human capital, energy security and resilience against external shocks.

UPSC GS-2: Indian Economy
Read More: [The Indian Express](#)

SCO (Shanghai Cooperation Organization) – Significance & Challenges – Explained Pointwise

The **SCO Summit 2026**, held recently in **Bishkek, Kyrgyzstan**, brought together leaders of its 10 member states to address regional security, terrorism, connectivity and economic cooperation, reaffirming the organisation's growing geopolitical significance.

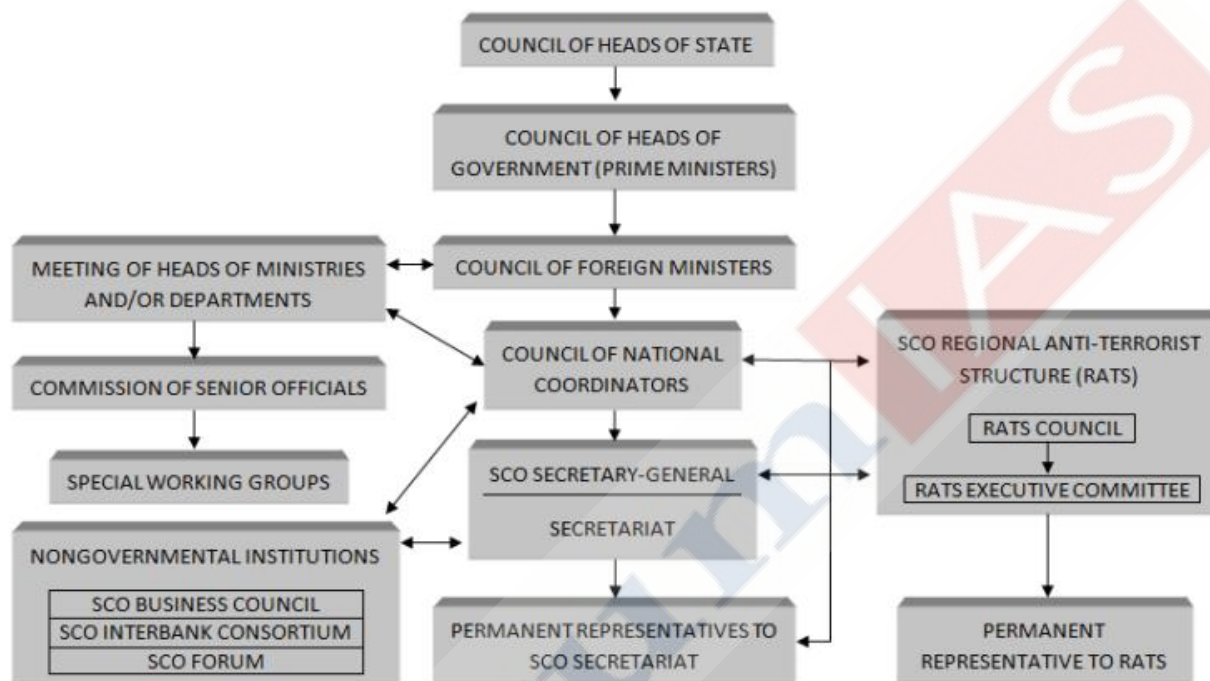
In this regard, let us understand the significance & challenges of the Shanghai Cooperation Organization (SCO).

What is SCO?

- **Shanghai Cooperation Organization (SCO)** is a Eurasian political, economic, international security, and defense organization. It was established on June 15, 2001, in Shanghai, China.
- SCO's roots lie in the **"Shanghai Five"** formed in 1996, consisting of **China, Russia, Kazakhstan, Kyrgyzstan, and Tajikistan**. This group was initially created to address security concerns and manage border issues after the dissolution of the Soviet Union. With the admission of **Uzbekistan** in 2001, the "Shanghai Five" was officially transformed into the SCO.
- At present, SCO comprise of 10 members: **People's Republic of China, Kazakhstan, Kyrgyzstan, Russia, and Tajikistan, Uzbekistan, India and Pakistan** (both joined in 2017), **Iran** (joined the in 2023), and **Belarus** (joined in 2024).
- **Secretariat:** Located in **Beijing, China**, handling administrative and diplomatic affairs.
- **RATS (Regional Anti-Terrorist Structure):** Located in **Tashkent, Uzbekistan**, focusing on intelligence sharing, counter-terrorism, and security coordination.

- **Head of State Council:** The supreme decision-making body that meets annually at the SCO Summit.
- **Guiding Principle:** The “Shanghai Spirit” – emphasizing mutual trust, mutual benefit, equality, consultation, and respect for cultural diversity.

THE STRUCTURE OF THE SHANGHAI COOPERATION ORGANISATION



Source: Wikipedia

- **26th SCO Summit (2026):** The 26th SCO Summit was held in Bishkek, Kyrgyzstan, concluded with the adoption of the **Bishkek Declaration**:

BISHKEK DECLARATION (2026): Key Takeaways & Outcomes:

- **Zero “Double Standards”:** The declaration explicitly condemns terrorism in all forms, stating that “double standards” in fighting terrorism are unacceptable.
- **Cross-Border Terrorism:** It calls on the international community to dismantle cross-border movement of terrorists, terror financing, radicalization, and safe havens.
- **Institutional Security Upgrade:** Leaders approved regulations establishing the **Universal Center for Countering Challenges and Threats to the Security of SCO Member States** to coordinate against cybercrime, organized crime, and drug trafficking.
- **Condemnation of Strikes on Iran:** The joint statement expressed deep concern over West Asian escalation and explicitly condemned military strikes on Iranian territory, calling for resolutions strictly via diplomatic means.
- **Position on Afghanistan:** Called for an independent, peaceful, and neutral Afghanistan with an inclusive government representing all ethno-political groups.

- **Multipolar World Order:** Reaffirmed commitment to an equitable multipolar international order, while clarifying that the SCO is **not** a military-political alliance targeted against third nations.
- **Anti-Narcotics Cooperation:** Regulations for the **SCO Anti-Narcotics Centre** were approved. Members agreed to strengthen cooperation against drug trafficking, narco-terrorism and synthetic drugs.
- **English Added as an SCO Official Language:** English was added as an official and working language of the SCO, alongside the existing languages.
- **AI governance:** The declaration also called for responsible use of artificial intelligence.

What is the SIGNIFICANCE of SCO?

1. Geopolitical and Strategic Influence:

- The SCO is the world's largest regional organization in terms of geographic scope and population. It covers approximately **80% of the Eurasian landmass** and about **40% of the world's population**.
- Its members range from nuclear powers (Russia, China, India, Pakistan, and now Iran) to resource-rich Central Asian states. This diversity of political systems, economies, and cultures makes it a unique platform for dialogue.

2. Economic and Connectivity Potential:

- SCO member states collectively account for about **30% of global GDP**. The inclusion of major economies like India and resource-rich nations like Iran further enhances its economic weight.
- With the inclusion of Iran, the SCO members control a significant percentage of the **world's oil (20%)** and **natural gas (44%)** reserves. The **SCO Energy Club** promotes cooperation between major energy producers and consumers within the bloc.
- SCO emphasizes promoting connectivity and infrastructure development across Eurasia. It aligns significantly with China's Belt and Road Initiative (BRI) (though India has concerns about BRI), promoting projects that enhance trade networks and transportation routes, such as the Central Asia-China Gas Pipeline.

3. Counter-Terrorism and Security:

A primary and highly successful initiative of the SCO is its focus on combating terrorism, separatism, and extremism. The **Regional Anti-Terrorist Structure (RATS)** based in Tashkent facilitates intelligence sharing and coordinated efforts against these threats, making it the primary security organization in Central Asia.

4. Regional Stability in Eurasia:

The SCO plays a crucial role in maintaining peace, security, and stability across the vast Eurasian region, particularly in Central Asia, which is strategically vital. While not always directly intervening, the SCO provides a platform for its members to discuss and coordinate approaches to regional issues, including the instability in Afghanistan.

5. Platform for Dialogue:

The SCO provides a crucial platform for high-level political and security dialogue among its diverse members, including those with bilateral tensions (e.g., India-China, India-Pakistan). This can help in de-escalating tensions and fostering understanding.

6. Consensus-Based Decision Making:

While dominated by China and Russia, the SCO's consensus-based decision-making process means that all members (including India) have a voice, even if it sometimes leads to slower action.

7. Quad v/s SCO:

While India's membership in the [Quadrilateral Security Dialogue \(Quad\)](#) with the US, Japan, and Australia is often viewed as a mechanism to balance China's growing influence, India simultaneously engages with China and Russia through the SCO. This reflects India's policy of **multi-**

alignment, enabling it to engage with both Western and non-Western groupings while preserving its **strategic autonomy**.

What are the LIMITATIONS/CHALLENGES of SCO?

1. Internal Conflicts and Bilateral Tensions:

- **India-China Border Disputes:** Ongoing border disputes and geopolitical tensions between India and China (e.g. the Ladakh standoff) frequently spill over into SCO discussions, making it difficult for the two major powers to fully cooperate on broader issues.
- **India-Pakistan Animosity:** The historical animosity and persistent issues between India and Pakistan create a challenging environment for consensus-building. India often expresses concerns about cross-border terrorism emanating from Pakistan, which Pakistan may try to deflect or downplay within the SCO forum.
- **Central Asian Border Disputes:** Conflicts and border disputes between Central Asian member states (e.g. Kyrgyzstan-Tajikistan) can also affect regional stability and divert the SCO's focus.
- **Lack of Conflict Resolution Mechanism:** The SCO lacks a formal and effective mechanism for resolving disputes between its member states, which means bilateral tensions often fester and can impede collective action.

2. Dominance of China and Russia: There is an inherent power imbalance within the organization, with China and Russia being the dominant players. This can lead to concerns among other members about disproportionate influence and decision-making, particularly from China due to its growing economic might e.g. The official languages of SCO are Russian & Chinese.

3. Selective Definitions of Terrorism: While security against the "Three Evils" (terrorism, separatism, extremism) is a founding principle, members apply double standards. India often criticizes state-sponsored cross-border terrorism, while other members protect regional proxies or disagree on specific terror group designations.

4. "Anti-Western" Perception: Despite its claims of being an open and non-aligned organization, the SCO is often perceived by Western countries as a grouping aimed at challenging the US-led global order and a potential counter to NATO. This perception can limit its ability to engage with Western partners on global issues.

5. BRI Concerns: China's Belt and Road Initiative (BRI), particularly the China-Pakistan Economic Corridor (CPEC) which passes through Pakistan-Occupied Kashmir (PoK), remains a major sovereignty concern for India. While all other SCO members endorse BRI, India remains isolated in its opposition, which limits its participation in some economic connectivity initiatives within the SCO framework.

6. Lack of a Free Trade Area: Despite discussions, the SCO does not have a comprehensive free trade agreement among its members. This limits its potential for deep economic integration compared to other blocs like ASEAN or the EU.

7. Limited Mandate: While expanding, the SCO's primary focus remains on security (the "three evils" of terrorism, separatism, extremism). This strong emphasis sometimes overshadows other crucial areas like economic and cultural cooperation, which could offer broader benefits.

8. Weak Security Structure: Unlike a military alliance such as NATO, the SCO has no binding security treaty. It has not been able to meaningfully mediate or stop conflicts involving its members, which is a major failure given its founding purpose of preventing conflict.

9. Gap Between Declarations and Implementation: The SCO frequently adopts ambitious declarations on counter-terrorism, connectivity and economic cooperation. However, weak institutional

mechanisms, divergent interests and limited enforcement capacity often hinder effective implementation, creating a persistent gap between commitments and outcomes.

What can be the WAY FORWARD?

1. **Strengthening Trust and Dialogue:** While the SCO is a multilateral forum, its most immediate utility for managing internal tensions often lies in providing opportunities for high-level bilateral meetings on its sidelines (e.g. India-China, India-Pakistan). These informal channels can be crucial for de-escalation and addressing specific grievances.
2. **Unified Stance on Terrorism – Zero Tolerance, No Double Standards:** The SCO must unequivocally condemn terrorism in all its forms and manifestations, without any justifications or differentiation between “good” and “bad” terrorists.
3. **Actionable intelligence sharing:** SCO needs to actively utilize the **Regional Anti-Terrorist Structure (RATS)** for intelligence sharing, capacity building, and joint exercises & also push for RATS to be more effective and less susceptible to political maneuvering by individual members. India should insist on cross-border terrorism being addressed without political shielding of state-sponsors.
4. **Strengthen Institutional Mechanisms:** The SCO should strengthen its Secretariat, establish effective monitoring and implementation mechanisms, set measurable targets, and improve coordination among member states to ensure timely implementation of decisions and commitments.
5. **Deepening Economic and Connectivity Initiatives:**
 - **Establishing the SCO Development Bank:** Establishing SCO Development Bank is often been cited as a vital step for financial independence and infrastructure financing. It would help members reduce reliance on Western financial systems and fund regional projects in transport, energy, and digital infrastructure.
 - **Focus on Regional Connectivity:** Respect territorial sovereignty on infrastructure initiatives (addressing concerns like India’s over CPEC). Fully utilize and expand existing and nascent corridors like INSTC, Chahbahar Port promoting their integration with regional transport networks.
 - **Digital Connectivity:** Emphasize digital infrastructure development, cross-border e-commerce, and digital payment systems to foster seamless economic interaction e.g. sharing India’s UPI success, digital public infrastructure models.
 - **Local Currency Trade Settlement:** Build viable financial settlement architecture in local currencies for intra-bloc trade to reduce exposure to external economic shocks and currency volatility.
 - Identify specific sectors for enhanced cooperation, such as energy (including renewables), agriculture (food security), pharmaceuticals, and digital technology, where members have complementary strengths.
6. **Non-Traditional Security Threats:**
 - **Counter-Narcotics:** Enhance cooperation through RATS to combat illicit drug trafficking, which often funds terrorism and organized crime in the region.
 - **Cyber Security:** Push for joint initiatives and capacity building in cybersecurity, a growing threat to all member states.
 - **Disaster Management:** Promote cooperation in disaster response and humanitarian assistance, drawing on India’s expertise and resources.
 - **Climate Change:** Advocate for greater cooperation on climate change mitigation and adaptation strategies, particularly given the shared environmental challenges like water scarcity and desertification in the region.

7. **Balance Major-Power Influence:** The SCO should maintain an inclusive and balanced framework by preventing dominance by any single power, ensuring equal participation, mutual respect, consensus-based decision-making and consideration of smaller members' interests.

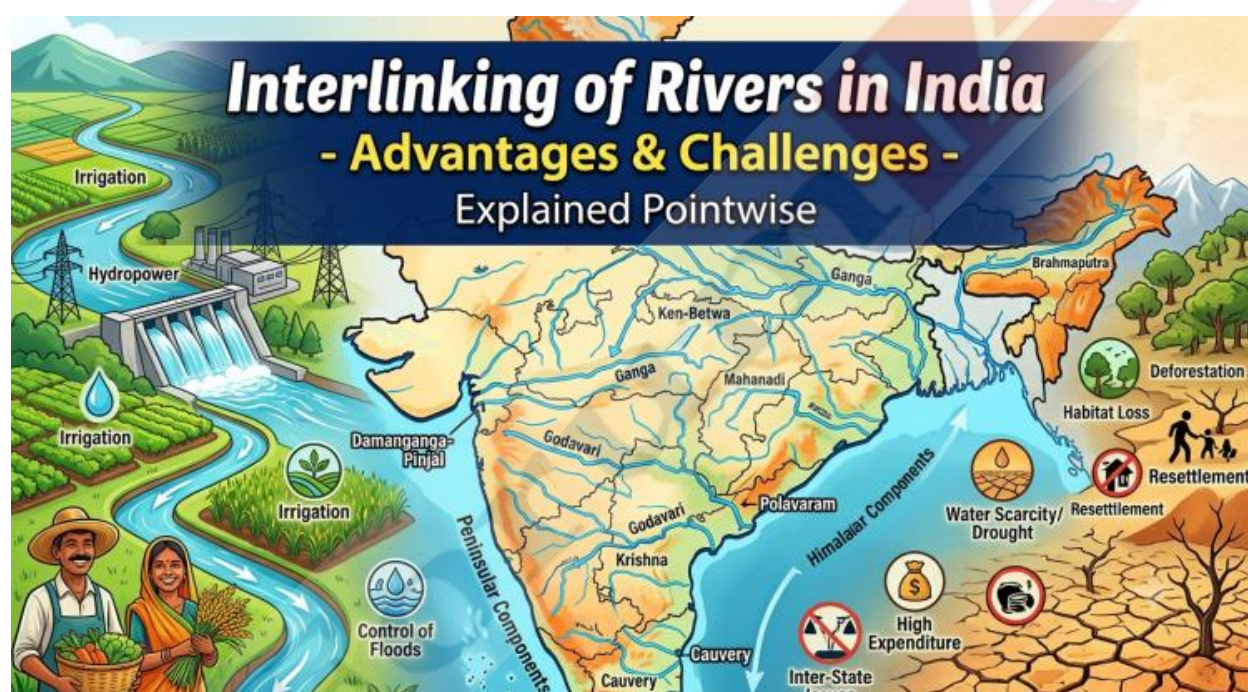
Conclusion:

For India, the SCO remains a platform of both opportunities and constraints. Thus, India needs to devise a strategy that is **assertive on core national interests (like terrorism and sovereignty)**, **pragmatic in economic engagement**, and **diplomatically nimble in balancing competing geopolitical currents**.

Read more: [The Indian Express](#), [Wikipedia](#)

UPSC GS Paper-2: International Relations

Interlinking of Rivers in India – Advantages & Challenges – Explained Pointwise



Recently, Union Home Minister Amit Shah proposed linking major rivers from the Brahmaputra to the Godavari and Cauvery at the Southern Zonal Council meeting. He argued this could prevent water shortages for 100 years, create waterways, and reduce fuel costs. He also urged southern states to resolve water disputes through dialogue.

What is the National River Linking Project (NRLP)?

- The **National River Linking Project (NRLP)**, formerly known as the National Perspective Plan (formulated in 1980), is an ambitious Government of India initiative to **transfer water from relatively water-surplus river basins to water-deficit regions** through a network of dams, reservoirs, canals and other water-transfer structures.
- It proposes to connect 14 Himalayan and 16 peninsular rivers with 30 canals and 3,000 reservoirs to form a gigantic South Asian Water Grid. In total, 30 interlinking projects have been identified under the project.

- The initial plan to interlink India's rivers came in 1858 from a British irrigation engineer, **Sir Arthur Thomas Cotton**.
- NRLP includes two components:

Himalayan component	○ This component aims to construct storage reservoirs on the Ganga and Brahmaputra rivers, as well as their tributaries in India and Nepal. ○ It includes 14 links. ○ It will connect: 1. The Ganga and Brahmaputra basins to the Mahanadi basin. 2. The Eastern tributaries of the Ganga with the Sabarmati and Chambal river systems.
Peninsular component	○ It includes 16 links that propose to connect the rivers of South India. ○ It envisages linking: 1. The Mahanadi and Godavari to feed the Krishna, Pennar, Cauvery, and Vaigai rivers 2. The Ken river to the Betwa, Parbati, Kalisindh, and Chambal rivers 3. West-flowing rivers to the south of Tapi to the north of Bombay 4. Linking some west-flowing rivers to east-flowing rivers.

- The NRLP is managed by **National Water Development Agency** (NWDA) under the Ministry of Jal Shakti. NWDA was set up in 1982, to conduct surveys and see how feasible proposals for interlinking river projects are. Recently, it has been reported that the Centre is deliberating on creation of a **National River Interlinking Authority** (NIRA). It will have powers to set up SPV for individual link projects.
- As of August 2026, the **Ken-Betwa Link Project (KBLP)** is the only one that has entered the implementation stage.
- **Previous examples of river-linking in India:** In the past, several river linking projects have been taken up. For instance:
 1. **Periyar-Vaigai Project:** Under the **Periyar Project**, transfer of water from Periyar basin to Vaigai basin was envisaged. It was commissioned in 1895.
 2. **Godavari-Krishna Link:** Godavari River has also been formally interlinked with the Krishna River at Ibrahimpatnam (near Vijayawada) in Andhra Pradesh in September 2015.

What are the advantages of Interlinking of Rivers?

1. **Addressing the Hydrological Imbalance of India (Drought and Flood Mitigation):** India has a large-scale hydrological imbalance with an effective rainfall period of 28 to 29 days. Some regions receive very high rainfall while some face droughts. Transfers water from flood-prone basins (Brahmaputra, Ganga tributaries in Bihar/Assam) to drought-prone peninsular basins, offering a dual solution to two recurring disasters.

2. **Improvement of inland waterways:** Interlinking of rivers will create a network of navigation channels for the growth and development of inland waterways in India. Expanding canal networks can create interconnected, eco-friendly inland shipping routes for bulk cargo, reducing logistics costs and highway congestion and supporting the broader push under the **Jal Marg Vikas Yojana**.
3. **Aiding irrigation potential:** The interlinking of rivers has the potential to irrigate around **35 million hectares** of land in the water-scarce western peninsula. This will help in reducing the dependence on monsoon variability, stabilizing farmer incomes and cropping intensity, especially in drought-prone Bundelkhand, Marathwada, and Rayalaseema. For e.g. The Ken-Betwa project alone is expected to irrigate approximately **10.62 lakh hectares** of farmland annually.
4. **Hydropower Generation:** The interlinked rivers have the potential to generate a total hydropower of around **34 GW**. This will help India to reduce coal-based power plant usage and will help to achieve India's targets under the Paris agreement. For e.g. The Ken-Betwa project will generate 103 MW of hydropower.
5. **Drinking water supply:** The project envisages a supply of clean drinking water amounting to **90 billion cubic meter**. It can help in the resolution of the issue of drinking water scarcity in India. For e.g. The Ken-Betwa project will benefit approximately **62 lakh people** in Madhya Pradesh and Uttar Pradesh.
6. **Boost to industries:** Interlinking of rivers has the potential to provide around 64.8 billion cubic meter of water for industrial use. Thus, by ensuring reliable water availability, interlinking of river can support industrial expansion, attract investment, generate employment and promote balanced regional economic development.
7. **Groundwater Relief:** By providing surface water alternatives, interlinking of rivers can reduce over-extraction of groundwater in over-exploited blocks (e.g. Punjab, parts of Tamil Nadu), aiding long-term aquifer recovery.
8. **Environmental benefits:** Interlinking can improve ecological water availability, support wetlands and wildlife habitats, sustain riverine ecosystems, and reduce drought-induced forest-fire risks by maintaining moisture levels and water availability in vulnerable landscapes.

What are the issues/challenges in Interlinking of Rivers?

The interlinking of rivers project has a variety of challenges. They are,

1. **Impact of the Climate change:** Reports suggest that climate change could lead to the loss of nearly one-third of the Hindu Kush region's glaciers by 2100. Consequently, Himalayan rivers may not remain "water-surplus" for long. Moreover, changing rainfall patterns and water availability across the Indian subcontinent could undermine the long-term viability of river-linking projects. Thus, investing billions in such infrastructure may yield diminishing or only short-term benefits if future hydrological conditions differ significantly from present projections.
2. **Human cost of Displacement:** Large infrastructure projects may submerge villages and agricultural land. It will lead to large scale displacement & loss of livelihood of mainly **Tribal and forest-dependent communities**. For e.g. Ken-Betwa project alone is expected to displace **over 7,000 families**, with many belonging to indigenous **Gond and Kol** tribes whose livelihoods are tied to the land and forests.
3. **Huge financial cost:** NRLP is a highly capital-intensive project. In 2001, the total cost for linking the Himalayan and peninsular rivers was estimated at **Rs 5,60,000 crore**, excluding the costs of relief and rehabilitation, and other expenses. The cost-benefit ratio might no longer be favourable for the implementation of river interlinking projects. For e.g. the cost of the Ken-Betwa project has skyrocketed by over **2,100%** from its initial estimate, raising questions about financial viability.

4. Impact on ecology and biodiversity:

- Construction of dams, reservoirs and canals can lead to deforestation, habitat fragmentation and biodiversity loss for e.g. **Ken-Betwa Link Project**, which submerges nearly **6,000 hectares** of the core area of the **Panna Tiger Reserve**.
- Moreover, with the ecology of every river being unique, letting the waters of rivers mix may affect biodiversity. Also, when most of the rivers in the country are polluted, this may cause mixing of a less polluted river with a more polluted one.
- A key risk is the movement of **invasive alien species** from “surplus” to “deficit” basins. For instance, linking the Krishna River (which hosts 13-15 invasive species) to the Kaveri basin (which hosts 7-9) is projected to facilitate the spread of these invasives southward, threatening native biodiversity

5. **Impact on Wildlife:** River-linking projects can fragment wildlife habitats, disrupt migration corridors and alter aquatic ecosystems. For example, the **Ken-Betwa project** involves forest submergence in **Panna**, raising concerns over tiger habitat and biodiversity conservation.

6. **International Challenges:** Interlinking Himalayan rivers like the Brahmaputra involves transboundary water-sharing dynamics with neighboring countries like **Nepal, Bhutan, and Bangladesh**, raising international diplomatic and sovereignty concerns.

7. **Inter-State River Disputes:** Water is a State subject in India. So the implementation of the NRLP primarily depends on Inter-State cooperation. Several states including Kerala, Andhra Pradesh, Assam, and Sikkim have already opposed the NRLP.

8. **Infrastructural Challenges:** The government is proposing a canal irrigation method for transmitting water from one area to the other. The maintenance of canals is also a great challenge, as it includes preventing sedimentation, clearing logging of waters. Further, the government faces the challenge of acquisition of large-scale lands for the smooth implementation of the project.

What should be the way forward?

1. **Comprehensive Reassessment:** Commission an independent, comprehensive and transparent reassessment of all proposed river links, incorporating the latest climate models rather than relying solely on historical data. This would help identify which basins are genuinely water-surplus or water-deficit under future climate scenarios.
2. **Prioritize Intra-State & Small-Scale Links:** Instead of massive inter-state mega-links that trigger political disputes, focus on smaller, intra-basin projects (for e.g. the Kosi-Mechi or localized intra-state links) that carry lower ecological footprints and are easier to execute.
3. **Prioritise Economically Viable Links:** Prioritise river-linking projects where long-term benefits in irrigation, drinking water and power generation clearly outweigh financial, environmental and rehabilitation costs, ensuring efficient and sustainable utilisation of public resources.
4. **Climate-Resilient Planning:** River-linking projects should incorporate climate projections, glacier dynamics, changing monsoon patterns and extreme weather events into planning, ensuring that infrastructure remains viable and water transfers remain sustainable under future hydrological uncertainties.
5. **Minimise Displacement and Ecological Damage:** River-linking projects should minimise displacement through careful site selection, environmental impact assessments and alternative designs. Ecologically sensitive forests and wildlife habitats must be protected, while affected communities receive fair compensation, rehabilitation and livelihood support.
6. **National Waterways Project (NWP):** As per some experts, the govt should consider the National Waterways Project (NWP) instead of the NRLP. Under NWP, water from a flooded river will flow to the other. It acts like a water grid, similar to a power grid. It just needs 1/3rd the land required for

interlinking of rivers, is open to navigation throughout the year and involves zero pumping. Furthermore, it can irrigate almost double the land and has a 76% more power generation capacity (60 GW) compared to the interlinking of rivers project.

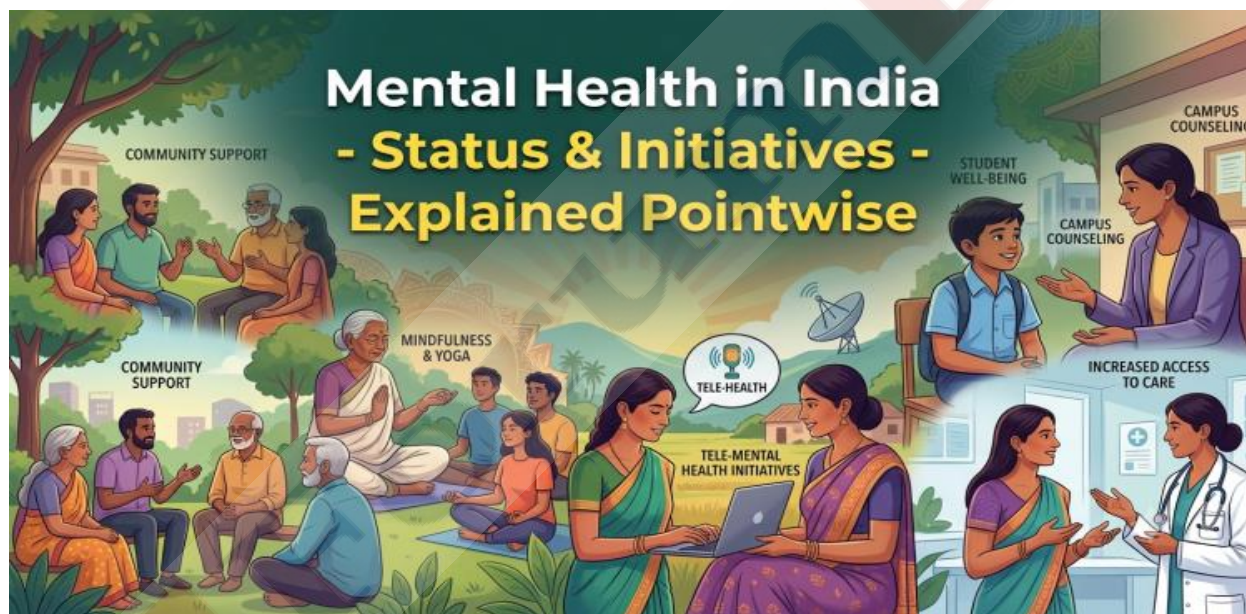
7. **Prioritize Local and Nature-Based Solutions:** Initiatives like watershed development, rainwater harvesting, groundwater recharge, and rejuvenation of local water bodies can provide sustainable water security at a local level. These are often cheaper and create less social and environmental disruption than massive inter-basin transfers.

Conclusion: The interlinking project offers immense potential for water security but demands a science-based, people-centric approach, prioritizing ecological safeguards and fair rehabilitation over financial ambition.

Read More: [The Hindu](#)

UPSC Syllabus- GS 1- Indian Geography

Mental Health in India – Status & Initiatives – Explained Pointwise



Rising suicides among students, farmers, and homemakers across India underline a silent yet deepening mental health crisis. Despite progressive legislation and growing awareness, mental healthcare remains underfunded, understaffed, and stigmatized.

What is Mental Health?

- **Mental health** refers to a state of emotional, psychological and social well-being that enables an individual to cope with the normal stresses of life, develop and maintain healthy relationships, work productively, and contribute to society. It is an integral part of overall health and well-being.
- The World Health Organization (WHO) defines mental health as “**a state of well-being in which an individual realizes their own abilities, can cope with the normal stresses of life, can work productively, and is able to make a contribution to their community.**”

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- **Core pillars of mental health:** Mental health has 4 core pillars:
 1. **Emotional Well-being:** The ability to process and express a full range of emotions. It's not about avoiding negative emotions, but about riding them out without being destroyed by them.
 2. **Psychological Well-being:** How you perceive yourself and your life. This includes having a sense of purpose, feeling capable of learning and growing, and having the ability to make your own decisions.
 3. **Social Well-being:** The ability to build and maintain healthy relationships, feel a sense of belonging, and communicate effectively with others.
 4. **Cognitive Well-being:** The ability to think clearly, focus, remember information, and solve problems.

What is the current Mental Health Scenario in India?

Prevalence and Burden	● The National Mental Health Survey (NMHS) estimated that 10.6% of adults were suffering from a current mental disorder. ● According to WHO 2023 estimates, over 200 million Indians (roughly 1 in 7) live with a diagnosable mental health condition. ● Depression affects an estimated 56 million Indians (about 4.5% of the population), and anxiety disorders affect around 38 million, per WHO data. ● India accounts for roughly 15% of the global mental health burden, per a 2017 Lancet estimate. ● Lifetime prevalence stands at 13.7%, while WHO estimates 16.3 suicide deaths per 1,00,000 people. ● India's mental health burden equals 2,443 Disability-Adjusted Life Years (DALYs) per 10,000 population.
Suicide Statistics (NCRB 2023)	● 1,71,418 suicides were recorded, with men comprising 72.8% of victims. ● Family problems (31.9%), illness (19%), and marital issues (10%) were leading causes. ● Farmer suicides stood at 10,786, or 6.3% of total suicides. ● Andaman & Nicobar Islands, Sikkim, and Kerala reported the highest suicide rates.
Treatment Gap and Workforce Shortage	● Treatment gaps remain extremely high (70-92%) across different mental disorders, with 85% gap in common disorders like depression. This indicates that a large proportion of affected people do not receive appropriate care. ● Only 0.75 psychiatrists and 0.12 psychologists per 1 lakh population, far below the WHO norm of 3. ● Rehabilitation services meet less than 15% of national needs.

Economic and Social Costs	• Untreated mental illnesses may cost India over \$1 trillion by 2030. • Employers lose ₹1.1 lakh crore annually due to absenteeism and burnout. • Suicide remains the leading cause of death among youth (15-29 years).
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What are the major factors contributing to the mental health crisis in India?

1. **Socio-Economic and Financial Stress:** High unemployment (7.3% in 2024), rising debt, and job insecurity have triggered widespread anxiety. As per **NCRB (2023)**, **31.9% of suicides** stemmed from family and financial distress, with farmers and informal workers most affected. Farmer suicides, driven by debt, crop failure, and market shocks, remain a persistent tragedy, with over **1,00,000 farmers** having taken their lives since 2014.
2. **Educational and Professional Pressure:** Exam stress and fear of failure have made students vulnerable. A 2024 Indian Psychiatric Society study found around **40% of Indian teenagers** cite stress and anxiety as their main concern, linked to academic pressure (NEET, JEE, coaching-hub isolation in places like Kota). Long working hours and workplace burnout add to adult psychological strain.
3. **Urbanisation and Social Isolation:** Migration, nuclear families, and digital lifestyles have eroded traditional support systems, making **urban residents twice as likely** to report loneliness as rural populations.
4. **Gendered and Domestic Challenges:** Nearly **29% of women** (NFHS-5) have faced domestic violence, leading to high rates of depression and anxiety linked to emotional neglect and unpaid care work.
5. **Digital & Social Media Exposure:** Excessive or harmful use of digital platforms can contribute to social comparison, cyberbullying, sleep disruption and anxiety, particularly among young people. Excessive screen time and social media usage heighten anxiety, low self-esteem, and body-image issues. **National Institute of Mental Health and Neurosciences (NIMHANS), 2022** found adolescents online for **4+ hours daily** more prone to such disorders.
6. **Social Stigma and Cultural Misconceptions:** Over **half of Indians** still view mental illness as weakness, causing delayed diagnosis and low treatment-seeking, especially in rural areas. Fear of social ostracization, damaging "family honor," or ruining marriage prospects leads families to hide conditions or delay medical intervention.
7. **Lack of Awareness:** A large part of the population, especially in rural areas, lacks awareness about mental illness and may not even recognize its symptoms. It often leads to symptoms being dismissed as physical weakness, lack of willpower, or spiritual faults.
8. **Systemic Deficiencies:** With just **1.05% of the health budget** for mental health and **0.75 psychiatrists per lakh people**, India faces a **70-92% treatment gap**, reflecting weak infrastructure and policy execution. Moreover, mental healthcare infrastructure is heavily concentrated in urban areas, leaving rural populations with an almost complete lack of services and support.

What are the major government initiatives for promoting mental health in India?

Mental Healthcare Act, 2017	• Establishes a rights-based framework for mental healthcare, including the right to access mental-health services, protection from discrimination and regulation of mental-health establishments. • Recognises mental health as a legal right under Article 21.
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	- Decriminalises suicide, mandates insurance coverage, and guarantees affordable, dignified care. - Empowers individuals to make advance directives for treatment.
Rights of Persons with Disabilities Act, 2016	It includes mental illness within its disability framework, extending reservation and protection benefits.
National Mental Health Policy (2014)	Provides a policy framework focused on mental well-being, prevention, treatment, rehabilitation, reduction of stigma and protection of the rights of persons with mental illness.
National Mental Health Programme (NMHP) (1982)	- Aims to integrate mental healthcare into primary health systems. - Now expanded to 767 districts, though many face staff and funding shortages.
District Mental Health Programme (DMHP) (1996)	- It is the grassroots operational arm of the NMHP. - Provides mental-health services at the district level, including early detection, treatment, counselling, awareness generation and training of healthcare workers. - It has been sanctioned for 767 districts. The programme now covers more than 90% of the districts. - It integrates mental health services into Primary Health Centres (PHCs) and Community Health Centres (CHCs).
Tele MANAS (2022)	National Tele Mental Health Programme (Tele-MANAS): - Provides 24×7 tele-mental-health counselling and care through the toll-free number 14416, particularly benefiting people in remote and underserved areas. - Has conducted over 20 lakh tele-counselling sessions, improving access in underserved areas. Tele-MANAS Mobile Application: Launched in 2024, the app provides mental-health support and complements the Tele-MANAS helpline.

NIMHANS (National Institute of Mental Health and Neurosciences)	- It is the apex institute for treatment, training, and research on mental health in India. - It anchors much of India's psychiatric workforce training and policy research.
National Suicide Prevention Strategy (2022)	Aims to reduce suicide rates by 10% by 2030 through early detection, awareness campaigns, and responsible media reporting.
Manodarpan Initiative	- Launched during COVID-19 to provide psychosocial support to students, teachers, and families under the Atmanirbhar Bharat Abhiyan. - Reached over 11 crore students through school-based awareness programmes
Judicial Backing	In Sukdeb Saha vs State of Andhra Pradesh, the Supreme Court affirmed mental health as part of the Right to Life (Article 21), binding the state to ensure accessible and quality care.

What should be the way forward to improve mental healthcare in India?

- Increase Budgetary Allocation:** Increase the overall health budget and mental health's share within it to at least 5% (currently ~1%) of total health expenditure to improve infrastructure, medicine supply, and service delivery in mental healthcare.
- Expand and Train Workforce:** Build a stronger pool of mental health professionals by training mid-level providers, counsellors, and community nurses. Expand psychiatry seats and mandate stronger psychiatric training in undergraduate (MBBS) curricula.
- Expanding Infrastructure Beyond Metros:** Strengthen mental-health infrastructure in tier-2/3 cities, rural and remote areas through district hospitals, community centres, trained professionals, telemedicine and referral networks. Offer fellowships, targeted postgraduate seats, and financial incentives for doctors, clinical psychologists, and psychiatric nurses willing to serve in rural and semi-urban districts.
- Integrate Mental Health into Primary Care:** Integrate routine mental health checkups and essential psychotropic medication distribution into local Ayushman Arogya Mandirs (formerly Health & Wellness Centres) and ensure basic counselling at every Primary Health Centre (PHC).
- Promote Community-Based Interventions:** Strengthen peer support networks and village-level counselling through trained ASHA and Anganwadi workers to enhance accessibility at the grassroots level. India must invest more systematically in community-based care. Programmes like Zimbabwe's Friendship Bench that focus on training the community workers can help in bridging the gap between awareness & treatment – particularly in rural & underserved populations.

6. **Address Stigma and Raise Awareness:** Launch a massive, country-wide public awareness campaign (like those for TB or HIV) to tackle stigma and educate people about symptoms, introduce mental health education in schools, and encourage open discussions to normalise help-seeking behaviour. Mandate age-appropriate mental health literacy, stress management, and full-time counselors across state and central education boards.
7. **Ensure Digital and Regulatory Safeguards:** Regulate mental health apps and AI tools to ensure privacy, ethical standards, and professional oversight, preventing misinformation and misuse.
8. **Enhance Governance and Coordination:** Establish a National Mental Health Observatory for monitoring outcomes and align inter-ministerial efforts across Health, Education, Women & Child Development, Labour, and Agriculture for an integrated approach.
9. **Adopt a Whole-of-Society Approach:** Address underlying determinants such as poverty, unemployment, domestic violence, social isolation, substance abuse and discrimination through coordinated action across health, education, labour and social-welfare sectors. WHO specifically advocates a **multisectoral, life-course and whole-of-government approach** to mental health.

Conclusion: India's mental health crisis is a profound challenge, but the path forward is clear. Bridging the vast treatment gap requires moving beyond awareness to systemic action i.e. integrating care into communities, destigmatizing help-seeking, and transforming policy into accessible, compassionate reality for every citizen. Prioritising mental well-being is essential for building a **healthy, productive and inclusive Viksit Bharat**.

Read more: [The Hindu](#)

UPSC Syllabus- GS 2- Issues related to health

India's GDP Growth – Methodology & Concerns – Explained Pointwise



India's latest GDP data has ignited controversy, with critics alleging that a sharp downward revision of the previous year's base artificially inflated the growth figures. While the government defends updated methodologies, the opacity surrounding these revisions has intensified demands for greater transparency, reliability, and credibility in India's national income statistics.

How is GDP estimated in India?

- Gross Domestic Product (GDP) is the total monetary value of all final goods and services produced within the geographical boundaries of India during a given period.
- In India, GDP estimates are prepared by the **National Statistical Office (NSO), Ministry of Statistics and Programme Implementation (MoSPI)**. The NSO releases GDP estimates on a **quarterly and annual basis**.
- India aligns its methodology with the United Nations **System of National Accounts (SNA 2008)** framework, calculating GDP primarily using two complementary sides: the **production/supply side (Gross Value Added)** and the **expenditure/demand side**:

Production Side	Gross Value Added (GVA): ○ To calculate the GDP, GVA at basic prices across eight major economic sectors is calculated first. ○ The GDP at market price is then calculated using the formula: GDP = GVA at basic prices + Product Taxes – Product Subsidies
Expenditure Side	○ To cross-verify and capture aggregate demand in the economy, NSO calculates GDP using the expenditure method: GDP = PFCE + GFCE + GFCF + CIS + Valuables + (X – M) PFCE (Private Final Consumption Expenditure): Spending by households and non-profit institutions serving households on goods and services. GFCE (Government Final Consumption Expenditure): Current operational expenditures by central and state governments (wages, salaries, goods/services), excluding transfers.

	GFCF (Gross Fixed Capital Formation): Domestic capital investment in infrastructure, machinery, buildings, and intellectual property. CIS (Changes in Stocks/Inventories): Net additions to inventory holdings. Net Exports (X – M): Total exports of goods and services minus total imports
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- For calculating real GDP, a **base year** is used to compare economic activity after removing price effects. India has recently shifted its GDP base year from **2011-12 to 2022-23**, as part of an effort to make national income estimates more representative of the current structure of the economy.

Why are GDP estimates revised periodically & What are the challenges associated with such revisions?

1. **Availability of more complete data:** Initial GDP estimates are often based on limited or provisional data. As more comprehensive information from industries, government departments and surveys becomes available, earlier estimates are revised to improve their accuracy and reliability.
2. **Improvement in data quality:** As more comprehensive and reliable data become available from surveys, administrative records, industries and government agencies, GDP estimates are revised to incorporate this information, thereby improving their accuracy and reflecting actual economic activity more effectively.
3. **Changes in methodology:** Statistical authorities periodically update the methods, data sources and estimation techniques used to calculate GDP to reflect structural changes in the economy, improve accuracy, incorporate new datasets and provide a more reliable picture of economic activity.
4. **Change in base year:** The periodic revision of the GDP base year helps capture structural changes in the economy, updated consumption patterns, emerging sectors and improved data sources, thereby making GDP estimates more relevant and representative of current economic conditions.

Challenges associated with GDP revisions:

1. **Difficulty in comparing different estimates:** Frequent revisions to GDP estimates can make it difficult to compare preliminary and revised figures. Changes in methodology, base year and data sources may also affect historical growth rates, complicating meaningful economic comparisons.
2. **Impact on policy decisions:** GDP revisions can affect fiscal and monetary policy decisions, as policymakers may reassess economic conditions, growth prospects and policy priorities based on updated estimates, potentially altering government spending, taxation and interest-rate decisions.
3. **Credibility concerns:** Large or unexpected revisions in GDP estimates may raise doubts about the reliability and transparency of official statistics, affecting public trust, investor confidence and the credibility of economic policymaking.
4. **Impact on investor confidence:** Frequent or significant revisions in GDP estimates can create uncertainty about India's economic performance, potentially affecting investor confidence. Greater

transparency, consistency and timely communication regarding revisions can help maintain trust among investors.

What are the major concerns raised over the latest GDP growth estimates of India?

1. **Change in the GDP base year:** The government has shifted the GDP base year from **2011-12 to 2022-23**. Though, this is a standard statistical exercise, but comparisons between the old and new series can create confusion. The critics have questioned whether the revised series makes current growth appear stronger because of changes in the historical data.
2. **Concerns over GDP deflator:** Real GDP growth is calculated by adjusting nominal GDP for inflation using a deflator, and in recent quarters India's real GDP growth has moved unusually close to nominal GDP growth because the price deflator used has been exceptionally low. This occurs because the deflator is heavily influenced by a depressed Wholesale Price Index (WPI), which is weighted toward global commodity prices that have remained soft, even as the Consumer Price Index (CPI) has stayed significantly higher.
3. **Large revisions to past GDP estimates:** The new series has substantially revised earlier GDP levels and growth rates. This has raised questions about the comparability of the old and new series and the interpretation of historical economic performance. However, MoSPI maintains that revisions are normal and reflect improved data and methodology.
4. **Disconnect between GDP growth and employment:** A major concern is whether strong headline GDP growth is translating into adequate employment and wage growth, particularly for India's large youth population. Critics have pointed out that weak employment conditions are inconsistent with such a high growth rate.
5. **Investment and Capital Flows:** Despite the impressive GDP figure, foreign investors have been net sellers of Indian stocks, offloading over \$230 billion this year. This suggests that global investors are not fully convinced by the growth narrative and are concerned about underlying structural weaknesses.
6. **Question of domestic investment:** Critics have raised concerns about whether the high GDP growth is accompanied by a proportionate increase in private investment and productive capacity. This raises questions about the sustainability of the reported growth rate.

What measures can be taken to improve the transparency, reliability and credibility of India's national income statistics?

1. **Statutory Backing for the National Statistical Commission (NSC):** As originally recommended by the Rangarajan Commission, the NSC should be given statutory authority and legislative independence, making it directly accountable to Parliament rather than the Ministry of Statistics and Programme Implementation (MoSPI).
2. **Improve data collection:** Strengthen statistical surveys and administrative databases to ensure timely, accurate and comprehensive data. Greater use of digital technologies, GST records and other reliable administrative sources can improve coverage and reduce data gaps.
3. **Increase transparency:** The government should make GDP-related datasets, methodologies, assumptions and revision procedures publicly accessible. Clear explanations of changes in estimation methods and periodic revisions can enable independent scrutiny and strengthen public confidence in official statistics for e.g. when major series or base-year overhauls occur, MoSPI should provide complete technical documentation, data scripts, and open access to anonymized unit-level microdata.
4. **Regularly update the base year:** The GDP base year should be periodically updated to reflect changes in the structure of the economy, consumption patterns, prices and emerging sectors, thereby ensuring that GDP estimates accurately represent contemporary economic activity.

5. **Strengthen independent scrutiny:** Strengthen independent scrutiny by involving independent economists, statisticians and experts in reviewing GDP estimation methodologies and data. Regular peer reviews and external audits can identify methodological gaps, improve accuracy and enhance public confidence.
6. **Improve coordination among agencies:** Strengthen coordination between MoSPI, RBI, government ministries and State Statistical Agencies to ensure consistent data collection, minimise discrepancies, improve data sharing and enhance the accuracy and reliability of national income estimates.
7. **Build statistical capacity:** Build statistical capacity by investing in skilled manpower, modern technology, digital data systems and training across statistical institutions. This can improve data collection, processing and analysis, thereby enhancing the accuracy, timeliness and reliability of national income statistics.

Conclusion: A credible statistical system requires not only accurate data but also transparency in methodology and revisions. Strengthening India's statistical institutions, improving data quality and enabling independent scrutiny can enhance confidence in national income estimates.

UPSC GS-3: Indian Economy

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Inflation Targeting in India – Effectiveness & Challenges – Explained Pointwise



India has just completed a decade of inflation targeting as a formal policy framework of the RBI. The RBI adopted the Inflation Targeting on the recommendations of the **Urjit Patel Committee** in 2016. Hence, there is a requirement for an elaborate review to examine the performance of this method. In this article, we will analyze the performance of Inflation Targeting in India so far.

What is Inflation Targeting (IT)?

- **Inflation Targeting** is a **monetary policy framework** in which the central bank publicly announces a specific inflation-rate target and uses policy tools – especially **interest rates** – to keep inflation close to that target.
- Inflation Targeting was first formally adopted by **New Zealand in 1990**, followed by countries such as **Canada (1991), the UK (1992), and Sweden (1993)**. It subsequently emerged as a widely used monetary policy framework globally. In India, **Inflation Targeting** was formally institutionalised in **2016** through amendments to the **RBI Act, 1934, (Section 45ZA)**, based on the recommendations of the **Urjit Patel Committee (2014)**.
- **Types of inflation targeting:**
 1. **Strict inflation targeting(SIT):** Under this, the central bank only focuses on keeping inflation, close to a given inflation target.
 2. **Flexible inflation targeting(FIT):** Under this, apart from inflation, the central bank is also concerned about other variables like the stability of interest rates, exchange rates, output and employment ratios.
- The Reserve Bank of India follows **Flexible Inflation Targeting**, with a target of **4% CPI inflation $\pm$ 2 percentage points** (i.e., 2%-6%).

Basic Terminologies:

- **Monetary Policy:** It is the macroeconomic policy laid down by the central bank that focuses on the management of money supply and interest rates.
- **Inflation:** It refers to a sustained/continuous rise in the general price level of goods and services in an economy over a period of time.
- **Headline inflation:** It is a measure of total inflation in an economy. In India, Consumer Price Index Combined (CPI -C) represents Headline Inflation.
- **Core inflation:** It is the inflation level after subtracting the food and fuel inflation from the Headline Inflation.
- **Repo Rate:** It is the rate at which RBI provides short-term loans to banks against the collateral of government and other approved securities under the liquidity adjustment facility (LAF).
- **Shut Period:** It is the period for which the securities cannot be traded

Background of Inflation Targeting:

- The Finance Act, 2016 amended the Reserve Bank of India Act, 1934 (RBI Act) . The amendment facilitated a statutory and institutionalized framework for a **Monetary Policy Committee(MPC)**.
- MPC was entrusted with the task of fixing the benchmark policy interest rate (repo rate) to **contain inflation** within the specified target level i.e. inflation targeting.
- A flexible inflation target (FIT) of 4% was decided with a deviation of +or-2%. Further, **headline consumer price inflation** was chosen as the **key indicator**.
- This agreement between the Center and the RBI on inflation targeting is set to end on 31st March 2021.

What are the advantages of adopting the Inflation Targeting framework?

1. **Price Stability:** Inflation targeting framework provides a clear, quantifiable target (4% +/-2%) that anchors long-term price expectations for households, firms, and investors, reducing uncertainty in economic planning.

2. **Anchors Inflation Expectations:** A credible numerical target helps households and businesses form stable expectations about future inflation.
3. **Reduces Inflation Volatility:** A credible inflation target enables timely monetary policy responses to demand and supply shocks, preventing temporary price pressures from becoming persistent and reducing overall inflation volatility.
4. **Improves Investment Climate:** Stable and predictable inflation reduces uncertainty over costs, interest rates and returns, encouraging domestic and foreign investment and facilitating long-term economic planning.
5. **Protects Vulnerable Sections:** Low and stable inflation safeguards the purchasing power of poorer households, whose incomes are often fixed and who spend disproportionately on essential goods.
6. **Enhances Transparency & Accountability:** A clearly defined inflation target enables assessment of the central bank's performance against measurable objectives, thereby promoting greater transparency, responsibility and accountability in monetary policy.
7. **Supports Sustainable Growth:** By maintaining macroeconomic stability, inflation targeting creates conditions conducive to long-term economic growth rather than short-term growth driven by excessive monetary expansion.
8. **Global alignment and easier benchmarking:** Inflation targeting framework aligns India with the dominant global monetary policy framework, easing cross-country comparison and enhancing sovereign credit assessments.

What has been the performance of Inflation Targeting framework in India so far?

1. **Lower Average Inflation:** Average CPI inflation declined from **6.8% during 2012-16** to around **4.9% after adoption of FIT**, indicating improved price stability.
2. **Reduced Inflation Volatility:** The standard deviation of headline inflation declined from **2.3% during 2012-16 to 1.5% after 2016**, suggesting greater stability.
3. **Better Anchoring of Inflation:** Inflation has generally remained closer to the **4% target**, strengthening the credibility of monetary policy and helping anchor inflation expectations.
4. **Resilience to Major Shocks:** The framework faced severe disruptions such as **COVID-19 and the Russia-Ukraine war**, which pushed inflation above 6%. Nevertheless, inflation subsequently moderated towards the target.
5. **Institutionalised Monetary Policy:** The creation of the **Monetary Policy Committee (MPC)** has made interest-rate decisions more collective, transparent and accountable.
6. **Growth Not Sacrificed:** A major concern before adoption was that a strict focus on inflation might hinder economic growth. However, RBI analysis indicates that average GDP growth remained broadly stable, while inflation declined substantially, following the second five-year review held in March 2026.
7. **Institutional Validation:** Recognizing its effectiveness in stabilizing macroeconomic fundamentals, the Government of India renewed the **4% target ($\pm 2\%$ band)** framework for another 5-year term through March 2031.

What are the major challenges and limitations of the Inflation Targeting framework in India?

1. **Dominance of Food Inflation:** Food and beverages account for roughly **46% of the CPI basket**. Food prices are heavily influenced by monsoons, crop output and supply disruptions, which cannot be effectively controlled through interest rates.
2. **Limited Effectiveness Against Supply Shocks:** Monetary tightening can reduce demand but cannot directly increase food supply or resolve disruptions caused by oil-price shocks, weather events or global supply-chain disruptions.

3. **Weak Monetary Transmission:** Changes in the RBI's policy rate do not always transmit quickly or fully to lending and deposit rates, particularly because of structural rigidities in India's financial system. This transmission lag reduces the framework's real-time effectiveness in controlling inflation.
4. **Administered Prices:** Prices of commodities such as fuel and some agricultural products are influenced by government policies, taxation and administered mechanisms, limiting the effectiveness of monetary policy alone.
5. **Missed Targets and Forecast Errors:** During the 2019-2024 period, the RBI experienced large and persistent forecast errors, primarily due to the non-transience of food price shocks. Inflation remained above the 6% upper tolerance band for three consecutive quarters, triggering a requirement for the central bank to write a formal explanation to the government.
6. **Vulnerability to external/global shocks:** Global events can trigger inflation beyond the RBI's control. For example, the **Russia-Ukraine war (2022)** caused a sharp rise in crude oil and commodity prices, increasing India's inflationary pressures.
7. **Regional and distributional heterogeneity:** A single national CPI target masks wide regional variation in inflation experience (rural vs urban, state-wise food price differentials), meaning the "average" target may not reflect price stress felt by specific segments of the population.

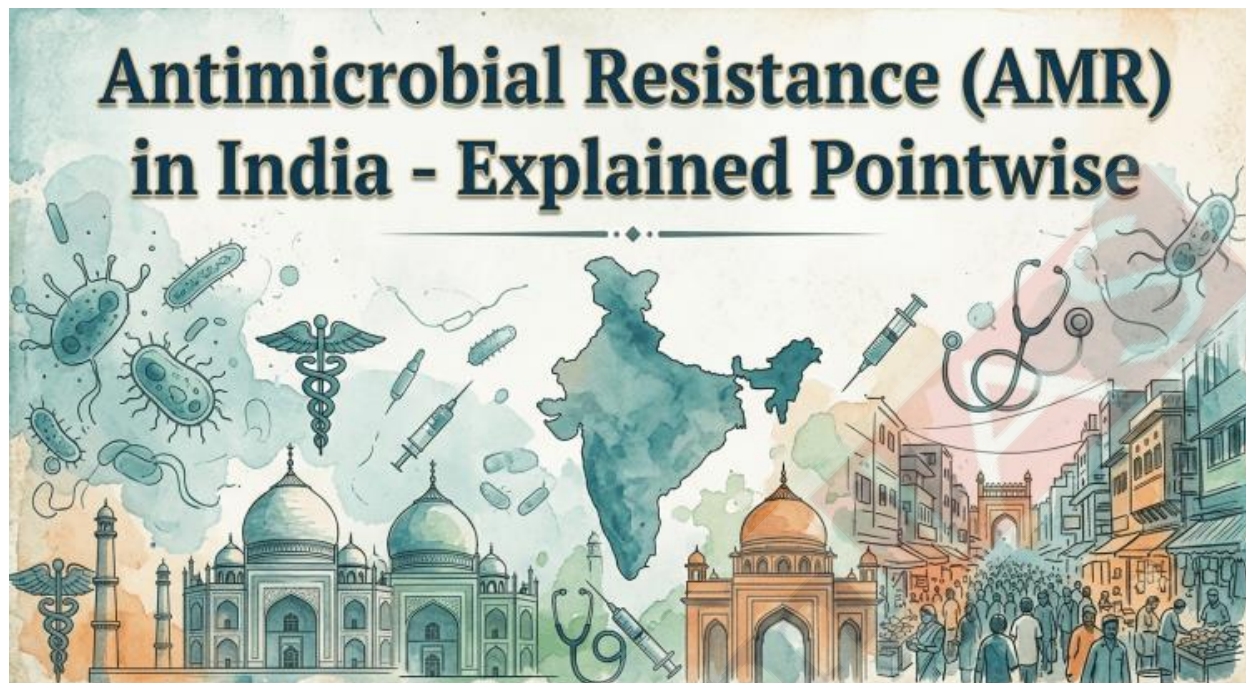
What are the suggestions for improving the Inflation Targeting framework in India?

1. **Improve Inflation Forecasting:** Strengthen RBI's forecasting models, especially for food prices, since persistent forecast errors weaken credibility among forward-looking and adaptive economic agents. This was flagged as a top priority in the 2026 review discussion.
2. **Strengthen Monetary Policy Transmission:** Ensure faster and fuller transmission of RBI policy-rate changes to bank lending rates by improving liquidity management, financial-market depth and banking-sector efficiency, thereby enhancing monetary policy effectiveness.
3. **Address Supply-Side Constraints:** Improve agricultural productivity, storage, logistics and supply chains, while promoting climate-resilient crops to reduce food-price volatility and mitigate inflation arising from supply shocks.
4. **Strengthen Fiscal-Monetary Coordination:** Align fiscal and monetary policies to manage inflation effectively, with the government addressing supply-side pressures while the RBI manages demand, without compromising central bank independence.
5. **Periodically Review the CPI Basket:** Update CPI weights and components regularly to reflect changing consumption patterns, ensuring inflation measurement accurately represents household expenditure and improves the effectiveness of monetary policy.
6. **Address regional and distributional inflation gaps:** Develop supplementary regional or segment-specific inflation indicators to inform policy, given that a single national average can mask significant rural-urban or state-wise price divergence.

Conclusion: Inflation targeting should not operate in isolation. Its effectiveness in India depends on combining credible monetary policy with sound fiscal management, stronger supply chains, agricultural reforms, better data and effective government-RBI coordination.

UPSC GS-3: Indian Economy
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Antimicrobial Resistance (AMR) in India - Explained Pointwise



A recent major study of hospitalised patients across India has found that infections caused by antibiotic-resistant bacteria are more likely to be fatal and more expensive to treat than infections caused by drug-susceptible strains. Conducted by the ICMR's AMR Surveillance Network across 20 tertiary-care hospitals, the study analysed data from nearly 1.6 lakh patients.

What is Antimicrobial Resistance? What are the different kinds of Antimicrobial Resistance?

- Antimicrobial Resistance (AMR) is the resistance of microorganisms (bacteria, virus, parasites and fungi) to an antimicrobial agent (antibiotics, fungicides, antiviral agents and parasiticides), to which they were first sensitive.
- As a result of AMR, standard treatments become ineffective, and infections can persist, potentially spreading to others.
- WHO declared AMR one of the top 10 global public health threats.

Types of Antimicrobial Resistance:

Based on	
Target Pathogen	1. Antibacterial Resistance (Antibiotic Resistance): Bacteria develop defenses against antibiotics (e.g., MRSA, drug-resistant <i>E. coli</i>). 2. Antiviral Resistance: Viruses adapt to resist antiviral medications (e.g., drug-resistant HIV or Influenza strains).

	3. Antifungal Resistance: Fungi become resistant to antifungal treatments (e.g., drug-resistant <i>Candida auris</i>). 4. Antiparasitic Resistance: Parasites survive antiparasitic drugs (e.g., chloroquine-resistant <i>Plasmodium falciparum</i>, which causes malaria).
Origin & Transmission	1. Intrinsic (Natural) Resistance: Natural resistance is caused by the structural characteristics of microbes. It is not associated with the use of antimicrobials. It has no hereditary property (e.g. a bacterium's outer membrane naturally blocking a specific drug). 2. Acquired Resistance: Acquired resistance develops due to the changes in the genetic characteristics of microbes, like changes in structures of chromosomes. This makes the microbes resistant to previous antimicrobial treatment. 3. Cross-Resistance: Resistance developed in microbes against antibiotics having similar structure.
Clinical Severity	1. Multidrug-Resistant (MDR): Microbes resistant to at least one agent in three or more antimicrobial categories. 2. Extensively Drug-Resistant (XDR): Microbes resistant to almost all approved antimicrobial agents, leaving only one or two treatment options. 3. Pandrug-Resistant (PDR): "Superbugs" resistant to all available antimicrobial agents across all categories.

What is the extent of AMR in India according to the National Centre for Disease Control (NCDC) Report on AMR?

1. Bacteria like **E. coli, Klebsiella, Acinetobacter, Staphylococcus aureus, enterococcus** have become resistant to even the latest generation of antibiotics.
2. Third-generation antimicrobial drugs like **cephalosporins, imidazoles, amino-glycosides, ceftriaxone, metronidazole, amikacin** and **piperacillin**, used to treat cold, fever, skin diseases and urinary tract infection have become ineffective.
3. **E. coli** showed over 80% resistance to ampicillin and more than 70% resistance to the third-generation cephalosporin cefotaxime.
4. **MRSA (methicillin-resistant Staphylococcus aureus)** prevalence stood at a national average of 47.8%, but reached as high as 65% in states such as Bihar, where weaker healthcare infrastructure compounds the problem.
5. Inappropriate use of antibiotics in human, animal and agricultural sectors has generated superbugs that are resistant to these antibiotic drugs, which spread due to inadequate sanitation and improper infection prevention in healthcare.

What are the reasons behind the growth of Antimicrobial Resistance in India?

1. **Misuse of antimicrobial medicines:** The use of antibiotic medicine in non-bacterial infections, use of over-the-counter antibiotics, self-medication and emergence of fixed drug compositions, have contributed to the increase in antimicrobial resistance in India. **For e.g.** Overuse of antimicrobial medicines during the Covid-19 outbreak.

2. **Inadequate laboratory facilities:** India lacks severely in the laboratory network and capacity to support Clinicians/Doctors with the bacterial culture test and suggesting an appropriate antibiotic.
3. **Lack of trained healthcare personnel:** There is lack of adequate training of healthcare personnel in antibiotic selection, escalation, and de-escalation.
4. **Inadequacy of healthcare facilities:** Overcrowded hospitals have left very little time for the doctors to examine patient's medical history, conduct proper blood tests and then recommend proper antimicrobial treatment.
5. **Inappropriate use of antimicrobials in agriculture and allied sectors:** The overuse of antimicrobials in agriculture and allied sector have led to increase in AMR. **For e.g.** Use of Colistin as growth promotional agent in poultry farming has led to Colistin AMR in India.
6. **Inadequate monitoring:** India lacks proper monitoring system to control the antibiotic prescription and dispensing practice by health system. **For e.g.** Ineffective monitoring to stop the sale of over the counter antibiotics.
7. **Self-Medication:** Patients often take leftover antibiotics or stop their prescribed courses early when symptoms improve, leaving surviving, resistant bacteria to multiply.
8. **Patient Non-Compliance:** When patients don't complete their full course of antibiotics, the infection isn't fully cleared, and the surviving bacteria are more likely to develop resistance.
9. **Crony capitalism:** The pharmaceutical industry incentivises the sale of antibiotics by being hand in gloves with the healthcare personnel like doctors, pharmacists etc.
10. **Contamination around pharmaceutical manufacturing sites:** The untreated waste from the pharmaceutical industries releases large amounts of active antimicrobials into the environment.
11. **Inadequate sanitation facilities:** Poorly functioning sanitation systems like open defecation, poorly contained septic tanks have led to increase in AMR.
12. **Improper infection prevention in healthcare institutions:** AMR has also spread due to the lack of proper infection prevention mechanism in hospitals, clinics and laboratories. **For e.g.** Candida auris acquired by hospital patients.
13. **No new antimicrobial developments:** The exit of big pharma from antibiotic development and lack of investment from venture capitalists to support the commercial viability of antibacterial agents, has pushed AMR into a global health crisis.

What are the challenges posed by spread of Antimicrobial Resistance?

1. **Threat to the healthcare system:** The antimicrobials helped in significantly reducing the mortality rates in low and middle-income countries (LMICs) of Asia and Africa. The ineffectiveness would impair the modern health system by failing to prevent infections post a routine surgery or cancer treatment.
2. **Loss of Human Lives:** Drug-resistant infections can lead to severe complications and deaths, particularly among ICU patients, newborns, elderly people and immunocompromised patients. AMR is responsible for up to 7 lakh deaths a year (GRAM Project Report). **For e.g.** E.coli and MRSA (Methicillin Resistant Staphylococcus Aureus) are among the drug-resistant bacteria that lead to most deaths.
3. **Economic Brunt:** Prolonged illness and disability keep working-age adults out of the workforce. The World Bank estimates that by 2050, AMR could cause a **3.8% reduction in global GDP**, pushing up to 28 million people into poverty, with developing nations hit the hardest. As per an estimate by the Global Research on Antimicrobial resistance (GRAM) project, AMR can lead to an economic brunt on the world economy to the tune of US \$1 trillion by 2050.
4. **Threat to Food Security:** AMR in livestock, poultry and aquaculture can affect animal health and productivity and facilitate transmission of resistant organisms through the food chain, making AMR a major **One Health** challenge.

5. **Inequality in Healthcare:** Poorer populations are particularly vulnerable because they may face limited access to diagnostics, quality medicines and specialist care, while resistant infections impose higher treatment costs.
6. **Looming possibility of next pandemic:** There is a looming possibility that the next pandemic will be caused by a superbug. For e.g. Concerns about the spread of C. Auris superbug.

What steps have been taken to control AMR?

Domestic Steps and Actions:

Ban of antimicrobial usage in Agriculture	The Government of India has passed an order banning the use of streptomycin and tetracycline in agriculture and the growth promotional use of colistin in poultry farming.
National Programme on AMR Containment	It was launched during 12th FYP in 2012-17. Under this programme, AMR Surveillance Network has been strengthened by establishing labs in State Medical Colleges.
National Action Plan on AMR (NAP-AMR)	Launched in 2017 , it focuses on awareness, surveillance, infection prevention, rational antimicrobial use, research and international collaboration.
National AMR Surveillance Network (NARS-Net)	NCDC has established a laboratory-based surveillance network to monitor resistance patterns and generate evidence for treatment and policy decisions.
Delhi Declaration on AMR	An inter-ministerial consensus was signed by the ministers of the concerned ministries pledging their support in AMR containment.
Chennai Declaration	New H1 rule was introduced which banned the use of only second and third-line antibiotics. (H1 rule was brought out to regulate over-the-counter use of antibiotics).
Red Line campaign	To prevent irrational use of prescription-only antibiotics and create awareness on the dangers of taking antibiotics without prescription.
Antimicrobial Resistance Strategic Action Plan (KARSAP)	Kerala's state-level Antimicrobial Resistance Strategic Action Plan (KARSAP) serves as a successful model for integrating AMR management into a healthcare system using a "One Health" approach.

Global Steps and Actions:

WHO's Global Action Plan (GAP) on AMR (2015)	WHO launched this comprehensive global action plan to reduce the incidence of AMR by improving awareness and understanding about AMR, optimisation of antimicrobial usage and initiating effective sanitation and hygiene. Adopted globally with five major objectives: awareness, surveillance/research, infection prevention, responsible antimicrobial use and sustainable investment.
Global Antimicrobial Resistance and Use Surveillance System (GLASS)	WHO established GLASS to enable countries to systematically collect and share comparable data on AMR and antimicrobial consumption.
WHO AWaRe Classification	Antibiotics are categorized into three groups: Access (first/second choice), Watch (higher resistance potential), and Reserve (last-resort options) – to guide rational prescription practices globally.
One Health Approach	A joint alliance formed by the WHO , the Food and Agriculture Organization (FAO), the World Organisation for Animal Health (WOAH), and the UN Environment Programme (UNEP) to drive cross-sector action on human, animal, and environmental fronts.

What measures should be adopted to effectively combat & reduce AMR?

AMR is a complex socio-economic and political challenge and not just a scientific issue to be solved by doctors and researchers alone.

1. **Promote Antimicrobial Stewardship:** Ensure antibiotics are prescribed only when necessary, using the right drug, dose and duration. Strengthen hospital antimicrobial-stewardship committees, prescription audits and standard treatment guidelines among healthcare professionals to prevent misuse and resistance.
2. **Strengthen AMR Surveillance:** Expand **NARS-Net** and antimicrobial-consumption surveillance across India and data from humans, animals, food and the environment under a One Health surveillance system. For e.g. NCDC's surveillance of *E. coli*, *Klebsiella* and MRSA helps track resistance trends and guide treatment policies.
3. **Regulate Antimicrobial Use in Animals & Agriculture:** Restrict non-essential antimicrobial use in livestock, poultry and aquaculture. Strengthen veterinary prescription systems and surveillance of antimicrobial consumption in agriculture.
4. **Improvement of Sanitation and Hygiene:** The sanitation in hospitals and basic access to personal hygiene must be improved to reduce the spread of AMR. Improving Clean Water, Adequate Sanitation, and Hygiene infrastructure in low- and middle-income communities cuts off sewage-to-waterway transmission routes.

5. **Implementation of the Chennai Declaration on AMR:** The new H1 rule which banned the use of only second and third-line antibiotic must be implemented at the earliest to prevent the over-the-counter sales of antibiotics.
6. **Investment in Public Health infrastructure:** The investment in public health infrastructure like network of laboratories, hospitals, recruitment of trained medical professionals must be enhanced at the earliest. **For e.g.** NCCD reports points out that states with good public health systems have lower AMR.
7. **Improving governance and monitoring framework:** Environmental governance, planning and regulatory frameworks must be enhanced to combat the menace of AMR. **For e.g.** Involve the Ministry of environment to stop the contamination of antimicrobials.
8. **One Health Approach:** Any actions on AMR must be guided by the 'One Health Approach'- a holistic approach that links the health of humans with our shared environment. Create stronger coordination among MoHFW, NCDC, ICMR, ICAR, FSSAI, environmental authorities and veterinary institutions, with shared data and accountability.
9. **Robust investment in R&D of new antibiotics:** Develop new antibiotics, antifungals, vaccines, diagnostics and alternative therapies. Support genomic surveillance and research into AMR transmission pathways.
10. **Awareness Generation on AMR:** Discourage self-medication and incomplete courses. Expand AMR awareness among doctors, pharmacists, farmers, veterinarians and the public. Peru's efforts on patient education to reduce unnecessary antibiotic prescriptions must be used as a learning point.

Conclusion: The development of resistance to antimicrobials is a major public health problem all over the world. It makes even minor infections tough to treat, causing severe illnesses and deaths. Hence, a clarion call to end this menace must be taken at local, national and global levels that would eventually help in attainment of **SDG 3** (ensuring good health and well-being for all).

Read More: [Indian Express](#)

UPSC Syllabus: GS 3- Science and Technology (Healthcare and emerging concerns)



Anti-Microbial Resistance (AMR)

According to a **report** by Global Research on Antimicrobial resistance (GRAM) project, **AMR** has directly contributed to about **30% of deaths due to neonatal sepsis** across India. Moreover, **over 30% of the COVID-19 deaths in India**, were due to failure to treat secondary bacterial infections caused by Multi Drug Resistant pathogens.



Anti Microbial Resistance

- » **AMR**- Resistance of **microorganisms** (bacteria, virus, parasites and fungi) to an **antimicrobial agent** (antibiotics, fungicides, antiviral agents and parasiticides), to which they were first sensitive
- » **Examples of AMR in India**- Bacteria like **E. coli**, **Klebsiella**, **Acinetobacter** have developed AMR. Third-generation antimicrobial drugs like **cephalosporins**, **imidazoles** have become ineffective



Challenges

- » **Threat to the health care system**- Increase the **mortality rates** in Africa and Asia.
- » **Economic Brunt**- To the tune of **US\$ 1 trillion by 2050** for the world economy.
- » **Looming possibility of next pandemic**- **C. Auris superbug** has raised severe concerns.



Initiatives

- » **Delhi Declaration on AMR**
- » **Red Line campaign**
- » **National programme on AMR containment**
- » **WHO's Global Action Plan (GAP) on AMR, 2015**



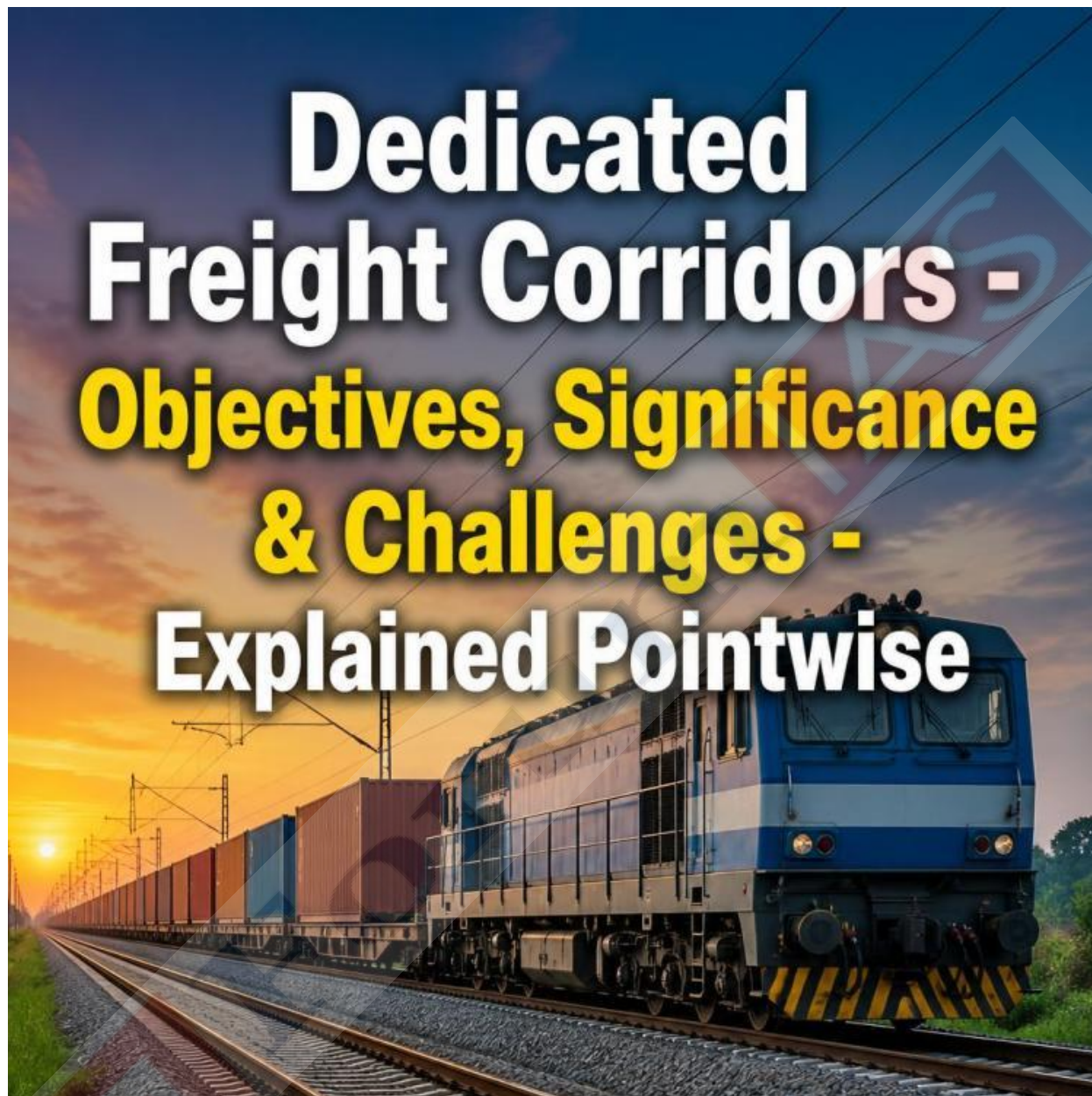
Causes of AMR

- » **Misuse of antimicrobial medicines**- Use of **over-the-counter antibiotics** & Overuse during **Covid-19**
- » **Inadequate healthcare facilities**- Lack of large network of laboratories for **bacterial culture tests** & adequately trained healthcare personnel
- » **Improper usage in agriculture and allied sectors**- Use of **Colistin** as growth promotional agent in poultry farming
- » **Crony capitalism**- Pharmaceutical industry **incentivising** the sale of antibiotics
- » **No new antimicrobial development**- **Exit of big pharma** from antibiotic development
- » **Inadequate sanitation facilities**- **Candida auris** acquired by hospital patients



Way Forward

- » **Chennai Declaration on AMR**- Implement **new H1 rule** which bans the use of only second and third-line antibiotic.
- » **One Health Approach**- Reduce use of **biopesticides** and **fungicides** in agriculture.
- » **Awareness Generation**- **Peru's efforts** on patient education
- » **R&D of new antibiotics**- Use of **AMR Fund** for support

Dedicated Freight Corridors - Objectives, Significance & Challenges - Explained Pointwise

Recently, Prime Minister Narendra Modi inaugurated three key sections of the Western Dedicated Freight Corridor (WDFC), marking another milestone in strengthening India's freight infrastructure. The development is expected to enhance logistics efficiency, reduce transit time and costs, and improve connectivity between industrial centres and major ports.

What is a Dedicated Freight Corridor (DFC)?

- A Dedicated Freight Corridor (DFC) is a specially designed railway route meant exclusively for the movement of freight/goods trains, separating freight traffic from passenger trains on busy railway routes.

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- In India, the government proposed building DFCs along the Golden Quadrilateral in 2005. Dedicated Freight Corridor Corporation of India Limited (DFCCIL) was set up in 2006 to construct and operate DFCs.
- The two major dedicated freight corridors are:
 1. **Eastern DFC:** From Ludhiana (Punjab) to Dankuni (West Bengal).
 2. **Western DFC:** From Dadri (Uttar Pradesh) to Jawaharlal Nehru Port Trust (JNPT) near Mumbai.
- Four further dedicated freight corridors are being developed:
 1. **East-West Corridor** (2327 km): Kolkata–Mumbai
 2. **North-South Corridor** (2328 km): Delhi–Chennai
 3. **East Coast Corridor** (1114 km): Kharagpur–Vijayawada
 4. **Southern Corridor** (892 km): Madgaon–Chennai



DEDICATED FREIGHT CORRIDORS OF INDIA

Source: Wikipedia

What are its basic objectives?

1. **Decongest existing railway network:** DFCs divert freight trains from congested routes, freeing railway capacity for faster, more efficient passenger services.

2. **Increase freight-carrying capacity:** DFCs provide dedicated, high-capacity railway lines, enabling faster movement of heavier and longer freight trains and reducing congestion on existing routes.
3. **Reduce logistics costs:** Dedicated Freight Corridors reduce transportation time, fuel consumption and freight handling costs, thereby lowering overall logistics costs and improving supply-chain efficiency.
4. **Improve transit speed:** Dedicated freight tracks enable faster movement of goods by reducing congestion, improving train speeds (from ~25 km/h to 75–100 km/h), and ensuring smoother, more reliable freight transportation.
5. **Promote modal shift:** The corridors are designed to carry much heavier loads and can replace a large number of trucks. This shift from road to rail helps decongest highways, reduces road accidents, and lowers carbon emissions, contributing to a more sustainable and greener logistics network.
6. **Boost Economic and Industrial Growth:** By providing a fast, reliable, and cost-effective link between industrial hubs and major ports (like JNPT in Mumbai), DFCs are expected to stimulate economic growth, enhance supply chain efficiency, and make Indian exports more competitive.

What is the significance of Dedicated Freight Corridors for India's logistics sector?

1. **Lowering India's Overall Logistics Cost:** Historically, logistics costs accounted for 13-14% of India's GDP. High-capacity rail movement helps drive the logistic cost below 8%, making Indian manufacturing and exports far more price-competitive globally.
2. **Drastic Reduction in Transit Times:** Cargo trains on standard lines average 25 km/h due to passenger priority. On DFCs, average speeds increase to 50-60 km/h with top speeds of 100 km/h, cutting transit times by 50% or more on key trunk routes (e.g. JNPT/Mundra ports to the Delhi-NCR hinterland).
3. **Double-Stack Containerization:** Overhead clearances on the Western DFC allow double-stack container trains, effectively doubling the cargo volume per run.
4. **Longer, Heavier Trains:** Standard tracks handle ~5,000 tonnes per train. DFCs accommodate heavy-haul trains up to 1.5 km long, carrying up to 13,000 tonnes. This drastically reduces freight cost per tonne-kilometer.
5. **Modal Shift from Road to Rail:** Moving freight via roadways is 2.5× more expensive per tonne-kilometer than long-haul rail and creates severe highway congestion. DFCs offer reliable schedules that allow companies to switch from trucks back to rail, targeting a national goal of a 45% rail freight modal share.
6. **Multi-Modal Integration:** DFCs act as the infrastructure anchor for the [PM Gati Shakti](#) program, connecting hinterland inland container depots (ICDs) directly to major sea ports (e.g. JNPT, Mundra, Pipavav).
7. **Industrial Growth:** By connecting inland industrial hubs directly to major ports like JNPT in Mumbai, DFCs are enabling the creation of new industrial corridors. DFCs serve as the backbone for mega-industrial hubs like the Delhi-Mumbai Industrial Corridor (DMIC). For e.g. Western DFC supports industrial growth around Gujarat, Rajasthan and Maharashtra through better port connectivity.
8. **Environmental Impact:** DFCs operate on 100% electrified lines featuring regenerative braking. Shifting bulk freight from diesel trucks to electric rail prevents millions of tonnes of carbon emissions annually, aligning with India's Net-Zero targets.

What are the major challenges in the development and operation of Dedicated Freight Corridors in India?

1. **Land acquisition delays:** Delays in acquiring land due to compensation disputes, rehabilitation concerns, legal challenges and fragmented ownership increase project costs and postpone timely

completion of DFC projects. For e.g. about **11,000 hectares** of land had to be acquired for the initial corridors, which involved removing structures and dealing with encroachments.

2. **Farmer Protests:** The project has triggered opposition from affected communities. In Gaya, Bihar, farmers have protested, claiming the construction of the Eastern DFC threatens irrigation for nearly 2,200 acres of farmland, which could render their fertile land barren.
3. **Cost and Time Overruns:** The original cost estimates, sanctioned during 2006–08, increased significantly due to inflation, rising land acquisition costs and implementation delays. The project took over 15 years to substantially complete, far exceeding the initial 5-7 year timeline.
4. **Speed Concerns:** The average speed of freight trains on the DFC network in 2024-25 was reported as 37 km/h. While this is a significant improvement over the 23.8 km/h on the conventional network, a parliamentary panel noted that there is “considerable scope for further enhancement”.
5. **Complex terrain and engineering challenges:** DFC construction involves difficult terrain, major bridges, tunnels and river crossings, increasing engineering complexity, construction time, costs and technical requirements.
6. **First- and Last-Mile Connectivity:** A lack of robust connectivity to and from the DFC terminals is a major structural constraint. If goods cannot be efficiently moved from a factory to the DFC or from the DFC to a warehouse, the overall logistics efficiency is hampered.
7. **Coordination issues:** Delays may arise due to coordination gaps among Indian Railways, DFCCIL, state governments, ports and private logistics operators, affecting timely project execution and efficient operations.
8. **Limited Private Sector Participation:** Freight operations and rolling-stock investment remain heavily reliant on Indian Railways and public funding. Limited participation under private freight train operator schemes has constrained investment diversification, competition and innovation.
9. **Crew Shortages:** Dedicated Freight Corridor Corporation of India Limited (DFCCIL) relies on Indian Railways for operational staff. Significant vacancies in sanctioned roles for loco pilots, station masters, and goods train managers create operational constraints and limit maximum throughput.
10. **Environmental and social concerns:** Large linear infrastructure projects raise concerns around displacement, resettlement of affected communities, and environmental clearances, particularly where corridors pass through ecologically sensitive or densely populated zones.

What should be the way forward?

1. **Massive Recruitment & Training:** The most immediate threat to the DFC network's efficiency is the severe shortage of trained operational staff, especially loco pilots and goods train managers (guards). A parliamentary committee has urged the Railways to urgently resolve this shortage to minimize delays and improve throughput. This requires a major, accelerated recruitment and training drive to fill the existing vacancies.
2. **Expedite Remaining Corridor Development:** Fast-track planning and execution of the proposed East-West (Kolkata-Mumbai), North-South (Delhi-Chennai), East Coast (Kharagpur-Vijayawada), and Southern corridors to realize a truly pan-India freight network, learning from land acquisition and execution lessons of the Eastern/Western DFCs.
3. **Enhance First- and Last-Mile Connectivity:** Strengthen connections between DFCs and ports, industrial clusters, logistics parks, warehouses and highways through feeder rail lines and efficient road links. This will reduce cargo handling, trans-shipment delays and overall logistics costs, ensuring seamless first-mile-to-last-mile freight movement.
4. **Promote private-sector participation:** Encourage greater private investment in freight terminals, rolling stock, logistics parks and train operations through transparent PPP frameworks, predictable

regulations, competitive access to DFC infrastructure and viability-gap funding where necessary. This can reduce dependence on public financing while promoting competition, efficiency and innovation.

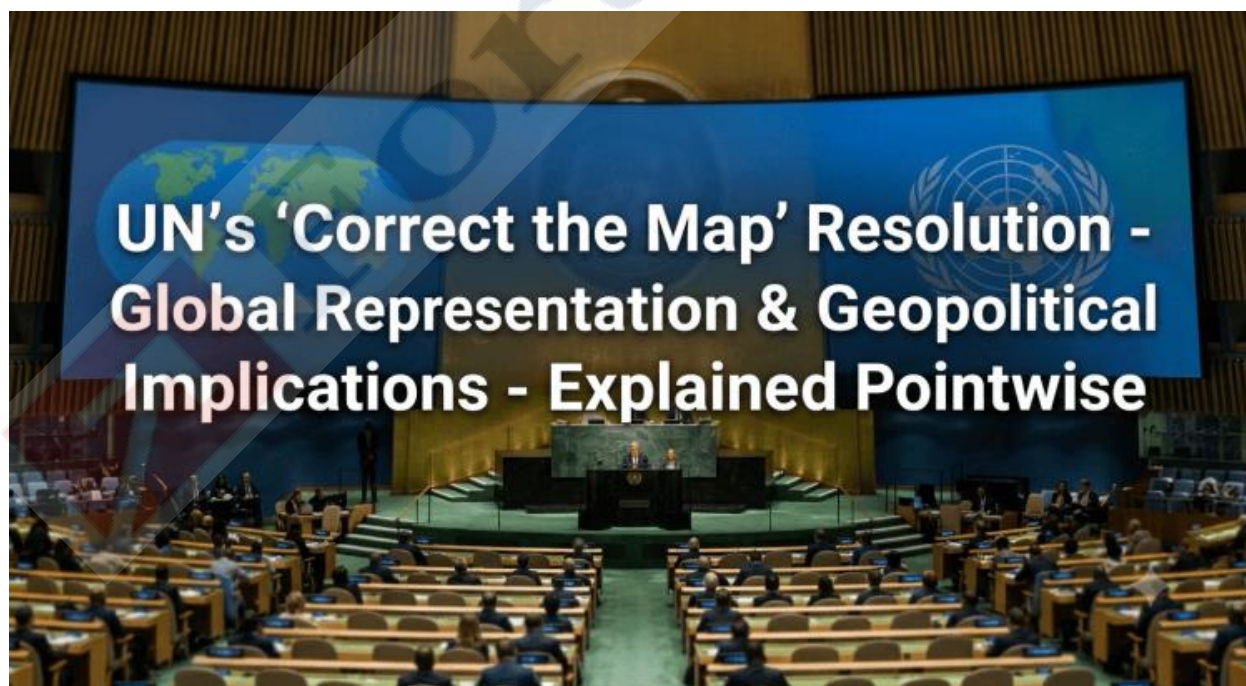
5. **Enhance capacity utilisation:** Maximise DFC usage by diversifying freight beyond coal and bulk commodities towards **containers, automobiles, agricultural produce, cement and manufactured goods**. Better integration with ports, industrial clusters and logistics parks can ensure higher and more consistent freight volumes.
6. **Create competitive freight markets:** Encourage greater private participation in freight train operations, rolling-stock ownership and terminal management through transparent regulations, competitive access to DFC infrastructure, stable tariffs and simplified licensing, promoting efficiency, innovation and better service quality.
7. **Address social and environmental concerns:** Ensure environmentally sustainable and socially inclusive construction by conducting rigorous environmental impact assessments, minimising forest and agricultural land diversion, restoring habitats, and providing fair compensation, rehabilitation and livelihood support to affected communities.

Conclusion: Dedicated Freight Corridors can transform India's logistics ecosystem by **reducing freight costs, improving connectivity, promoting multimodal transport and shifting cargo towards railways**. Their success will depend on timely execution, private participation, environmental sustainability and seamless integration with **PM Gati Shakti**.

UPSC GS-3: Indian Economy (Infrastructure)

Read More: [The Hindu](#)

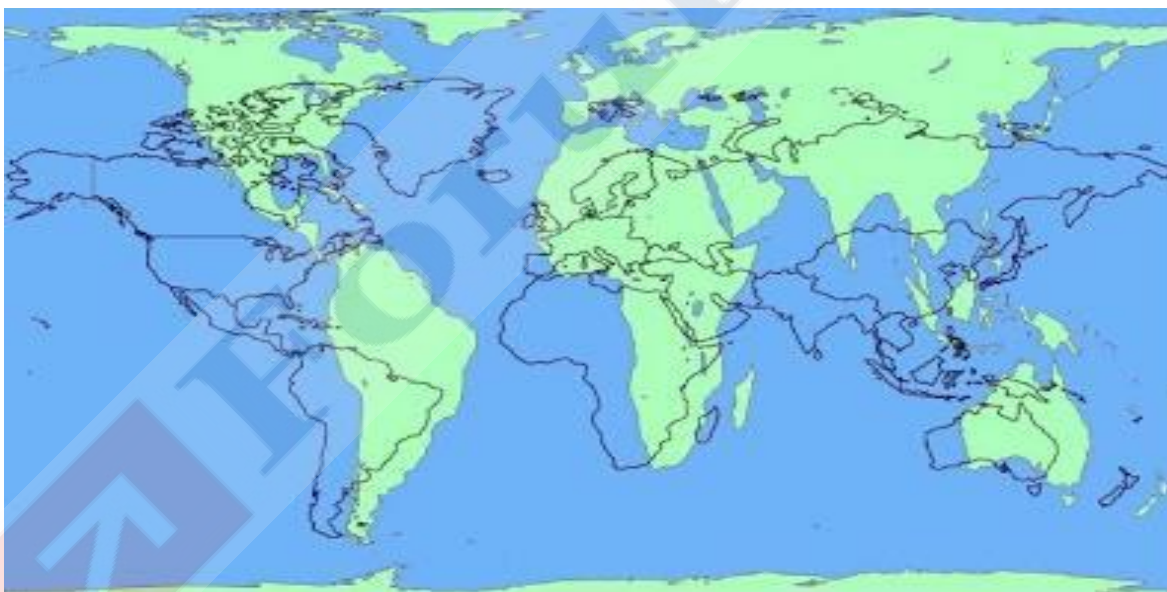
UN's 'Correct the Map' Resolution – Global Representation & Geopolitical Implications – Explained Pointwise



Recently, the UN General Assembly adopted the “**Correct the Map: Rebalancing Global Cartographic Representation**” resolution, encouraging governments, educational institutions, international organisations and technology companies to consider equal-area map projections, such as Equal Earth, when accurately representing the relative size of continents is important. The **non-binding resolution** does not prohibit the use of the Mercator projection. It was adopted by a recorded vote of **164 in favour, 1 against (the United States), and 6 abstentions** (Estonia, Georgia, Lithuania, Moldova, Serbia and Ukraine).

What is the Mercator projection?

- The Mercator projection is a cylindrical map projection developed by **Gerardus Mercator in 1569**. It preserves **direction and angles**, making it highly useful for navigation, but it significantly distorts the **size and shape of landmasses**, especially near the poles.
- On a Mercator map:
 - **North-south distances are stretched** increasingly as you move away from the equator.
 - **East-west distances are stretched by the same factor** at each latitude, so that local shapes and compass bearings are preserved.
 - **Lines of constant compass bearing (rhumb lines)** appear as straight lines, which is why it became the standard navigational map for centuries.
- The key mathematical idea is that the vertical scale is made to match the horizontal scale at every latitude. Since the horizontal scale grows as you move toward the poles (because lines of longitude converge on a globe but are drawn parallel on the map), the vertical scale must grow too.



What are the implications of the Mercator projection's distortion of the relative size of continents and countries?

1. **Distorted perception of size:** The Mercator projection exaggerates areas near the poles while shrinking equatorial regions. For e.g. **Greenland** appears comparable to **Africa**, although Africa is nearly 14 times larger, **Alaska** looks comparable in size to Brazil, but Brazil is nearly **5 times larger**, **Antarctica**, which is actually smaller than South America, appears as a vast band stretching across the bottom of the map.

2. **Reinforcement of Eurocentric perceptions:** The Mercator projection visually enlarges Europe and North America while reducing the apparent size of equatorial regions, potentially reinforcing perceptions of Western regions as geographically dominant and more globally significant.
3. **Under-representation of the Global South:** Mercator's area distortion makes many equatorial countries in Africa, Asia and South America appear smaller than their actual size, potentially creating a misleading perception of their geographical significance compared with high-latitude regions. For e.g. Africa is often perceived as similar in size to North America, despite being larger than North America and China combined.
4. **Colonial legacy:** The widespread use of the Mercator projection during the European colonial era contributed to a Eurocentric representation of the world. By visually enlarging Europe and other high-latitude regions while reducing equatorial regions, it has been criticised for reinforcing perceptions of Western geographical and political dominance.
5. **Inaccurate Geographical Literacy:** Decades of classroom reliance on standard wall maps have left generations with persistent false assumptions. Common misconceptions include believing Greenland is as large as Africa (Africa is 14 times larger) or that Europe is larger than South America (South America is nearly double Europe's size).
6. **Distorted Scale of Global Issues:** Problems like tropical deforestation, disease spread, or resource allocation are mapped onto diminished spatial footprints, making equatorial land areas seem less extensive than they are in reality.
7. **Influence on geopolitical perceptions:** Mercator's distortion may make high-latitude regions appear disproportionately large, potentially shaping perceptions of their geographical importance and reinforcing Eurocentric worldviews. Maps can therefore subtly influence how global power and regional significance are perceived.

What is the significance of the UN's recent "Correct the Map" resolution?

1. **Corrects geographical distortions:** Promotes the use of **equal-area projections** that depict the relative size of continents and countries more accurately. This reduces the exaggerated appearance of high-latitude regions and gives a more realistic representation of landmasses, such as **Africa, South America and India**.
2. **Improves representation of Africa:** The resolution promotes equal-area maps that depict Africa closer to its actual geographical size, countering the significant underrepresentation created by Mercator projection. This can improve geographical awareness of Africa's place in the world.
3. **Challenges Eurocentric perceptions:** The resolution seeks to reduce the historical influence of cartographic representations that may have reinforced perceptions of Western regions as disproportionately large or important.
4. **Promotes Global South perspectives:** The initiative gives greater visibility to the geographical realities of **Africa, Asia and Latin America**, whose actual size is often understated in Mercator maps. It encourages a more balanced understanding of the world and challenges historically dominant Eurocentric representations.
5. **Educational significance:** The "Correct the Map" initiative can promote **greater geographical literacy** by helping students understand that different map projections involve different types of distortions. It can encourage critical thinking about how maps influence perceptions of **size, location and global importance**, while providing a more accurate representation of continents such as Africa and South America.
6. **Links cartography with power:** Maps are not purely neutral geographical tools; they can shape how people perceive territory, size, importance and global power. Thus, cartographic choices can reflect and sometimes reinforce historical power structures and dominant worldviews. The UN's "Correct the

Map” initiative highlights the importance of more balanced and accurate geographical representation, particularly for the Global South.

7. **Promotes informed use of maps:** The resolution encourages users to understand that every map projection involves trade-offs. It promotes choosing projections according to purpose (equal-area maps for comparing geographical size and Mercator for navigation) thereby preventing misleading interpretations of geography.

What is India’s position on the UN’s “Correct the Map” initiative and its concerns regarding territorial representation?

India **voted in favour** of the UN General Assembly’s “Correct the Map” resolution, supporting the broader principle of equal-area cartographic representation. However, India clarified that its vote does not constitute endorsement of any particular map projection or map depicting national boundaries.

India’s position:

- **Supports accurate representation:** India supports the objective of reducing distortions in the relative size of continents and promoting more equitable cartographic representation.
- **No endorsement of a specific projection:** India clarified that the resolution does not endorse the Equal Earth projection specifically. Different projections serve different purposes, and no single projection is suitable for every application.

India’s concerns:

- **Objects to misleading representations:** India stated that any **inaccurate or misleading depiction** of its territory is unacceptable.
- **Territorial integrity remains non-negotiable:** India stressed that its sovereign territory, including the Union Territories of Jammu & Kashmir and Ladakh, must be depicted in accordance with India’s official map.

Conclusion: The resolution is significant because it goes beyond cartography. It seeks to promote greater geographical accuracy, inclusiveness and awareness of how maps can shape perceptions of the world.

UPSC GS-1: Geography, GS-2: International Relations

Read More: [Indian Express](#)

The infographic is divided into four quadrants around a central title. The top-left quadrant shows a city skyline with flags of Brazil, Russia, India, China, and South Africa, along with a green upward-trending arrow and gears, labeled 'CRA'. The top-right quadrant shows a hand pointing at a map of India, a dollar sign with a red 'X', a pie chart, and a bar chart with a downward arrow labeled 'TARIFFS', with the text 'local currencies' below. The bottom-left quadrant shows a hand pointing at a globe, a rising sun, and a handshake, labeled 'CRA'. The bottom-right quadrant shows a factory with smoke, a broken chain link, and gears, with the text 'delays' below. The central title is 'BRICS - Significance & Challenges - Explained Pointwise'.

What is BRICS?

- ### Origin & Evolution:

2001	Economist Jim O'Neill (Goldman Sachs) coined the term "BRIC" in a 2001 report titled <i>Building Better Global Economic BRICs</i> to describe emerging markets that could become increasingly important in the global economy.
2006	The four countries began formal political cooperation in 2006 , when their foreign ministers met on the sidelines of the UN General Assembly in New York.
2009	The first summit of BRIC leaders was held in Yekaterinburg, Russia , in 2009. The grouping began focusing on: 1. Reform of global financial institutions 2. Greater voice for developing countries 3. International economic cooperation 4. Multilateralism and global governance
2010	South Africa joined BRIC in 2010 , transforming the grouping into BRICS . Its participation strengthened the group's representation of the African continent and Global South .
2014	At the 2014 Fortaleza Summit in Brazil , BRICS established two important institutions: 1. New Development Bank (NDB): Headquartered in Shanghai to fund infrastructure projects 2. Contingent Reserve Arrangement (CRA): A framework to mitigate short-term balance-of-payments pressures.
2023	At the 2023 Johannesburg Summit , BRICS decided to expand its membership and invited several countries to join. In 2024 : Iran, Egypt, Ethiopia, and the United Arab Emirates attended their first summit as member states in 2024 in Russia. In 2025 : Indonesia officially joined as a member state, becoming the first Southeast Asian member.

What are the OBJECTIVES of BRICS?

1. **Promote Economic Cooperation:** BRICS seeks to deepen economic ties among member countries by increasing intra-BRICS trade and investment, facilitating business cooperation, promoting infrastructure and development financing, and strengthening coordination on global economic issues. It also encourages greater use of local currencies and alternative payment mechanisms to reduce transaction costs and vulnerability to external financial shocks.
2. **Reform Global Governance:** BRICS act as a pressure group for a more inclusive, equitable, and representative multipolar international system. This includes pushing for reforms in international

financial institutions like the World Bank and IMF, and the United Nations Security Council, to better reflect the interests of emerging economies and developing countries.

3. **Strengthen Global South Cooperation:** BRICS provides a platform for emerging markets and developing countries (also known as **Global South**) to assert their influence on the international stage and address common challenges like climate finance, sustainable development, and access to technology.
4. **Reduce Reliance on Western Institutions and Currencies:** Explore alternative mechanisms for trade and finance, including increasing trade in local currencies and developing their own financial institutions, to reduce dependence on the U.S. dollar and Western-dominated financial systems.
5. **Support Infrastructure & Development:** BRICS promotes infrastructure financing in developing countries through the **New Development Bank (NDB)**, which funds projects in areas such as transport, renewable energy, water & sanitation, urban infrastructure and digital connectivity. This helps address infrastructure gaps and supports sustainable and inclusive economic growth.
6. **Cooperate on Global Challenges:** BRICS provides a platform for member countries to coordinate their positions and undertake joint action on major global challenges such as climate change, pandemics, terrorism, food and energy insecurity, and sustainable development.

What are the KEY INITIATIVES of BRICS?

1. **Alternative financial systems:**
 - a. **New Development Bank (NDB):** Finances infrastructure and sustainable-development projects in member and other developing countries. It provides an alternative source of development finance alongside institutions such as the World Bank.
 - b. **Contingent Reserve Arrangement (CRA):** CRA is a \$100 billion financial safety mechanism designed to provide liquidity support to BRICS members facing balance-of-payments pressures and short-term external financial difficulties.
 - c. **Local Currencies Trade Settlement and De-dollarization:** A proposal to introduce BRICS-PAY which aims to create a shared cross-border payment platform that would link national fast-payment networks and potentially support central bank digital currency (CBDC) transfers, facilitating seamless and potentially dollar-free transactions among members.
2. **BRICS Business Council:** Established in 2013, it promotes **business-to-business cooperation**, trade, investment and private-sector partnerships among BRICS countries.
3. **Global Value Chains (GVC) Action Plan:** Frameworks aimed at easing customs procedures, reducing trade tariffs within the bloc, and mapping critical mineral and industrial supply chains to withstand Western market disruptions.
4. **BRICS Anti-Terrorism Strategy:** Members cooperate on counter-terrorism efforts, including intelligence sharing, capacity building, and preventing the financing of terrorism.
5. **BRICS Initiative on Denial of Safe Haven to Corruption:** Aims to improve anti-corruption cooperation and build anti-corruption capabilities through training and education.
6. **BRICS Partnership for the Elimination of Socially Determined Diseases:** A recent initiative aimed at addressing health challenges disproportionately affecting vulnerable populations.
7. **Unilateral Economic Sanctions:** BRICS openly condemned such sanctions.

What is the SIGNIFICANCE of BRICS?

1. **Economic Influence:**
 - **Share of Global GDP:** On a purchasing power parity basis, BRICS economies accounted for **almost 40% of global GDP in 2024**, compared to approximately **29% for the G7**.

- **Demographic and Trade Footprint:** The expanded grouping represents **49.5% of the world's population** and **26% of global trade**. Their share of global merchandise exports **doubled from 12% to 24%** between 2003 and 2024.
 - **Intra-BRICS Trade:** Trade among members surged **more than 13-fold, from \$84 billion in 2003 to \$1.17 trillion in 2024**.
2. **Reforming Global Governance:** BRICS advocates for expanding the **UN Security Council** to include permanent seats for India and Brazil, and pushing for reforms at the **IMF and World Bank** to reflect current economic realities.
 3. **Platform for Global South (South-South Cooperation):** BRICS has expanded to include more countries from Africa, the Middle East, and Asia, amplifying the voice of developing nations in global affairs and addressing issues like inequality and under-representation in institutions like UNSC.
 4. **Alternative International Financial Institutions:** The creation of institutions like the New Development Bank (NDB) and the Contingent Reserve Arrangement (CRA) provides alternative financial mechanisms for development and stability, reducing reliance on Western-dominated bodies and the US dollar.
 5. **De-dollarization Push:** BRICS is working on interoperable digital payment architectures and national-currency trade to reduce reliance on the US dollar, giving member states greater financial autonomy.
 6. **Addressing Global Challenges:** BRICS provides a forum for members to coordinate positions on critical global and regional security issues, including counter-terrorism, cybersecurity, and peace and stability in various conflict zones. For e.g. 2025 BRICS Summit criticized Pahalgam Terrorist Attack, as well as, bombing of Iran's nuclear sites by USA.

What are the CHALLENGES faced by BRICS?

1. **Diverse Political Systems and Ideologies:** BRICS comprises a mix of democracies (India, Brazil, South Africa, potentially Indonesia, Egypt) and authoritarian states (China, Russia, Iran). This fundamental difference in political systems can lead to divergent approaches on human rights, governance, and international norms, making it challenging to forge a unified stance on all geopolitical issues.
2. **China's Dominance:** China's economy is significantly larger than all other BRICS members combined, creating an imbalance. There are concerns among other members, particularly India, about Beijing's overwhelming influence and its "predatory" economic practices or debt diplomacy.
3. **Varying Economic Structures:** Members have different economic structures (e.g. **commodity exporters** like Russia, Brazil, Saudi Arabia, UAE; **manufacturing hubs** like China; **service and IT hubs** like India). This can lead to conflicting trade interests and priorities.
4. **Limited Intra-BRICS Trade:** Despite BRICS representing a large share of the global economy and population, trade among its members remains below its potential. Differences in tariffs, regulations, standards, logistics, payment systems and geographical distance create barriers to deeper economic integration. India-China trade, for instance, is substantial but marked by a significant trade imbalance.
5. **Bilateral Tensions Among Members:** The ongoing border disputes and geopolitical rivalry between India and China are a major underlying tension. The recent expansion has brought in countries with existing regional rivalries (e.g. **Saudi Arabia vs. Iran, Egypt vs. Ethiopia** over the Nile River). Managing these tensions while fostering cooperation will be a delicate balancing act.
6. **"Asian NATO" Label:** Western nations, particularly the US, often view BRICS (and especially its expansion) as an attempt to form an "anti-Western" or "anti-American" bloc, akin to an "Asian NATO." This narrative can lead to increased geopolitical tensions.

7. **Russia-West Conflict:** The Russia-Ukraine conflict and resulting tensions between Russia and Western countries have created challenges for BRICS by introducing geopolitical divisions within the grouping. Western sanctions on Russia also complicate trade, investment, banking and payment transactions involving BRICS members. Different members have adopted different positions on the conflict, making consensus on major international issues difficult.
8. **Tariff Threats and Economic Coercion:** Last year, US President Donald Trump's threatened the BRICS countries to impose tariffs & other economic sanctions if they are perceived to be aligning against Western interests or undermining the US dollar.
9. **Informal Structure:** BRICS operates as an informal grouping without a binding treaty or a permanent secretariat (beyond the NDB). While this allows flexibility, it can also lead to a lack of institutional coherence and consistent implementation of decisions.
10. **Expansion-Related Challenges:** The expansion of BRICS has increased its geographical and economic diversity. A larger membership can make consensus-building, coordination and decision-making more complicated.

What can be the WAY FORWARD?

1. **Focus on Shared Economic and Development Goals:** While political ideologies differ, members generally agree on the need for economic development, poverty alleviation, and sustainable growth. Prioritizing cooperation on these tangible goals (e.g. green infrastructure, digital transformation, food security) can build trust and common ground.
2. **Fairer Intra-BRICS Trade:** Develop mechanisms to address trade imbalances, particularly with China. This could involve promoting diversification of imports/exports among members, encouraging joint ventures, and investing in less developed BRICS economies.
3. **Strengthening the NDB's Role:** The New Development Bank (NDB) must continue to expand its lending in local currencies and prioritize projects that benefit all members, especially the smaller and newer ones, thereby fostering a sense of shared economic benefit and reducing dependence on any single dominant economy within the bloc.
4. **Formalizing Decision-Making:** While maintaining its informal nature, BRICS could explore mechanisms to streamline decision-making and ensure commitments are followed through. This could involve a small, dedicated secretariat for coordination beyond annual summits.
5. **Manage Expansion Effectively:** With a larger membership, BRICS should establish clear membership criteria, decision-making procedures and institutional structures to maintain efficiency and cohesion.
6. **Pragmatic Multilateralism Over Anti-Western Rhetoric:** BRICS should avoid evolving into an explicitly anti-Western bloc and instead pursue pragmatic, issue-based cooperation. Members have different relationships with the US, EU and other Western institutions; therefore, a confrontational approach could undermine BRICS' cohesion and global appeal.
7. **Strategic De-dollarization:** BRICS countries can move towards de-dollarization by introducing certain steps in incremental manner:
 - a. **Expand Bilateral Trade in Local Currencies:** Continue to promote and expand bilateral trade settlement in national currencies among members.
 - b. **Develop BRICS PAY:** Accelerate the development and implementation of the BRICS PAY system and other digital payment platforms to facilitate efficient cross-border transactions in local currencies.
 - c. **NDB Lending in Local Currencies:** The NDB should continue to prioritize and expand its lending in local currencies, providing a significant boost to their internationalization.

- d. **Explore Basket of Currencies (like R5):** The idea of a unit of account based on a basket of BRICS currencies (like the proposed "R5") could be explored as a precursor to a common currency, serving as a reference point for trade and a potential store of value.

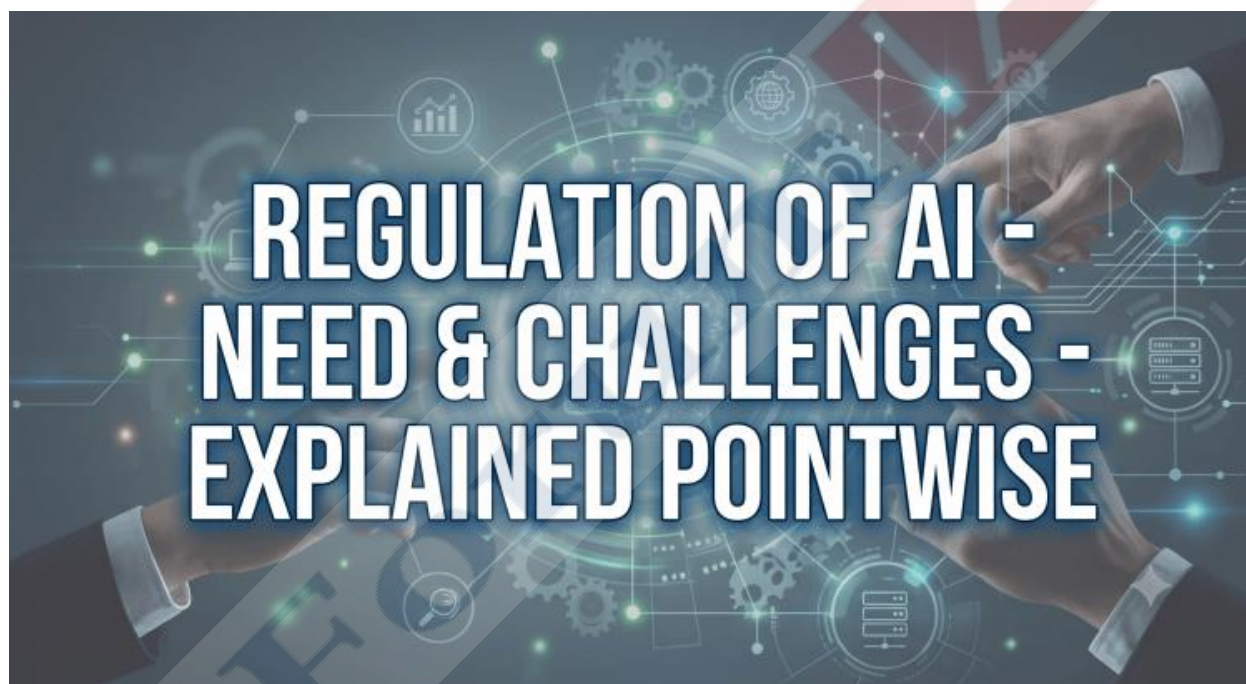
CONCLUSION:

BRICS is an important institution to challenge the **western dominated forums** & for providing an alternative idea of global governance. By systematically addressing the challenges that it is facing through cooperation, institutional strengthening, and strategic positioning, BRICS can solidify its role as a significant and constructive force in shaping a more inclusive and multipolar global order.

Read More: [The Indian Express](#), [Wikipedia](#)

UPSC GS-2: International Relations

Regulation of AI – Need & Challenges – Explained Pointwise



Calls for regulation of Artificial Intelligence has emerged stronger than ever with the recent rise in the cases of misuse of AI like proliferation of deepfakes. With the rapid advancement of AI and its potential impact on society, there is a growing consensus among experts that regulation is necessary to ensure responsible and ethical use of AI technology.

What is the need for regulation of AI?

1. **Bias and discrimination:** AI systems can inherit biases from the data they are trained on, leading to discriminatory outcomes. For e.g. Facial recognition algorithms have been shown to have higher error rates for women and people with darker skin tones.
2. **Lack of transparency:** Many AI algorithms operate as black boxes, making it difficult to understand how they reach their decisions. For e.g. Medical AI system recommending a specific medical treatment but cannot explain its reasoning.

3. **Privacy and data protection:** AI systems rely on vast amounts of personal data, raising concerns about privacy and data protection. For e.g. Lawsuits against Silicon Valley giants for data and privacy breach in their AI systems.
4. **Security risks:** AI systems can be vulnerable to cybersecurity threats and attacks. For e.g. Adversarial attacks can manipulate AI models posing risks in critical domains such as autonomous vehicles or healthcare.
5. **Ethical considerations:** AI raises ethical questions related to the impact on jobs, social inequality, and concentration of power. For e.g. automated decision-making in hiring processes have shown to perpetuate existing biases and result in unfair outcomes.
6. **Artificial General Intelligence:** AGI can self-learn and go beyond human intelligence, raising concerns of predictability and security.
7. **Autonomous Weapons Development:** These machines have the potential to make life-and-death decisions without direct human intervention, leading to ethical dilemma regarding the value of human life.
8. **Mass State Surveillance:** AI, equipped to conduct facial recognition and analyze extensive data, will empower governments to maintain round-the-clock profiles of citizens. This will make dissenting against governments difficult.
9. **Challenges associated with Deepfakes generated using AI:** There are concerns about women safety (morphed pornographic material), liar's dividend (an undesirable truth is dismissed as fake news) and fuelling radicalisation and violence (Fake videos showing armed forces committing 'crimes in conflict areas').

Read More- [Deepfakes- Explained Pointwise](#)

What are the challenges in regulation of AI?

1. **Defining AI:** Defining Artificial Intelligence is challenging because AI encompasses a broad and continuously evolving range of technologies, from simple rule-based systems to advanced generative and autonomous models. A narrow definition may quickly become outdated, while an overly broad one could unintentionally regulate ordinary software.
2. **Rapid technological advancement:** AI technologies are evolving at an unprecedented pace, with capabilities improving faster than traditional legislative and regulatory processes. Generative AI, autonomous systems and multimodal models are creating new risks and applications before regulators can fully understand their implications. Consequently, laws may become outdated soon after they are enacted, creating regulatory gaps and uncertainty.
3. **Balancing innovation and regulation:** AI regulation faces the challenge of protecting society from potential harms without stifling technological innovation. Overly stringent regulations can increase compliance costs, discourage start-ups and research, and reduce investments in emerging technologies. Conversely, inadequate regulation can allow privacy violations, algorithmic discrimination, misinformation and unsafe AI applications.
4. **Increased costs and competition:** AI regulation may impose higher compliance costs on businesses, particularly start-ups and small enterprises. Companies may need to invest in data governance, cybersecurity, audits, documentation, testing and human oversight to meet regulatory requirements. This could increase the cost of developing and deploying AI systems.
5. **Accountability and liability:** AI systems can make or influence decisions that significantly affect individuals, yet determining who should be held responsible when an AI system causes harm is often

difficult. Developers, technology companies, deployers and end-users may all contribute to the outcome.

6. **International cooperation:** AI transcends national borders, making unilateral regulation insufficient. Developing consensus among different countries with varying interests and priorities is a complex task.

What is the status of regulation of AI in India and across the globe?

INDIA	1. Digital Personal Data Protection Act, 2023: Provides the broader framework for protection and processing of personal data, which is particularly relevant to data-intensive AI systems. The DPDP Rules, 2025 were notified in November 2025, operationalising the framework. 2. IndiaAI Mission: Focuses on developing AI compute capacity, datasets, indigenous AI capabilities, skills and responsible AI. 3. AI Governance Guidelines: The India AI Governance Guidelines is the country's first formal, comprehensive blueprint for how AI should be developed and used. Rather than proposing a brand-new overarching AI law immediately, the Guidelines adopt a lighter-touch, flexible regulatory strategy. They rely on existing laws (like the Information Technology Act, 2000 and Digital Personal Data Protection Act, 2023) and propose targeted amendments where necessary. 4. National AI Programme: India has established a National AI Programme to promote the efficient and responsible use of AI. 5. National Data Governance Framework Policy: India has implemented a National Data Governance Framework Policy to govern the collection, storage, and usage of data, including data used in AI systems. This policy will help ensure the ethical and responsible handling of data in the AI ecosystem. 6. Draft Digital India Act: The Ministry of Information Technology and Electronics (MeitY) is working on framing the draft Digital India Act, which will replace the existing IT Act. The new Act will have a specific chapter dedicated to emerging technologies, particularly AI, and how to regulate them to protect users from harm.
REST OF THE WORLD	1. European Union: The EU AI Act is currently the world's most comprehensive dedicated AI regulatory framework. The Act entered into force in 2024 and is being implemented progressively. The EU has also introduced requirements for identifying certain AI-generated content and deepfakes, helping users distinguish synthetic content from authentic content. 2. United States: The White House Office of Science and Technology Policy has published a non-binding Blueprint for the Development, Use, and Deployment of Automated Systems (Blueprint for an AI Bill of Rights), listing principles to minimize potential harm from AI. 3. Japan: Japan's approach to regulating AI is guided by the Society 5.0 project, aiming to address social problems with innovation. 4. China: China has established the "Next Generation Artificial Intelligence Development Plan" and published ethical guidelines for AI. It has also introduced specific laws related to AI applications, such as the management of algorithmic recommendations.

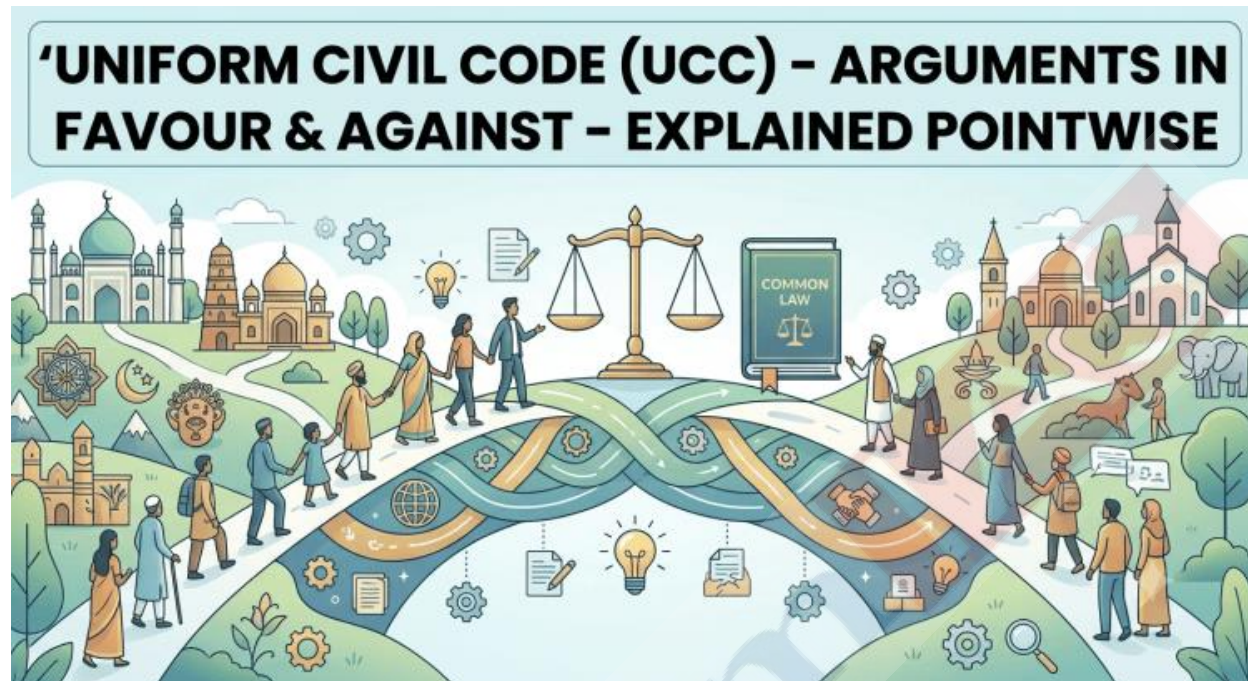
What should be the way forward?

1. **Adopt a risk-based framework:** AI applications have different levels of potential harm, so regulation should be proportionate to the risks involved rather than applying the same rules to every AI system. A risk-based framework ensures that regulation is neither too weak to protect society nor so excessive that it suppresses innovation. This will make regulation proportionate to the potential harm posed by an AI system.
2. **Universal adoption of the [Bletchley Declaration](#):** The Bletchley Declaration, adopted at the first AI Safety Summit in the UK in 2023, recognised the need for international cooperation to address risks arising from frontier AI. Its wider adoption can provide a common foundation for responsible AI governance.
3. **Establish comprehensive and flexible regulatory framework:** The governments should develop clear guidelines and laws that address various aspects of AI, including data privacy, algorithmic transparency, accountability, and potential biases.
4. **Foster international cooperation:** Given the global nature of AI and its potential impact, collaboration among countries is essential. International standards and agreements should be developed to promote ethical practices and ensure consistency in regulation across borders. In this respect, the [G7 Hiroshima AI Process](#) (HAP) could facilitate discussions.
5. **Encourage industry self-regulation:** Given the rapid evolution of AI, government regulation alone may struggle to keep pace with emerging technologies. Industry-led codes of conduct, technical standards and voluntary safety commitments can complement formal regulation.
6. **Invest in AI research and education:** Governments, academic institutions, and industry stakeholders should allocate resources to R&D, and education in the field of AI. This will help create a well-informed workforce capable of addressing regulatory challenges and ensuring the safe and responsible deployment of AI technologies.

Conclusion: The objective should not be to “**regulate AI out of existence**”, but to “**regulate risks while enabling innovation.**” This will ensure that AI becomes a tool for inclusive development rather than a source of new inequalities and vulnerabilities.

UPSC GS-3: Technology
Read More: [Indian Express](#)

Uniform Civil Code (UCC) – Arguments in favour & Against – Explained Pointwise



Recently, Union Home Minister Amit Shah stated that the Uniform Civil Code (UCC) would be implemented in all NDA-ruled States before the 2029 Lok Sabha elections. The announcement has renewed the debate on balancing equality and gender justice with religious freedom and cultural diversity, necessitating an examination of the arguments for and against UCC.

What is Uniform Civil Code (UCC)? What is the status of UCC in India?

- The **Uniform Civil Code (UCC)** refers to a common set of laws governing **personal matters of all citizens**, irrespective of their religion. These matters include **marriage, divorce, inheritance, adoption, guardianship and succession**.
- The UCC is a proposal in India to formulate and implement personal laws that apply equally to all citizens regardless of their religion, gender, or sexual orientation.
- At present, personal matters like marriage, divorce, inheritance, adoption, and succession are governed by different sets of faith-based personal laws (such as Hindu Personal Law, Sharia Law, or Christian Personal Law). Under a UCC, these distinct religious codes would be replaced by a single, standard civil legal framework binding on all citizens.
- **Constitutional Basis of UCC:** The concept of UCC is enshrined in **Article 44** of the Indian Constitution. The implementation of UCC falls under the **Directive Principles of State Policy (DPSP)**.

Status of UCC in India:

- As of now, India does not have a nationwide Uniform Civil Code.
- The need for UCC was debated in the Constituent Assembly. After long deliberation, it was decided to place UCC under the DPSP.
- Since the adoption of constitution, governments (central & state) has made certain efforts towards implementation of UCC.

Enactment of Special Marriage Act, 1954	The Special Marriage Act, 1954 was enacted to provide secular alternative in marriages. The inheritance rights of the off-springs of couples married under the Act were to be governed by the religion-neutral chapter on inheritance in the Indian Succession Act of 1925.
Continued application of Uniform civil laws in Goa and Puducherry	Goa Civil Code/Goa Family Law: Goa is the only Indian state with a functional uniform civil code (the Goa Civil Code), inherited from Portuguese rule in 1867. Puducherry: In Puducherry, a sizable section of citizens called Renoncants (Indians whose ancestors had during the French rule abandoned personal law) are still governed by the 218-year old French Civil Code of 1804.
<u>Uttarakhand UCC</u>	Uttarakhand became the first state in post-independence India to officially enforce a modern state UCC law in January 2025. It regulates marriage, divorce, succession, and mandatory registration of live-in relationships.
Other States	● Gujarat, Assam, and Madhya Pradesh have passed their respective state-level UCC Bills in 2026 and are undergoing the process of presidential assent and formal notification ● States like Maharashtra, West Bengal, and Rajasthan have set up formal state drafting committees to consult stakeholders and frame regional UCC draft Bills.

- **UCC for the entire country is still a far fetched dream:** Most aspects related to marriage and divorces of persons belonging to different religions are continued to be governed by personal laws. For e.g. Hindu Marriage Act (1955), a Muslim Personal Law (Shariat) Application Act (1937), a Christian Marriage Act (1872) and a Parsee Marriage and Divorce Act (1937).

What are the arguments in favour of implementing UCC?

1. **Fulfilment of Constitutional mandate of equality:** Proponents argue that it is a constitutional mandate to work towards a UCC, which is prescribed by Article 44 of the DPSP. This would ensure equality before the law among all its citizens, irrespective of their religion, class, caste, gender.
2. **Promotion of gender justice and equality:** UCC can help eradicate discriminatory practices related to marriage, divorce, and inheritance in various religious personal laws. **For e.g.** Even though Hindu Succession Act, 1956 was amended in 2005 to give daughters equal inheritance rights at par with sons, but similar reforms have not been adopted universally across all personal laws.
3. **Protects Individual Rights:** UCC can prioritise individual rights, dignity and equality over discriminatory personal-law practices. It can ensure that individuals, particularly women and children, receive equal civil rights irrespective of their religion or community.
4. **Strengthens Secularism:** UCC can strengthen Indian secularism by ensuring that civil rights in matters such as marriage, divorce and inheritance are governed by common, religion-neutral principles, while individuals remain free to practise and propagate their faith under **Articles 25-28**.

5. **Promotes National Integration:** By applying common principles of equality, dignity and justice, UCC can strengthen citizens' identification with the Constitution rather than community-specific legal systems. UCC will affirm the notion of '**one nation, one law**'.
6. **Societal reforms:** A UCC can act as a catalyst for progressive social reform by replacing discriminatory or outdated personal-law practices with gender-neutral and rights-based provisions. It can promote monogamy, equal inheritance, uniform marriageable-age standards, safeguards against arbitrary divorce and stronger rights for children and spouses. **For e.g.** Ending the subdued status of women in the religious sphere.
7. **Simplification of legal matters:** UCC will simplify the cumbersome legal matters governed by different personal laws. It will also help in speedy disposal of cases and reduce burden on the judiciary. **For e.g.** Most of the cases pending cases in the judiciary pertain to the divorce, inheritance issues of persons belonging to different personal laws.
8. **Reflective of progressive jurisprudence:** UCC is an embodiment of the progressive jurisprudence exercised by the Supreme Court in matters related to gender and inter-religious equality. **For e.g.** In cases like Shah Bano case (1985) where SC allowed the grant of maintenance to divorcee woman, Shaira Bano case (2017) where SC banned the discriminatory practice of triple talaq.
9. **Precedent of Goa's Civil Code:** Proponents of the UCC cite the example of successful implementation of UCC in Goa where the civil laws of all Goans, irrespective of religion is governed by a Uniform Civil Code.

What are the arguments against the UCC?

1. **Violation of fundamental right to religious freedom:** Critics argue that the UCC infringes upon the right to religious freedom provided by **Article 25** of the Constitution. Also, UCC infringes upon the right of communities to preserve their distinct culture granted by **Article 29** of the Constitution.
2. **Diverse personal laws and customary practices in India:** Enforcing uniformity will interfere with the diverse personal laws and customary practices followed in India by different communities. **For e.g.** Special Marriage Act, 1954 (A Secular Law) prohibits marriage between first cousins, which is a common practice in some communities in India. Marriage between second cousins is a popular practice among the Hindu communities in South India.
3. **Cultural and Religious Diversity:** India's religious, linguistic, tribal and cultural diversity means that personal practices relating to marriage, inheritance and family life vary significantly across communities. Critics argue that a single UCC may overlook legitimate customary practices and identities, leading to a perception of cultural homogenisation. **For e.g.** Tribal communities in the North-East and other parts of India follow customary laws governing marriage, inheritance and property, some of which enjoy constitutional protection,
4. **Existence of secular laws:** Critics point to the existence of secular laws applicable to all citizens, irrespective of religion. **For e.g.** Section 125 of the Criminal Procedure Code, which is a secular law provides for maintenance, and existence of laws relating to domestic violence like the Domestic Violence Act.
5. **Imposition of 'Hinduised' Code:** Some critics suggest that the UCC might impose a 'Hinduised' code on all communities. **For e.g.** UCC could follow the Hindu practices in matters of marriage, divorce and inheritance and will legally force other communities to follow the same.
6. **Placement of Personal laws in Concurrent List:** Some constitutional law experts argue that perhaps the constitutional framers did not intend total uniformity in personal laws. They cite the placement of personal laws as Entry 5 of the Concurrent List (where the Parliament as well as the State Assemblies have the power to legislate).

7. **Lack of Broad Consensus:** UCC affects deeply rooted religious and customary practices; implementing it without extensive consultation and consensus among diverse communities may generate mistrust, social resistance and polarisation, undermining its broader objectives.
8. **Uniformity Does Not Necessarily Mean Equality:** A single set of laws may provide formal equality, but it does not automatically ensure substantive equality. Different communities may have distinct social, cultural and economic conditions, requiring context-sensitive legal provisions.

What is the Judicial View on UCC?

Shah Bano Case (1985)	Supreme Court directed the Government to enact a UCC. The SC observed that UCC will help the cause of national integration.
Sarla Mudgal Case (1995)	The Supreme Court directed the Government to reflect the steps taken towards securing a UCC for the citizens of India.
Pannalal Bansilal Patil v. State of Andhra Pradesh (1996)	Supreme Court observed that while a uniform law is desirable, its enactment in one go might be counter-productive to the unity and integrity of the nation. Gradual progressive change should be brought about.
John Vallamattom and Ors. v. Union of India (2003)	Supreme Court held that there is no necessary connection between religious and personal law in a civilized society. Matters of secular character like marriage cannot be brought within the guarantee enshrined under Article 25 and 26.
Shayara Bano Case (2017)	Although the case was not directly a judgment on UCC, it demonstrated the Court's willingness to subject personal-law practices to constitutional scrutiny and gender-justice considerations.
Jose Paulo Coutinho Case (2019)	The Supreme Court praised Goa as a "shining example" of a functioning UCC, observing that despite earlier judicial recommendations, no general attempt had been made at the national level to frame a common code.

What should be the way forward?

1. **Awareness efforts to reform current personal laws:** This should be initiated and undertaken by the communities themselves. Legal intervention should be undertaken only if a practice violates fundamental rights of citizens (especially women).
2. **Gradual transformation of diverse personal civil codes to uniform civil code:** 21st Law Commission has recommended that a UCC is neither necessary nor desirable at this stage. Government must take a piecemeal approach in removing the gender disparities in matters of marriage, divorce, inheritance of personal laws. Government must restrain implementing all aspects in single legislation.

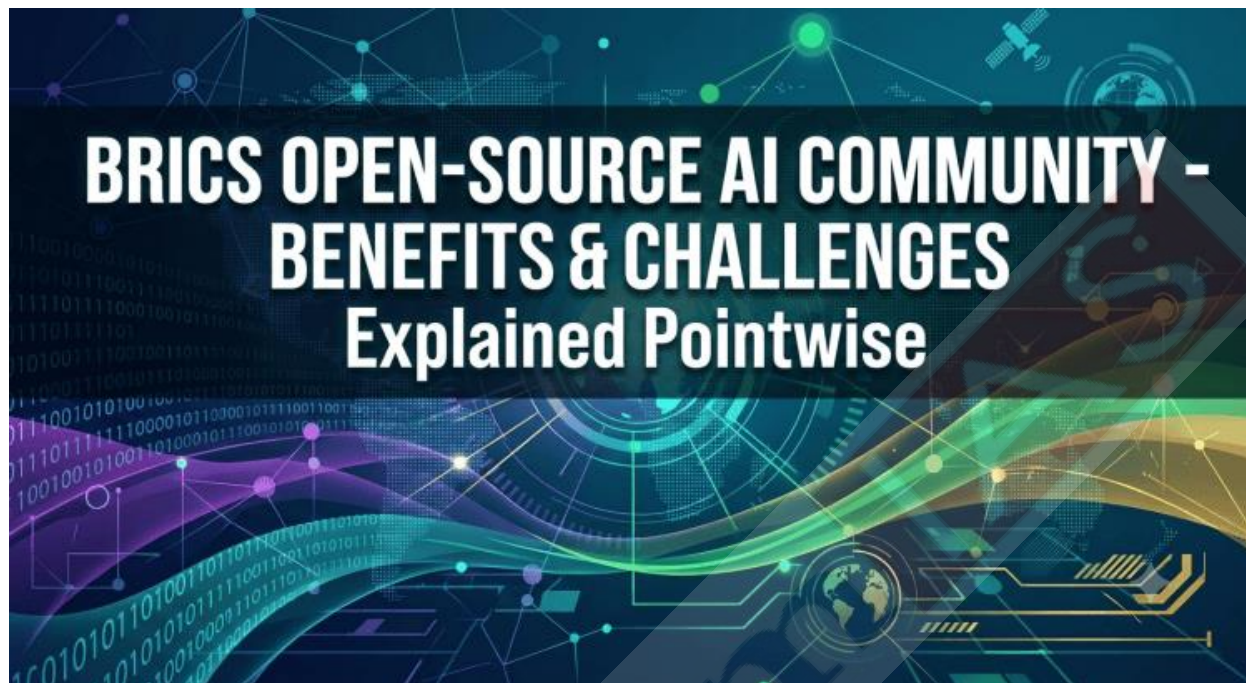
3. **Build Broad-Based Consensus:** UCC should emerge through consultations with communities, women's organisations, tribal groups, legal experts and states, ensuring that reforms reflect constitutional values while addressing legitimate concerns regarding religious freedom and cultural diversity.
4. **Equality between men and women in communities rather than equality between communities:** 21st Law Commission had recommended the government to first concentrate on ensuring the equality between men and women in the same community rather than focusing on the equality between communities.
5. **Protect Legitimate Tribal Customs:** UCC should recognise India's tribal and customary diversity rather than impose a uniform framework without safeguards. Many Scheduled Tribes follow distinct traditions governing marriage, inheritance, family relations and community life. Therefore, reforms should protect customary practices that are consistent with constitutional rights, while eliminating practices that are discriminatory or violate individual dignity.
6. **Learn from Existing Models:** India can draw lessons from Goa's common civil-law framework and Uttarakhand's UCC, particularly regarding codification, registration, exemptions and implementation. Rather than adopting a one-size-fits-all approach, their experiences can help identify practical challenges and best practices.
7. **Prioritise basic reforms:** The government must prioritise basic reforms such as **a)** Having 18 years as the marriageable age for girls for all across communities and genders **b)** Introducing a 'no-fault' divorce procedure and allowing the dissolution of marriage on the ground of irretrievable breakdown, and **c)** Having common norms for post-divorce division of assets.
8. **Follow Constitutional Morality:** The implementation of UCC should be guided by constitutional morality rather than religious or majoritarian preferences. It must balance equality and individual dignity with the constitutional protection of religious freedom and cultural diversity.

Conclusion:

UCC in its true spirit, must be brought about by making gradual changes. As recommended by the Law Commission, the focus should be on ending discriminatory practices against women, rather than enforcing uniformity. However, until that is done, the better course would be to bring about small reforms, correcting some inherent irrationality in some of the personal laws, and make them suitable for modern times. This will lay the foundation of implementing a nationwide UCC at a later date.

Read More: [The Indian Express](#)

UPSC Syllabus: GS-2 Indian Constitution- Significant Provisions

BRICS Open-Source AI Community – Benefits & Challenges – Explained Pointwise

Recently, Chinese President Xi Jinping proposed a **BRICS open-source AI community** to promote technological cooperation and wider access to artificial intelligence. While the initiative offers benefits such as shared innovation and reduced technological dependence, it also presents challenges for India, particularly concerning strategic autonomy, cybersecurity and technological dependence.

What is the proposed BRICS Open-Source AI Community?

- The **BRICS Open-Source AI Community** is a proposal put forward by Chinese President Xi Jinping during the 18th BRICS Summit in New Delhi.
- It is a proposed framework for collaboration among BRICS countries in developing and sharing open-source Artificial Intelligence (AI) technologies.
- China envisions this initiative as an open, shared ecosystem for developing countries to collaborate on artificial intelligence without relying on proprietary, closed-source models controlled by Western tech companies (such as OpenAI, Google, or Anthropic).
- Although the **New Delhi Declaration** issued after the summit does not mention the proposed open-source AI community, China's assumption of the BRICS chairship in 2027 could provide an opportunity to bring these proposals before the grouping again.

What are its major objectives?

1. **Promote Open-Source AI:** Encourage development and sharing of AI models, algorithms, tools and technologies among BRICS countries.
2. **Technology sharing:** Facilitate exchange of AI technologies, expertise and best practices among BRICS members.

3. **Capacity building:** Strengthen AI-related skills, research capabilities and technical talent in developing countries.
4. **Affordable AI access:** Reduce the cost and technological barriers to adopting advanced AI, particularly for developing economies.
5. **AI infrastructure cooperation:** Encourage collaboration in areas such as computing power, data infrastructure and AI training.
6. **Inclusive AI ecosystem:** Promote AI applications suited to the developmental needs of the Global South, including healthcare, agriculture, education and public services.
7. **AI governance:** Facilitate dialogue on responsible, safe and ethical development and use of AI.
8. **Strengthen BRICS Technological Cooperation:** Use AI cooperation to deepen digital and technological partnerships among BRICS members.

What are the potential benefits of the BRICS Open-Source AI initiative for developing countries?

1. **Affordable Access to AI:** Open-source AI models can reduce licensing fees, proprietary software costs and entry barriers, enabling developing countries, startups and public institutions with limited resources to access and customise advanced AI technologies for local needs.
2. **Reduce Technological Dependence:** Open-source AI can reduce developing countries' reliance on a few advanced economies and global technology companies for access to **AI models, algorithms and digital infrastructure**. By sharing technologies, expertise and computing resources, BRICS countries can strengthen **technological sovereignty**, develop indigenous capabilities and reduce risks arising from external technological restrictions.
3. **Bridge the Digital Divide:** Open-source AI can make advanced AI tools more affordable and accessible to developing countries, reducing the technological gap with developed economies. Shared models, knowledge and infrastructure can enable countries to build locally relevant AI solutions in healthcare, education, agriculture and governance, thereby promoting inclusive digital development.
4. **Boost Local Innovation:** Open-source AI allows start-ups, researchers and developers to modify existing AI models according to local needs, languages and socio-economic conditions, reducing development costs and encouraging indigenous AI solutions.
5. **Strengthen South-South Cooperation:** The BRICS Open-Source AI initiative can deepen South-South technological cooperation by enabling developing countries to share AI models, expertise, computing infrastructure and best practices, reducing dependence on technology transfers from developed economies.
6. **Promote Inclusive Development:** Open-source AI can make advanced technologies affordable and accessible to developing countries, enabling their use in healthcare, education, agriculture, financial inclusion and public service delivery. **For e.g.** AI-powered tools can support early disease detection, personalised learning, crop advisory and multilingual government services, helping extend the benefits of technology to underserved and rural populations.

What are the major challenges in developing a common AI ecosystem among BRICS countries?

1. **Divergent Technological Capabilities:** BRICS countries have unequal AI capabilities, digital infrastructure, computing power and research ecosystems. Countries such as China and India have relatively advanced AI sectors, while several newer BRICS members face shortages of skilled professionals, advanced semiconductors and AI research infrastructure. This technological gap can make it difficult to establish common standards and ensure meaningful participation by all members.
2. **Geopolitical Differences:** BRICS countries have diverging strategic interests, foreign-policy priorities and security concerns, which can hinder deep technological cooperation. For instance, India-China strategic tensions may limit the sharing of sensitive AI technologies, data and infrastructure..

3. **Data Privacy & Sovereignty:** BRICS countries have different data-protection laws, data-localisation requirements and approaches to crossborder data sharing. This can make it difficult to create common datasets and train AI models collaboratively. Countries may also be reluctant to share sensitive personal, financial, health or strategic data due to privacy and national-security concerns.
4. **Cybersecurity Risks:** Open sharing of AI models, datasets and algorithms can create cybersecurity vulnerabilities, as malicious actors may exploit them for cyberattacks, deepfakes, misinformation, automated hacking and fraud.
5. **Strategic Autonomy vs. Hegemony:** BRICS members may be concerned that reducing dependence on Western technology could inadvertently create new technological dependence on a dominant member, particularly China, undermining their strategic autonomy.
6. **Compute & Semiconductor Dependency:** Advanced AI development requires high-end chips (GPUs) and substantial computing infrastructure, much of which remains concentrated in a few countries. US export controls and limited access to cutting-edge semiconductor manufacturing, including for Chinese firms, may constrain BRICS' ability to build a fully self-reliant AI ecosystem.

What should be the way forward?

1. **Build an Inclusive & Decentralised Ecosystem:** BRICS should ensure that the AI ecosystem is not dominated by any single country or technology provider. This can be achieved through shared governance, distributed computing infrastructure, and equitable access to AI models and datasets, allowing all members to contribute according to their capabilities while preserving strategic autonomy.
2. **Develop Common AI Standards:** BRICS countries should establish common standards for AI safety, transparency, data protection, interoperability and accountability. Harmonised standards can facilitate cross-border AI cooperation while preventing regulatory fragmentation.
3. **Ensure Data Sovereignty with Responsible Data Sharing:** BRICS countries should establish common protocols for secure and responsible data sharing, while respecting national data-protection and localisation laws.
4. **Establish Strong Cybersecurity Safeguards:** BRICS should establish common cybersecurity protocols for AI models, datasets and computing infrastructure, including vulnerability assessments, secure data-sharing mechanisms, model testing and incident-response systems.
5. **Maintain Strategic Autonomy through Diversification:** To avoid dependence on any single member country, particularly in AI models, semiconductors, cloud infrastructure and critical technologies – BRICS member countries should focus on diversifying technology partnerships, supply chains and sources of computing capacity. This can help in strengthening the strategic autonomy and technological sovereignty while ensuring that BRICS AI cooperation remains genuinely collaborative.

Conclusion: BRICS should pursue building a secure, interoperable and decentralised AI ecosystem that promotes innovation while safeguarding the strategic autonomy of individual members.

UPSC GS-2: International Relations; GS-3: Technology
Read More: [Indian Express](#)

UPI Merchant Charges – Rationale & Impact – Explained Pointwise

The government has recently introduced a **0.4% Merchant Discount Rate (MDR)** on specified UPI payments to merchants above ₹2,000, while keeping person-to-person transactions and most small-value merchant payments free. The move seeks to strengthen the long-term sustainability of the UPI ecosystem, but also raises concerns regarding digital-payment adoption and financial inclusion.

What is the recent government decision regarding charges on UPI transactions?

- The Government of India and the National Payments Corporation of India (NPCI) decided to apply a new **Merchant Discount Rate (MDR) framework** for Unified Payments Interface (UPI) transactions, effective October 15, 2026.
- Earlier, in August, Parliament passed the Taxation and Other Laws (Amendment) Bill, 2026 during the Monsoon Session, amending Section 10A of the **Payment and Settlement Systems Act, 2007**. The amendment doesn't itself impose any fee, but it allows the government to notify a Merchant Discount Rate (MDR) on certain electronic payment modes going forward.
- Under the new MDR framework:
 - **0.4% MDR** will apply to specified **Person-to-Merchant (P2M) UPI transactions above ₹2,000**.
 - For transactions of **₹75,000 or more**, the MDR will be capped at **₹300 per transaction**.
 - **Person-to-Person (P2P) UPI transactions will remain completely free**, irrespective of the amount.
 - Merchant payments **up to ₹2,000 will remain free**.
 - Small merchants receiving up to **₹1 lakh per month through UPI QR codes** will continue to enjoy zero MDR. Over 96% of all merchant transactions fall into these free categories.
 - In sectors such as **railways, telecom, insurance, fuel and agricultural inputs**, transactions above ₹2,000 will attract a **flat ₹5 MDR**.
- The government has clarified that MDR is a **merchant-side charge, not a fee collected from consumers by the government**. Banks have been advised to prevent merchants from passing it on to customers.

What are the major reasons behind this decision?

1. **Ensure long-term sustainability of UPI:** UPI has expanded to a very large scale, creating continuing costs for payment infrastructure, operations and technological upgrades. A revenue stream is intended to make the ecosystem more financially sustainable.
2. **Support payment infrastructure:** MDR revenue will be distributed among ecosystem participants such as banks, payment service providers and UPI application providers, helping them maintain and expand payment infrastructure.
3. **Encourage wider expansion of UPI:** The government intends that the revenue model should support further expansion of UPI, particularly into rural and semi-urban areas. Moreover, a predictable revenue model can encourage banks and payment platforms to continue onboarding merchants and developing UPI-based services.
4. **Reduce dependence on government-funded incentives:** Until now, UPI transactions have largely been subject to zero MDR, limiting the direct revenue earned by banks and payment service providers from many UPI payments. The government therefore provided financial incentives to compensate ecosystem participants for promoting low-value UPI transactions. The new framework will create a direct revenue stream within the payment ecosystem, thereby reducing reliance on budgetary support.
5. **Fund cybersecurity and fraud prevention:** The rapid growth of UPI transactions has increased the need for stronger cybersecurity, fraud detection and prevention mechanisms. Revenue generated

through MDR can help payment ecosystem participants invest in real-time fraud monitoring, secure payment infrastructure, data protection, authentication systems and faster response mechanisms.

6. **Maintain affordability while creating revenue:** Rather than applying MDR universally, the government has limited it to specified P2M transactions above ₹2,000, while keeping P2P payments and most merchant transactions free. The government estimates that about 96% of P2M transactions will remain unaffected.
7. **International expansion:** A financially sustainable domestic ecosystem can also support India's efforts to expand UPI's interoperability and acceptance in other countries, strengthening India's digital-payment footprint.

What are the likely impacts of introducing merchant charges on UPI transactions?

Positive Impacts:

1. **Improved financial sustainability:** New MDR framework can create a more sustainable revenue stream for participants in the digital-payment ecosystem. It can help banks & payment service providers recover part of the costs associated with maintaining payment infrastructure, cybersecurity, fraud prevention and technological upgrades.
2. **Greater investment in infrastructure:** Revenue generated through merchant charges can provide payment ecosystem participants with additional resources to upgrade digital payment infrastructure. This can support improvements in transaction capacity, fraud detection, data protection and system resilience, enabling UPI to handle rising transaction volumes more efficiently and reliably.
3. **Greater competition among payment providers:** The introduction of MDR could create a more sustainable revenue model for banks, fintech companies and other payment service providers. This could encourage competition based on service quality, reliability and value-added features, rather than relying primarily on transaction volumes and market share.
4. **Reduced pressure on government finances:** A revenue-based MDR framework can reduce the UPI ecosystem's dependence on government-funded incentives to compensate banks and payment service providers for zero-MDR transactions.

Negative Impacts:

1. **Higher costs for some merchants:** The introduction of MDR will increase payment-processing costs for merchants undertaking specified higher-value UPI transactions. Although the charge is relatively small, it could affect businesses operating on thin profit margins, particularly in sectors with high transaction volumes.
2. **Possible pass-through to consumers:** Although the MDR is a merchant-side charge, some merchants may attempt to recover the additional cost from consumers by increasing prices or adding a separate payment fee.
3. **Possible shift towards cash or alternative modes:** Introducing merchant charges on certain higher-value UPI transactions could encourage some merchants to prefer cash or alternative digital payment methods to reduce transaction costs.

How are major instant payment systems around the world funded?

Instant Payment System	Country	How it is funded?

Pix	Brazil	Individuals generally use Pix free of charge, while merchants can be charged by their financial institutions for receiving payments. This creates a merchant-funded component while keeping retail users largely free.
FedNow	USA	FedNow is operated by the Federal Reserve as an infrastructure service for participating banks and credit unions. The Federal Reserve invested about \$545 million in developing the system, while participating institutions pay service fees to access it.
Faster Payments	UK	Operated through the UK's banking/payment infrastructure, with participating financial institutions bearing system and participation costs. The costs can ultimately be reflected in the broader commercial pricing of banking services.
PayNow	Singapore	Operated as part of Singapore's banking/payment infrastructure. Consumers generally receive a low-cost or free retail experience, while participating financial institutions bear infrastructure and participation costs.

What should be the way forward?

1. **Maintain affordability:** UPI charges should be designed in a manner that preserves the affordability and convenience of digital payments, especially for low-value transactions and small merchants. The government should continue to keep essential, everyday payments free or minimally priced, while ensuring that any charges on higher-value transactions remain proportionate.
2. **Protect small merchants:** MDR framework should provide adequate exemptions or concessional rates for micro and small businesses. The government can also use transaction-value and turnover-based thresholds to ensure that larger businesses contribute more while small merchants remain protected.
3. **Monitor impact on cash usage:** The government and Reserve Bank of India should regularly assess whether merchant charges are encouraging businesses to shift from UPI towards cash or other payment modes. If evidence shows that charges are discouraging digital payments, the pricing structure could be reviewed, particularly for small businesses and low-margin sectors.
4. **Gradually develop a sustainable pricing model:** India should gradually move towards a financially sustainable pricing model for UPI without undermining its affordability and widespread adoption. Any charges should be proportionate to transaction value and the cost of providing the service. The government can periodically review MDR rates based on transaction volumes, ecosystem costs, and merchant profitability.
5. **Balance sustainability with financial inclusion:** The pricing framework should protect low-value transactions and small merchants, while ensuring that payment providers have adequate incentives to invest in a secure and reliable digital-payment ecosystem. This would help preserve UPI's role as an instrument of financial inclusion, digitalisation and accessible payments.

UPSC GS-3: Indian Economy
Read More: [Indian Express](#)

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



India ranks as the world's **2nd 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.

What is meant by the fisheries sector?

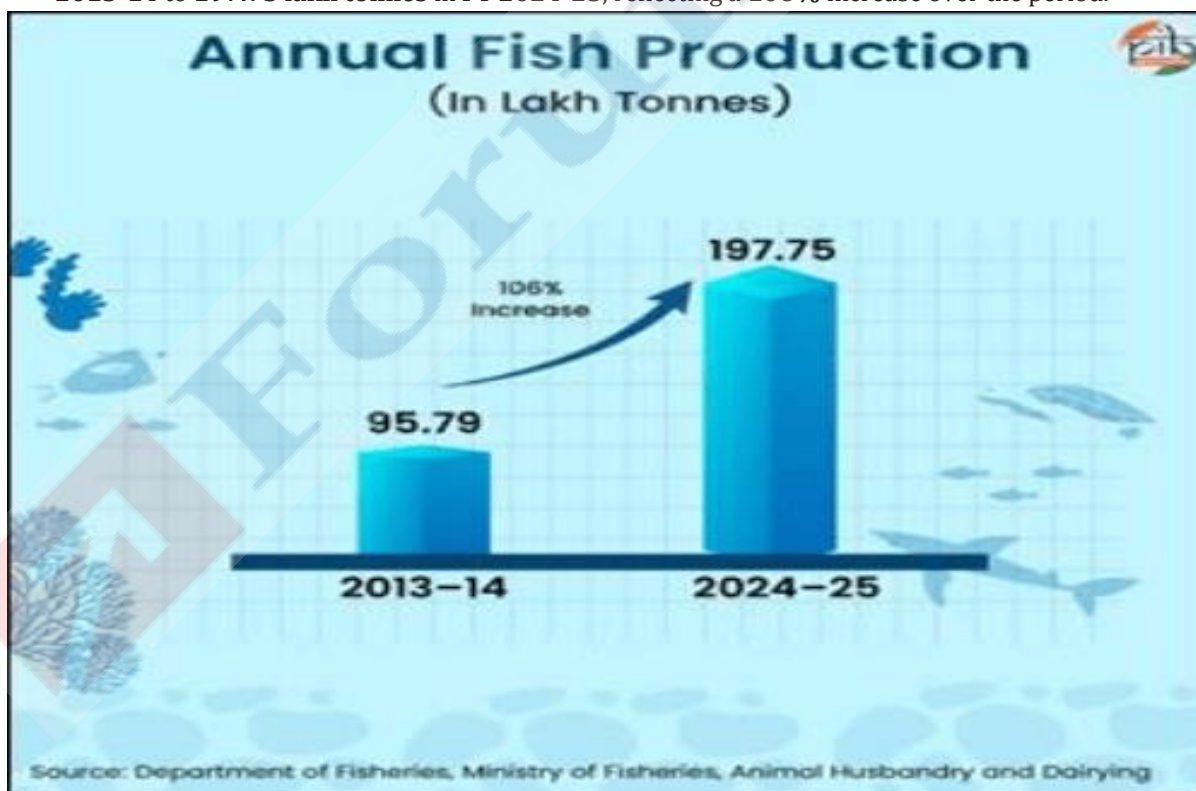
- The **fisheries sector** is a vital part of the global economy and food system. It involves the **harvesting, processing, distribution, and management of fish and other aquatic organisms** such as crustaceans (shrimp, crabs), mollusks (oysters, clams), and aquatic plants.
- Fisheries sector includes:

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.
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	○ 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 kilometers** 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

Marine Fish Stock Status of India:

ICAR-Central Marine Fisheries Research Institute (CMFRI) has assessed the status of India's commercially important marine fish stocks using scientific stock assessment methods. Some of the key findings are:

- 91.1% of the 135 commercially important fish stocks** assessed in 2022 were found to be **biologically sustainable**, indicating that current exploitation levels are generally within sustainable limits.
- Around **8.9% of the assessed stocks** were found to be **overfished or undergoing overfishing**, highlighting the need for targeted conservation and fishery management measures.
- CMFRI highlighted immense potential in seaweed farming, identifying **333 prospective seaweed farming sites** covering nearly 23,950 hectares. While India's current production is minor, the report noted it could provide substantial alternative revenue for coastal communities.

What is the significance of the fisheries sector and aquaculture?

- Food & Nutrition Security:** Fish is an affordable and accessible source of animal protein, vitamins, and omega-3 fatty acids, making it essential for combating malnutrition in rural and coastal communities. The sector is often vital to the dietary habits of vulnerable and marginalized populations.
- Economic Growth & Exports:** Fisheries are one of the fastest-growing allied agricultural sectors, contributing about \$6.24 billion (₹62,408 crore) in seafood exports in recent years. India is a leading exporter of shrimp globally. The sector also contributes roughly 1-2% to the national GDP and nearly 7.5% to the Agricultural Gross Value Added (GVA).
- Livelihoods & Employment:** Providing income for more than 28 million fishers, fish farmers, and allied workers, the industry is a massive driver of rural development. It supports vital supplementary

incomes for marginal farmers and provides active roles for women in processing, value-addition, and marketing. It strengthens rural and coastal economies and provides supplementary income to farmers.

4. **Resource Utilization & Potential:** India is blessed with vast resources, including over 8,000 km of coastline, vast estuaries, and millions of hectares of inland reservoirs and tanks. Modern aquaculture – such as brackish-water shrimp farming, cage culture, and advanced techniques like Recirculating Aquaculture Systems (RAS) – helps turn underutilized and even wastelands into highly productive assets.
5. **Empowering Women:** Aquaculture and fish processing are highly inclusive, providing significant employment and financial independence to women, who make up a large percentage of the post-harvest workforce (Women constitute **55-62% of the workforce**, especially dominant in post-harvest and processing operations (62%)).
6. **Biodiversity Protection:** Effective management of the sector – like implementing the sustainable practices outlined by institutes like CMFRI – ensures marine ecosystems remain balanced and resilient against climate change.
7. **Poverty Alleviation & Equity:** Fisheries sector provides supplementary income to small and marginal farmers. It offers livelihood options for landless and vulnerable communities through community-based or cage farming.
8. **Environmental & Ecosystem Benefits:** Fisheries sector:
 - 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. **Overexploitation & Resource Sustainability:**
 - Although official data indicate that most of India's marine fish stocks are sustainable, the Food and Agriculture Organization (FAO) argues that India's marine fish production has reached a plateau, as most major fish stocks are already fully exploited. 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**.
 - Small-scale, mechanized trawling has caused significant seabed damage, and coastal states often **lack sufficient staff/patrol boats** to enforce the 5-nautical-mile no-trawling zone meant to protect inshore ecosystems.
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. **Lack of Export Market Diversification:** India's fisheries exports remain concentrated in a limited number of markets, particularly the **United States, China, Southeast Asia and the European Union**. Such concentration creates vulnerability because changes in tariffs, sanitary and phytosanitary (SPS) standards, consumer preferences, geopolitical tensions or economic slowdowns.
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.

Case Study:

In 2025, unseasonal rains and cyclones in Palghar, Maharashtra, destroyed dried fish stocks worth an estimated ₹100 crore, pushing over 1,00,000 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. **Inshore Degradation and Destructive Fishing:** While deep-sea or overall fish stocks might occasionally show healthy numbers, **inshore coastal ecosystems are facing severe depletion**. The widespread use of non-selective bottom trawling destroys benthic habitats and results in massive amounts of “bycatch” (accidental capture of non-target, juvenile, or endangered species).
6. **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.
7. **Slow Adoption of Advanced Technology:** While high-tech solutions like **Recirculating Aquaculture Systems (RAS)**, AI-driven feeding, and automated water-quality monitors exist, their high initial capital costs keep them out of reach for the vast majority of traditional farmers.
8. **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.
9. **Global Competition:** India’s fisheries sector faces intense competition in international markets from major seafood-exporting countries such as **China, Vietnam, Thailand, Ecuador and Norway**. These countries often possess advanced processing technologies, better cold-chain infrastructure, stronger branding, and greater compliance with international quality standards.

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

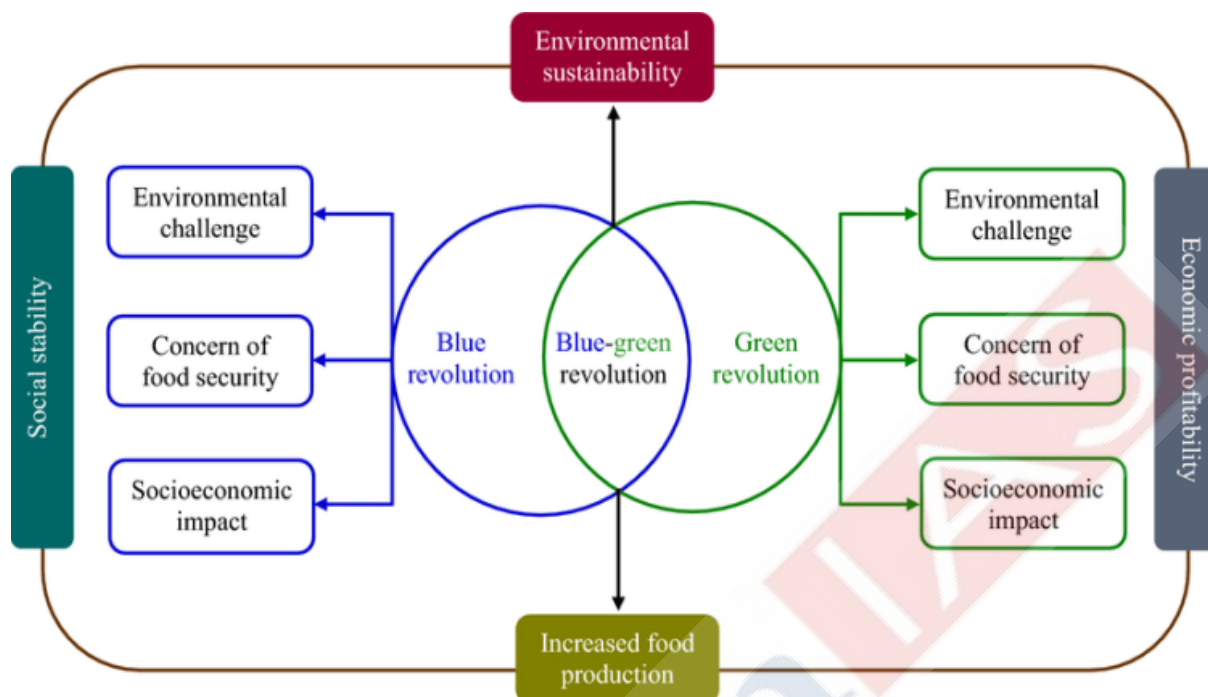
Blue Revolution	The Blue Revolution, launched in 2015, seeks to increase fish production and strengthen the fisheries value chain across inland and marine sectors by enhancing productivity, expanding infrastructure, and promoting modern practices. To build on these efforts and further advance post-harvest 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. Pradhan Mantri Matsya Kisan Samridhi Sah-Yojana Focus Areas 01 Formalisation of unorganised fishers through digital identity under NFDP. 02 Improved access to institutional finance, including working capital. 03 One-time incentive for aquaculture insurance (one crop cycle). 04 Performance grants to improve A- efficiency of fisheries value-chain. B- Creation and maintenance of jobs. 05 Performance grants to promote A- Adoption, expansion of fish. B- fishery product quality and safety assurance systems. 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.
National Policy on Marine Fisheries (NPMF), 2017	NPMF (2017) provides a comprehensive framework for sustainable development, management, and conservation of marine fisheries.
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.
Blue Economy and Deep-Sea Fishing Framework	The government introduced a dedicated enabling framework to sustainably harness fisheries from the Indian Exclusive Economic Zone (EEZ) and the High Seas. Special focus and financial resources are being funneled into the Andaman & Nicobar and Lakshadweep Islands to build modern marine hubs. Financial assistance is provided to traditional fishers to upgrade their vessels or transition from over-exploited near-shore waters into deep-sea resource fishing.

What should be the way forward?

1. **Blue-Green Revolution:** India's fisheries sector needs to move towards a **Blue-Green Revolution**, going beyond the present focus of the Blue Revolution. The Blue-Green Revolution represents a synthesis of the **Blue Revolution's** emphasis on productivity and the blue economy with **Green principles** of sustainability, climate resilience and resource efficiency.



Source: Research Gate

2. **Deep Sea Fishing and EEZ Utilization:** With near-shore waters facing overexploitation, attention is increasingly shifting towards deep-sea fishing. This requires investment in Blue Economy hubs in the Andaman & Nicobar and Lakshadweep Islands to support deep-sea fishing fleets. However, the FAO estimates that exploiting deep-sea resources would yield only a marginal increase in overall fish production.
3. **Prioritising Community-Led Models:** Fishermen Cooperative Societies and Fish Farmer Producer Organizations (FFPOs) should be given priority for deep-sea fishing operations. This empowers small-scale fishers by enabling them to access high-value resources like tuna.
4. **Good Aquaculture Practices (GAqP):** India should promote GAqP to improve the quality, safety and traceability of farmed fish and shrimp meant for export. Certification, traceability systems and regular testing can further build confidence among global buyers, reduce export rejections and enhance India's reputation as a reliable seafood supplier.
5. **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.
 - **Stricter Trawling Regulations:** Phasing out destructive bottom trawling in ecologically sensitive zones and introducing stricter enforcement of seasonal fishing bans using satellite monitoring.
6. **Move from Volume-Driven to Value-Driven Growth:** Shift export composition away from raw frozen shrimp (currently 70%+ of earnings) toward **processed, ready-to-eat, and higher-margin seafood products** – reducing vulnerability to tariff shocks like the recent US duty hikes.

7. **Diversify Export Markets:** Reduce overdependence on the US and China by actively developing markets in the **EU, Southeast Asia, Middle East, and Africa**, cushioning against demand shocks or trade policy shifts in any single market.

Conclusion: The fisheries sector is a critical contributor to India's economy, supporting the livelihoods of nearly 3 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

Read More: [PIB](#), [Indian Express](#)

Semiconductor Industry in India – Significance & Challenges – Explained Pointwise



Recently, Prime Minister Narendra Modi inaugurated the fifth edition of **SEMICON India 2026**. The event reflects India's transition from policy formulation towards actual semiconductor production and a broader domestic ecosystem.

India is emerging as a semiconductor hub, developing indigenous chips like **VIKRAM 3201**, **DHRUV64** to boost self-reliance. The market is growing from \$38 billion in 2023 and is expected to reach \$110 billion by FY30 & \$200bn by FY35.

This article examines the semiconductor industry in India, focusing on its significance, key challenges, government initiatives, and the way forward.

What are Semiconductors? What is their importance?

- **Semiconductors:** Semiconductors are materials whose electrical conductivity lies between that of conductors and insulators. Their conductivity can be controlled by factors such as temperature, impurities, electric fields and light. They can either be **pure elements**, like silicon or germanium or **compounds**, like gallium, arsenide, or cadmium selenide.

- **Important Properties of Semiconductors:**

- **Intermediate conductivity:** Their electrical conductivity is between conductors like copper and insulators like glass.
- **Negative temperature coefficient:** Unlike metals, their electrical resistance generally decreases as temperature increases, because more charge carriers become available.
- **Conductivity can be controlled:** Their conductivity can be deliberately modified by adding small quantities of impurities (a process called doping).
- **Sensitive to light:** Some semiconductors change their electrical behaviour when exposed to light, forming the basis of solar cells, photodiodes and light sensors.

Importance of Semiconductors:

1. **Foundation of modern electronics:** Semiconductor chips are the heart and brain of all modern electronics and communications technology products, contemporary automobiles, household gadgets such as refrigerators, and essential medical devices such as ECG machines.
2. **Propeller of emerging technologies:** The development of emerging technologies like AI, 5G, or driverless cars is dependent upon a fast and cheap semiconductor industry.
3. **Telecommunications:** Semiconductors are crucial for 5G/6G equipment, routers, satellites, optical communication and wireless devices, enabling high-speed communication.
4. **Economic importance:** The semiconductor industry supports high-value manufacturing, R&D, skilled employment, exports and technological innovation. Countries with strong semiconductor capabilities can participate more deeply in the global digital economy.
5. **Aiding the further development of electronic devices:** Semiconductors make the devices more compact, less expensive, and more powerful. **For e.g.** Semiconductor chips have enhanced the features of smartphones with powerful processing.
6. **Most traded products after petroleum:** Semiconductors are globally the most-traded products after petroleum and cars, with an annual turnover of \$500 billion.
7. **Transformative potential:** Semiconductors continue to enable the world's greatest breakthroughs and transformation in industries, ranging from aerospace and consumer electronics to energy and medicine.

What are the defining features of Semiconductor manufacturing?

Semiconductor manufacturing involves following stages:

Raw materials → Wafer manufacturing → Chip design → Fabrication → Packaging → Testing → Integration into electronic products

1. **Front-end manufacturing and back-end assembly:** Semiconductor manufacturing comprises the front-end fab manufacturing and the back-end assembly, including packaging and testing. However, the front-end fab manufacturing is a complex process, with only a handful of companies involved in large scale fab-manufacturing.
2. **Highly technology-intensive:** Manufacturing semiconductors requires advanced technologies such as photolithography, etching, deposition, ion implantation and chemical-mechanical polishing (CMP). Even tiny manufacturing errors can make a chip defective.
3. **Extremely high precision:** Modern chips contain billions of transistors on a very small area. Manufacturing therefore requires extremely precise control at microscopic and sometimes nanometre scales.

4. **Capital-intensive:** Setting up a semiconductor fabrication plant (**fab**) requires enormous investment in specialised equipment, cleanrooms and supporting infrastructure. Advanced fabs can require billions of dollars in capital.
5. **Requires ultra-clean environments:** Even microscopic particles can damage semiconductor wafers. Fabs therefore operate in highly controlled cleanrooms with strict control over dust, temperature, humidity and vibrations.
6. **Highly concentrated global supply chain:** Globally, the entire semiconductor value chain has seeped in the interdependence between a handful of countries like the **USA, Taiwan, Japan, China, and some European nations**. Within this chain, there's an extraordinary degree of specialisation that makes it vulnerable to shocks. **For e.g.** 100% of the world's most advanced (below 10 nanometres) semiconductor manufacturing facilities are located in just two countries, **Taiwan** and **South Korea**.
7. **Revenue sharing b/w few companies:** The top 3 companies in each stage of the semiconductor supply chain take in about 80-90% of the revenue.

Semiconductor manufacturing status in India:

1. **Semiconductor R&D footprint in India:** India has an existing base for design and verification for the semiconductor industry. Most of the global semiconductor companies having an R&D footprint in India.
2. **Fabrication facilities limited to strategic semiconductor development:** India has two fabs – **SITAR**, a unit of the Defence Research and Development Organisation (DRDO) in Bengaluru, and a **semiconductor laboratory** in Chandigarh. These build silicon chips for strategic purposes like defence and space, and not for commercial use.
3. **High import dependence:** **100%** of our semiconductor chips, memory, and display cards are imported into the country. In 2020, India spent \$15bn on electronic imports, with **37%** coming from China.
4. **Rapid expansion of ATMP/OSAT (Packing & Testing) facilities:** India has made faster progress in Assembly, Testing, Marking and Packaging (ATMP)/Outsourced Semiconductor Assembly and Test (OSAT).
5. **Strong position in chip design:** India already has a significant advantage in semiconductor design and engineering talent. Government data indicates that India hosts about **20%** of the global semiconductor chip-design workforce and around **7%** of global semiconductor-domain GCCs.
6. **Progress under ISM 1.0:** As of December 2025, 10 projects worth Rs. 1.60 lakh crore have been approved across 6 states, covering silicon fabs, silicon carbide fabs, advanced packaging, and ATMP facilities.



Source- PIB

Why is there a global race to diversify semiconductor supply chains?

1. **Over concentration of manufacturing units:** Semiconductor chip manufacturing is concentrated in a few countries. **For e.g.** Taiwan produces over 60% of the world's semiconductors, and along with South Korea makes 100% of the most advanced chips (below 10 nanometers). A disruption in one major producing region can affect industries worldwide.
2. **Supply chain disruption due to epidemic:** The semiconductor industry experienced significant supply shortages during the pandemic due to disruptions in China's production. The pandemic demonstrated how semiconductor shortages can disrupt automobiles, electronics, telecommunications and other downstream industries. Because chips are an upstream input used across numerous industries, a shortage can have economy-wide effects.
3. **Geopolitical conflicts:** The ongoing Russia-Ukraine conflict has resulted in shortages of raw materials for domestic industries. **For e.g.** Ukraine plays a critical role as a key supplier of neon, which is an essential input in semiconductor manufacturing.
4. **Emerging geopolitical contestations:** Growing US-China strategic competition, export controls, trade restrictions and technology disputes have made dependence on a limited number of suppliers a strategic concern. Governments therefore want greater control over critical semiconductor capabilities. **For e.g.** US has restricted its firms and its allies from assisting the Chinese production of 16 nanometers or smaller chips.
5. **Economic and national-security importance:** Semiconductors are essential not only for consumer electronics but also for AI, telecommunications, automobiles, defence, satellites and critical infrastructure. Consequently, reliable access to chips has increasingly become an element of economic and technological security.
6. **Rise of AI and advanced computing:** The rapid expansion of AI, data centres and high-performance computing is increasing the strategic importance of advanced chips. This has encouraged countries to secure domestic or trusted access to semiconductor manufacturing and related technologies.

7. **Pursuit of technological sovereignty:** Countries increasingly want to reduce excessive dependence on foreign suppliers for technologies considered strategically important. This has led to policies supporting domestic fabs, chip design, advanced packaging, semiconductor equipment and materials.

Therefore, many countries are looking to diversify their supply chain. India seeks to take advantage of countries eyeing for diversification of supply chains.

What is the significance of development of indigenous semiconductor industry in India?

1. **Tackling supply shocks:** The pandemic and the subsequent lockdowns impacted the supply of chips to India. **For e.g.** Automobile manufacturers like Mahindra & Mahindra and Tata group were compelled to reduce their production due to the shortage.
2. **Meeting the rising demand:** Experts estimate that around 50 crore people will join the internet in the next decade, which will increase the demand of more phones and laptops. Similarly, the post-pandemic world is showing a greater inclination towards work from home culture. This warrants an enhanced demand for servers, internet connectivity, and cloud usage. Hence, indigenous semiconductor industry is needed to meet the rising demands. There is a huge domestic market for semiconductors which could exceed \$60 billion by 2026.
3. **Reduce import dependence:** A domestic ecosystem can reduce India's dependence on imported chips and other critical semiconductor components, particularly as domestic demand for electronics, EVs, AI and data centres expands.
4. **Boost high-value employment:** The semiconductor industry requires specialised engineers, technicians, researchers and manufacturing professionals. It can therefore create high-skilled, high-productivity employment and strengthen India's technical talent base.
5. **Revenue boost:** Indigenous capacity would attract local taxes and boost the export potential. Further, India would be required to import fewer semiconductor chips, which would decrease the import bill. **For e.g.** India imports almost all semiconductors to meet its demand, which is estimated to reach around \$100 billion by 2025.
6. **Enhanced Security:** Chips made locally will be designated as "trusted sources" and can be used in products ranging from CCTV cameras to 5G equipment. This would improve the national cybersecurity profile.
7. **Geopolitical Benefits:** Countries having a sufficient supply of chips would be in a better position to mold the future course of geopolitics, driven by data and the digital revolution. Further self-sufficiency will decrease reliance on Chinese chip imports, especially during hard times like the Galwan Valley border clash.
8. **Promote R&D and innovation:** Building fabs and advanced packaging facilities can encourage research in materials science, electronics, nanotechnology, chip architecture and semiconductor equipment, while creating stronger links between universities, startups and industry.
9. **Generate economic multiplier effects:** Semiconductor manufacturing can stimulate related industries such as specialty chemicals, gases, precision machinery, electronics, logistics, testing and advanced materials, creating a wider industrial ecosystem.

What have been the government efforts towards development of semiconductor industry in India?

National Policy on Electronics, 2019	It envisions positioning India as a global hub for Electronics System Design and Manufacturing (ESDM) sector . It aims to encourage the development of core components (including chipsets) and create an enabling environment for the industry to compete globally.
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Semicon India Programme (2022)	The government has approved the Semicon India programme with a total outlay of INR 76,000 crore for the development of semiconductor and display manufacturing ecosystem in the country. Semicon 1.0: Launched with an initial outlay of ₹76,000 crore to build a domestic semiconductor and display manufacturing ecosystem. It provided fiscal support for setting up fabs, compound semiconductor/silicon carbide facilities, and OSAT/ATMP (packaging and testing) units. Semicon 2.0: In July 2026, the Union Cabinet approved Semicon 2.0 with an outlay of ₹1,27,500 crore. It seeks to build on Semicon India and expand capabilities in areas such as chip design, semiconductor equipment and materials, Indian semiconductor IP and supply-chain resilience.
Modified Scheme for setting up of Semiconductor Fabs in India	It aims to attract large investments for setting up semiconductor wafer fabrication facilities in the country. The Scheme extends a fiscal support of 50% of the project cost on an equal footing basis for setting up of Silicon complementary metal-oxide semiconductor (CMOS) based Semiconductor fabrication in India.
Modified Electronics Manufacturing Clusters (EMC 2.0) Scheme	Under this, the government will provide support for the setting up of Electronics Manufacturing Clusters (EMCs) and Common Facility Centres (CFCs).
Foreign Direct Investment	The Government of India has allowed 100% (FDI) under the automatic route in the Electronics Systems Design & Manufacturing sector.
Production Linked Incentive Scheme (PLI)	Under this, the government will provide an incentive of 4% to 6% on goods manufactured in India and covered under target segments to eligible companies for a period of five years.
Design Linked Incentive (DLI)	The DLI Scheme provides financial incentives and design infrastructure support for ICs, chipsets, System-on-Chips (SoCs), systems and IP cores. This helps India leverage its existing strength in semiconductor design and move towards higher-value activities.
India Semiconductor Mission	The India Semiconductor Mission was established as the institutional framework for implementing India's semiconductor strategy, facilitating investment, evaluating projects and developing the semiconductor ecosystem.

	As of 2026, it has approved 13 semiconductor projects with cumulative investments exceeding ₹1.64 lakh crore, spread across Gujarat, Assam, Uttar Pradesh, Odisha, Punjab, and Andhra Pradesh. The Union Budget 2026-27 launched India Semiconductor Mission 2.0 with Rs. 1,000 crore to boost domestic chip capabilities through local equipment and material production, full-stack IP design, and industry-led R&D and skilling.
Skill Development	The government has set targets to train 1,00,000 semiconductor technicians and engineers and attract 200 chip design startups, aiming to address a projected one-million-person talent gap in the global semiconductor and AI sector.
International technology partnerships	India has entered into semiconductor-related cooperation with major technology partners, including the US, European Union, Japan and Singapore , to strengthen technology transfer, investment and supply-chain resilience.

What are the challenges in the semiconductor industry in India?

1. **Very high capital requirements:** Setting up a semiconductor fabrication plant requires billions of dollars of investment in cleanrooms, specialised machinery and supporting infrastructure. As per a government estimate, it would cost roughly 5 –7 billion to set up a chip fabrication unit in India.
2. **Dependence on imported equipment and technology:** Advanced semiconductor manufacturing requires highly specialised equipment, materials and intellectual property. India remains dependent on global suppliers for several of these critical inputs, limiting complete technological self-reliance.
3. **Shortage of specialised skilled manpower:** While India has a large pool of engineers and a strong chip-design workforce, there is a relative shortage of professionals with hands-on expertise in fab operations, semiconductor process engineering, equipment maintenance, materials science and advanced packaging.
4. **Bureaucratic inefficiencies:** The process of establishing an indigenous semiconductor facility requires clearances and approvals from multiple government departments. Further, there exists a considerable degree of bureaucratic delays at each stage that discourages the establishment of manufacturing units.
5. **Infrastructure requirements:** Fabs require uninterrupted power, large quantities of ultrapure water, specialised gases, chemicals, cleanrooms and reliable logistics. Establishing this ecosystem at scale is complex and expensive.
6. **Technological Constraint:** The indigenous manufacturing of semiconductors requires the use of high-end technologies. These technologies are licensed from patent holders at a very high price.
7. **Structural Flaws:** FDI in electronics is less than 1% of the total FDI inflow because of the dearth of skilled labor, delays in land acquisition, and the uncertain tax regime.
8. **Competition from established semiconductor hubs:** India faces competition from established manufacturing ecosystems in **Taiwan, South Korea, Japan, the United States, China and Singapore**,

which possess decades of accumulated technological expertise, supplier networks and manufacturing experience.

What should be the focus area for Indian Semiconductor Industry?

R&D-intensive activities	R&D-intensive activities like electronic design automation (EDA) , core intellectual property (IP) , and chip design . The US is the leader in this segment. India can get part of the business by supporting its existing chip-design experts and funding technology and innovation centres , including top engineering colleges.
FABS facilities for advanced chips	India should focus on setting up of semiconductor fabrication (FABS) facilities for making of advanced chips.
Focus on medium and low-end chips	Due to the pandemic related supply disruptions and tensions between the US and China , the US, Japan, and many other countries have announced plans for setting up local Fabs . This might lead to a surplus capacity for high-end Fabs in the near future. Hence, India should focus on making medium and low-end chips.
Assembly, testing and packaging (ATP) segment	This segment captures 10% of the value . China is the current leader. With low-cost skilled technical manpower, India is a natural choice to take some part of the business.
Full-Stack IP Design	ISM 2.0 emphasises indigenous IP creation – reducing royalty payments and establishing technological sovereignty.
Local Equipment & Materials	ISM 2.0 focuses on producing semiconductor equipment and materials domestically, a critical supply chain gap

What Should be the Way Forward?

1. **Build an end-to-end ecosystem:** India should develop capabilities across the entire value chain (chip design, semiconductor-grade materials, equipment, wafer fabrication, packaging, testing and electronics manufacturing) rather than focusing only on fabs.
2. **Strengthen semiconductor R&D:** Greater public and private investment should be directed towards semiconductor process technology, materials, equipment, chip architecture and indigenous intellectual property (IP). Stronger industry-academia-research-institution linkages can accelerate commercialisation.
3. **Develop specialised human capital:** India should create specialised programmes in semiconductor fabrication, process engineering, equipment maintenance, materials science, chip design and advanced packaging. Industry-oriented training and apprenticeships can complement conventional engineering education.
4. **Ensure reliable infrastructure:** Semiconductor clusters need 24×7 high-quality electricity, ultrapure water, waste-treatment facilities, cleanrooms, high-speed logistics and robust digital infrastructure. Dedicated semiconductor industrial clusters can help provide these facilities.

5. **Provision of adequate funding:** Adequate funding must be provided to augment the research and development potential of technical institutes. **For e.g.** IIT Madras developed a microprocessor named 'Moushik' with funding support from the Ministry of Electronics and Information Technology.
6. **Expeditious execution of Sovereign Patent Fund (SPF):** The Sovereign Patent Fund (SPF) under National Policy on electronics should be established expeditiously. It is a wholly or partly Government-backed entity that aims to bolster domestic businesses through the acquisition and licensing of patented technology.
7. **Support of businesses:** The government should also support businesses in the acquisition of semiconductor manufacturing units in other countries. This is easier than setting up a domestic facility and can be done swiftly for ensuring a continuous supply of chips. Hand-holding startups of entrepreneurial engineers can also produce large payoffs.
8. **Initial Focus on back-end of manufacturing:** Semiconductor foundries are the world's most expensive factories, accounting for 65% of industry capital expenditure but only 25% of the value addition. Therefore, to lower the risks of investment, India should especially look at back-end of manufacturing such as assembly, packaging and testing. Once it stabilises and an ecosystem develops, front-end of manufacturing will follow.
9. **Integrate with global value chains:** India should pursue "China+1" and supply-chain diversification opportunities while avoiding an unrealistic goal of complete self-sufficiency. The objective should be to become a trusted, competitive and resilient node in global semiconductor value chains.

Conclusion: The 21st century will be an era of Digital revolution signifying an increased use of mobile phones and computer devices. This enhanced usage can be met only with a robust availability of semiconductor chips that sustains their functioning. Therefore India needs to focus on the indigenous development of semiconductors in order to realize its digital potential and emerge as a strong power in the present era.

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UPSC Syllabus- GS 3- Indian Economy

Graham Act – Rationale & Implications – Explained Pointwise

The Lindsey O. Graham Sanctioning Russia and Iran Act, 2026, recently signed into law by the United States, seeks to intensify economic pressure on Russia by targeting its energy revenues, defence sector and sanctions-evasion networks. The Act is significant for India given its dependence on Russian crude and the possibility of higher U.S. tariffs on major buyers of Russian energy. Therefore, it is important to examine the rationale behind the Act, its wider geopolitical and economic implications, particularly for India.

What is the Lindsey O. Graham Sanctioning Russia and Iran Act, 2026? What are its major provisions?

- The **Lindsey O. Graham Sanctioning Russia and Iran Act of 2026** is a U.S. law aimed primarily at increasing economic pressure on **Russia over the Ukraine war**, while also extending and strengthening certain sanctions against **Iran**.
- The Act establishes a comprehensive sanctions framework targeting the political, financial, energy, and commercial networks sustaining Russia's war in Ukraine.
- While the legislation does not name individual nations directly, the criteria place major buyers like **India and China** squarely within its regulatory scope.

Major Provisions of the Act:

1. **Sanctions against Russian officials and entities:** The Act provides for sanctions against Russian officials, oligarchs, their family members and other persons supporting the Russian government.
2. **Targeting Russia's "Shadow Fleet":** Sanctions can be imposed on vessels and foreign persons involved in helping Russia evade existing sanctions, particularly through the transportation of Russian oil.
3. **Up to 100% tariffs on major buyers of Russian energy:** The President is empowered to impose tariffs of up to 100% on imports from the five largest purchasers of Russian crude oil or natural gas.
4. **Conditional treatment of natural-gas imports:** Countries whose Russian natural-gas imports constitute less than **15%** of Russia's total natural-gas exports and which are taking significant steps to reduce those imports can qualify for an exemption.
5. **Tariffs on Russian-origin goods:** The legislation authorizes tariffs of up to **500%** on Russian-origin goods, subject to specified exceptions.

Why has the United States introduced the Graham Act?

1. **To pressure Russia over the Ukraine war:** The primary objective is to increase the economic cost for Russia of continuing its war in Ukraine by targeting its energy and defence sectors and entities involved in sanctions evasion.
2. **To reduce Russia's energy revenues:** Russia's oil and gas exports provide an important source of government revenue. The Act therefore targets Russia's energy trade and gives the U.S. President authority to impose tariffs on major purchasers of Russian energy.
3. **To discourage third countries from purchasing Russian energy:** By allowing tariffs of up to **100%** on imports from major buyers of Russian oil or gas, the legislation seeks to make continued purchases of Russian energy more costly for third countries. This provision potentially affects major buyers such as **India and China**.
4. **To target sanctions-evasion networks:** The Graham Act seeks to target Russia's "**shadow fleet**" and other networks that help circumvent Western sanctions. By imposing sanctions on shadow fleets, the U.S. aims to close loopholes, restrict Russia's energy revenues and strengthen the effectiveness of existing sanctions.
5. **To increase the leverage of U.S. foreign policy:** The legislation combines financial sanctions, energy restrictions and tariff threats, giving the U.S. administration additional economic instruments to influence the behaviour of Russia and countries maintaining significant economic links with it.

What are the major implications of the Graham Act, particularly for India?

1. **Threat to energy security:** India imports over **88% of its crude-oil requirements**, with Russia accounting for a large share (45% of India's crude import). Any significant disruption to Russian supplies could increase India's dependence on alternative suppliers and expose it to higher international oil prices.
2. **Higher import costs and inflationary pressure:** If India has to rapidly substitute Russian crude with more expensive supplies, the resulting increase in energy costs could affect transport, manufacturing, logistics and consumer prices, creating broader inflationary pressures.
3. **Impact on Indian exports to the US:** A U.S. tariff of up to 100% could make Indian products substantially more expensive in the American market, potentially affecting sectors such as electronics, engineering goods, textiles and other export-oriented industries.

4. **India-US trade relations may face additional strain:** The legislation introduces another potential source of friction at a time when India and the U.S. are seeking to expand bilateral trade. India has already warned that the measure could have implications for the bilateral relationship.
5. **Challenge to India's strategic autonomy:** The Act puts pressure on India to align its energy purchases with U.S. geopolitical preferences. This could create a dilemma between maintaining strategic autonomy and preserving relations with a major strategic partner, the USA.
6. **Impact on India-Russia relations:** Pressure to reduce Russian energy purchases could affect India's broader relationship with Russia, including cooperation in defence, nuclear energy, space and other strategic sectors.
7. **Global energy-market implications:** Removing a major buyer such as India from the Russian oil market could disrupt global supply chains and potentially push up crude prices. India has specifically highlighted the possible implications for the international energy market.

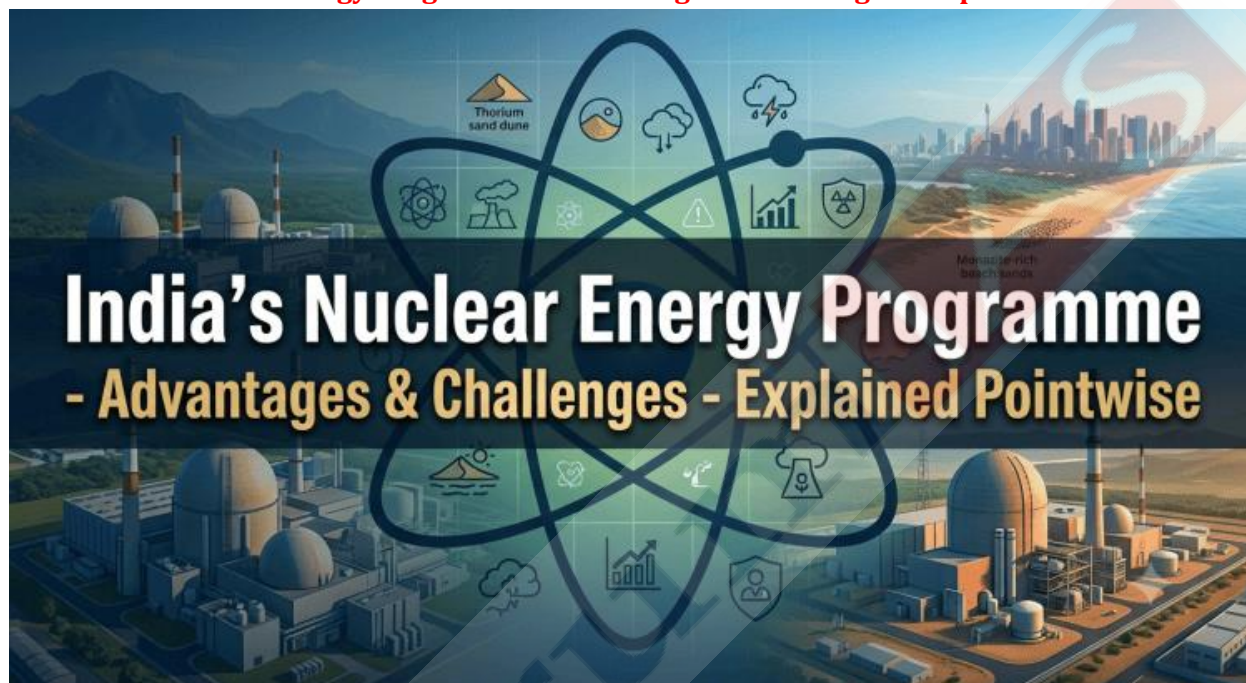
What should be the way forward?

1. **Pursue diplomatic engagement:** India should engage proactively with the USA to seek exemptions or a calibrated application of the Graham Act, highlighting its energy-security concerns and the broader impact of sanctions on global energy markets. Simultaneously, India should maintain dialogue with Russia to ensure stable and predictable energy supplies.
2. **Diversify energy sources:** India should reduce excessive dependence on any single country for crude oil by diversifying imports across the Middle East, Africa and Latin America.
3. **Strengthen strategic petroleum reserves:** India should expand its Strategic Petroleum Reserves (SPRs) to cushion the economy against geopolitical disruptions, sanctions and sudden spikes in global crude prices. Greater storage capacity would provide short-term energy security while allowing India time to diversify suppliers and manage supply shocks.
4. **Accelerate clean-energy transition:** India should accelerate the shift towards renewable energy, nuclear power, green hydrogen and electric mobility, while improving energy efficiency. This would reduce dependence on imported fossil fuels, strengthen energy security and limit India's vulnerability to geopolitical disruptions and external sanctions.
5. **Diversify export markets:** India should expand exports to Europe, ASEAN, Africa, West Asia and Latin America to reduce excessive dependence on the US market. Greater geographical diversification would enhance export resilience, protect domestic industries and reduce vulnerability to unilateral trade restrictions.
6. **Use multilateral platforms:** India should use forums such as the **G20, BRICS, WTO and SCO** to highlight the wider economic and energy-security implications of unilateral sanctions, advocate predictable trade rules, and promote dialogue-based solutions to geopolitical disputes.
7. **Maintain strategic autonomy:** India should pursue an independent, interest-based foreign policy without aligning completely with any major power bloc. It should engage constructively with the US, Russia and other partners, while prioritising its energy security, economic interests and national sovereignty.

UPSC GS-2: International Relations

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India's Nuclear Energy Programme – Advantages & Challenges – Explained Pointwise



India's top nuclear scientist Anil Kakodkar has advocated the early introduction of thorium-based fuel into the indigenous pressurized heavy water reactor (PHWR) fleet, while continuing in parallel with 3-stage nuclear programme, to speed up the utilisation of the country's abundant thorium reserves.

Earlier this year, 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.

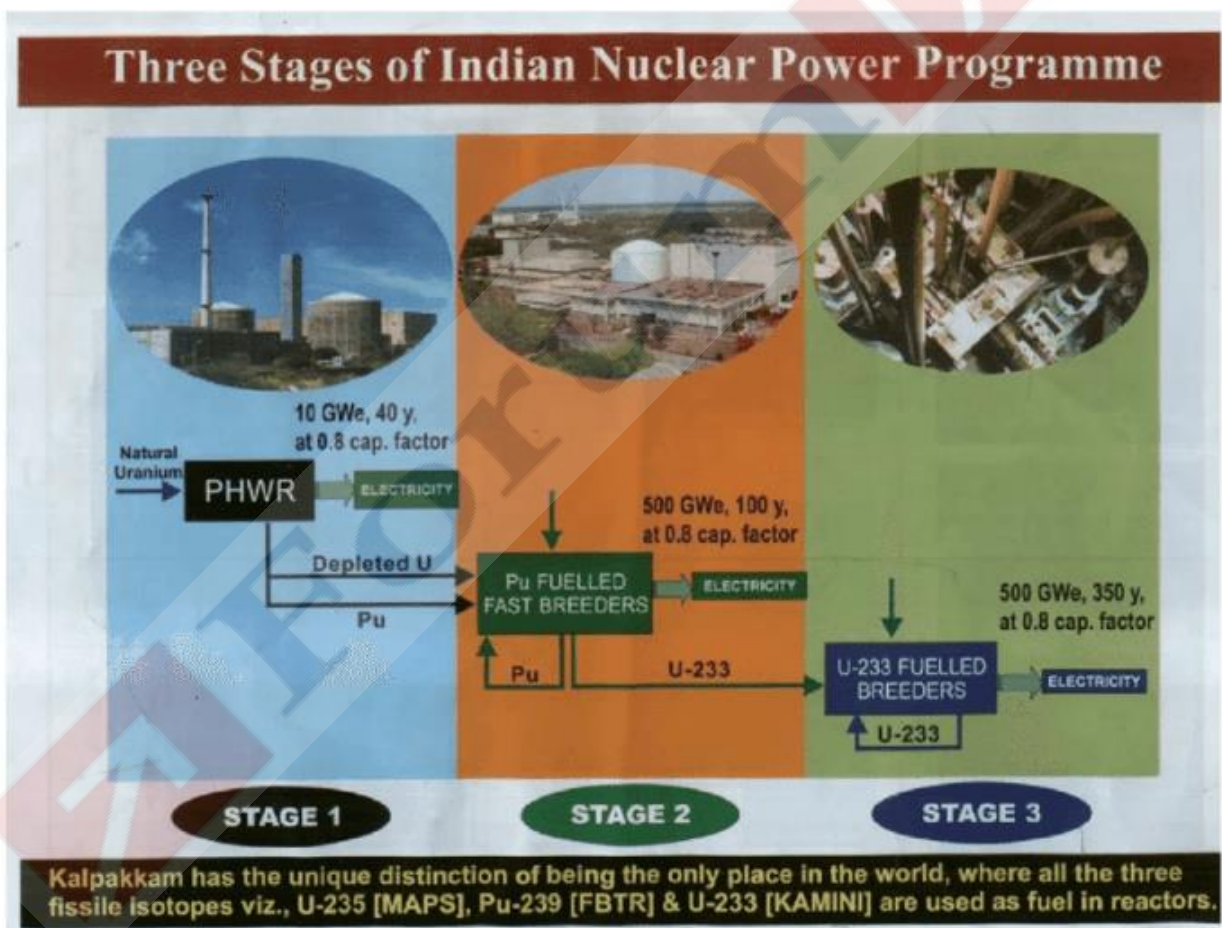
What is India's three-stage nuclear energy program?

- The roadmap of India's three-stage nuclear program was envisioned by **Dr. Homi J Bhabha** in 1954. It is a long-term strategy designed to achieve national energy independence.
- The program had been conceived with the ultimate objective of utilising the country's vast reserves of **thorium-232**.
- It was designed to overcome India's **limited uranium resources** by eventually utilizing its abundant **thorium reserves** (India holds **less than 2% of the world's uranium reserves**, but possesses nearly **25% of global thorium reserves** (found in monazite beach sands)).
- It is based on a **closed nuclear fuel cycle**, where the spent fuel from one stage becomes an important input for the next.

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. Natural Uranium → PHWR → Plutonium ● India has successfully established indigenous expertise in the design, construction and operation of PHWRs, meaning Stage 1 has effectively reached the industrial domain.
Stage II	● 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. ● Plutonium → Fast Breeder Reactor → Uranium-233 ● A major milestone was achieved when India's indigenous 500 MWe Prototype Fast Breeder Reactor (PFBR) at Kalpakkam attained first criticality in April 2026, marking India's entry into Stage 2.
Stage III	● Fuel used: Uranium-233 derived from thorium. ● Thorium-232 itself is not directly fissile, it is converted into fissile Uranium-233 through nuclear reactions. ● In this stage Pu-239 with Thorium-232 (Th-232) are combined 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. ● Uranium-233 +Thorium→ Thorium-based reactors (AHWR)→ Long-term nuclear energy



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

- 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 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.
- 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**.

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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:

1985	Dhruva research reactor became operational: The indigenous Dhruva reactor at BARC strengthened India's capabilities in research, isotope production and nuclear science.
1987	Nuclear Power Corporation of India Limited (NPCIL) was established as a public sector undertaking responsible for the generation of electricity from nuclear power.
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.
2008	India received the NSG waiver: The Nuclear Suppliers Group granted India a waiver for civil nuclear trade, opening avenues for international nuclear cooperation despite India not being a party to the Nuclear Non-Proliferation Treaty (NPT).
2013	Kudankulam Nuclear Power Plant began commercial operation, marking a major expansion of India's nuclear power capacity through Indo-Russian cooperation.
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.
2025	Nuclear Energy Mission announced: The Union Budget 2025-26 announced a ₹20,000 crore outlay for the development of Small Modular Reactors (SMRs), with a target of at least 5 indigenously developed SMRs operational by 2033. India also set an ambition of 100 GW nuclear capacity by 2047.

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, marking India's entry into the second stage of its 3-stage nuclear power programme.



Source- World Nuclear Association

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.

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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

- Decarbonisation of Power Sector:** Nuclear power produces electricity with very low operational greenhouse gas emissions. It can complement solar and wind energy by providing firm, round-the-clock electricity, supporting India's climate commitments and net-zero target.
- 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.
- 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.
- Ensures Reliable Base-Load Power:** Nuclear power plants can operate continuously for extended periods, irrespective of weather conditions. They can help meet India's growing electricity demand and complement the variable output of renewable energy sources.
- Utilisation of Abundant Thorium Reserves:** India possesses significant thorium resources, particularly in monazite-bearing beach sands. The 3-stage programme aims to convert thorium-232 into fissile uranium-233, creating a potential long-term domestic nuclear fuel resource.
- Strengthens Technological Self-Reliance:** Indigenous development of Pressurised Heavy Water Reactors (PHWRs), fast breeder reactors and advanced nuclear technologies strengthens India's capabilities in reactor design, fuel fabrication, reprocessing and nuclear engineering.
- Supports Industrial and Economic Development:** The nuclear programme stimulates demand for high-precision manufacturing, heavy engineering, specialised materials, electronics and scientific instrumentation. It can generate skilled employment and strengthen India's advanced manufacturing ecosystem.
- Promotes Strategic Autonomy:** Domestic nuclear capabilities reduce vulnerability to external technology restrictions and fuel-supply disruptions. They also strengthen India's strategic autonomy in a sector closely linked to national security and critical infrastructure.

What are the challenges to India's Nuclear Energy Programme?

- High capital cost and financing constraints:** Nuclear power plants require massive upfront investment, long construction periods and extended payback timelines.. There have been cost over runs in recently built nuclear power plants.
- Delays in project execution:** Nuclear projects often face delays due to complex engineering, regulatory clearances, equipment procurement and commissioning requirements. The long gestation period can escalate costs and postpone electricity generation.

3. **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.
4. **Nuclear Safety:** Local communities in India have been resisting nuclear reactors due to fears of nuclear disasters like Chernobyl, 1986 or Fukushima, 2011. **For e.g.** Locals protesting against the Mithi viridi nuclear project in Gujarat.
5. **Nuclear Liability Concerns:** 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.
6. **Limited private sector participation:** The Atomic Energy Act, 1962, historically reserved nuclear power generation primarily for government entities, restricting private sector involvement. However, recent reforms have begun to enable greater, albeit limited, private participation in the sector.
7. **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.
8. **Use of outdated technology:** Currently operational Indian nuclear reactors have become outdated and suffer from multiple operational problems. **For e.g.** 6 VVER (water-water energy reactor) design reactors encountering operational problems at Kudankulam.
9. **Dependence on imported technology and components:** Despite significant indigenous capabilities, India continues to depend on foreign technology and suppliers for certain reactor systems, specialised components and fuel-cycle inputs. This can expose projects to supply disruptions, export restrictions and geopolitical uncertainties.

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 e.g.** 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).
7. **Attract Private & Captive Investment:** Mobilize domestic private capital and foreign investment to fund capital-intensive builds. Commercial models like public-private partnerships (PPPs) can help build dedicated nuclear plants for energy-intensive industries (e.g. green hydrogen, steel, data centers).

Conclusion: India's nuclear energy programme offers a unique, self-reliant blueprint for clean power. By leveraging vast thorium reserves, fostering private-sector participation, and deploying advanced breeder reactors, India is securing sustainable, baseline energy essential for its Net-Zero 2070 goal.

Read More: [Indian Express](#)

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

Article 371 & Special Constitutional Safeguards for Ladakh – Significance & Challenges – Explained Pointwise

The Centre has proposed the insertion of a new **Article 371K** in the Constitution to provide special constitutional safeguards for Ladakh. The proposal follows an “in-principle understanding” between the Ministry of Home Affairs and representatives of the Leh Apex Body and Kargil Democratic Alliance to establish a directly elected UT-level body with legislative, executive, financial and planning powers. In this context, it is important to understand Article 371 and the implications of extending a special constitutional framework to Ladakh.

What is Article 371?

- Article 371 is a constitutional provision that enables the Centre to provide special provisions for certain States in India, taking into account their unique historical, social, cultural, administrative and developmental circumstances.
- It aims to address regional aspirations, protect the interests of local communities, promote balanced development and ensure effective governance while maintaining India's constitutional framework.
- It is part of Part XXI of the Constitution, titled **Temporary, Transitional and Special Provisions**.

Core Objectives of Article 371:

1. **Safeguard Indigenous & Tribal Rights:** Protecting customary laws, socio-religious practices, and land ownership rights of indigenous communities, particularly in the Northeast, from Parliamentary interference without the consent of the State Legislature.
2. **Bridge Regional Economic Disparities:** Setting up dedicated development boards and ensuring quota allocations in local jobs and higher education for underdeveloped areas.
3. **Ensuring Political and Administrative Stability:** Facilitating smooth political and administrative transitions during the integration of regions into full statehood, as seen in Sikkim, Nagaland and Mizoram.

Why has the Centre proposed special constitutional safeguards for Ladakh?

1. **Addressing the governance gap after 2019:** Following the Jammu and Kashmir Reorganisation Act, 2019, Ladakh became a Union Territory, but without a legislature. While this arrangement provides for direct administration by the Union, it has also raised concerns about limited local participation in policymaking and decision-making. Special constitutional safeguards under the proposed Article 371K could provide greater institutional protection for local interests.
2. **Protection of tribal identity and culture:** Ladakh has a predominantly tribal population (**over 90%**). Constitutional safeguards could protect its distinct languages, customs, traditions and cultural heritage from external pressures.
3. **Safeguarding land ownership rights:** Ladakh's communities have expressed concerns that unregulated transfer or acquisition of land by outsiders could weaken local ownership and affect the traditional livelihoods of tribal communities. Special constitutional safeguards could provide a

framework to regulate land transfers, protect community-owned land and give greater legal protection to customary land-use practices.

4. **Protection of local employment:** Special constitutional safeguards could enable the creation of mechanisms to reserve or prioritise certain government jobs for local residents. It will protect employment opportunities for local youth from excessive competition with applicants from outside the region.
5. **Responding to demands for greater autonomy:** The proposal seeks to address longstanding demands raised by the Leh Apex Body (LAB) and Kargil Democratic Alliance (KDA), including greater local self-governance and constitutional protection.
6. **Preservation of fragile Himalayan ecology:** Constitutional protection of land, forests, natural resources and the environment could help address concerns regarding unregulated development in Ladakh's ecologically sensitive region.

What are the major challenges in providing constitutional safeguards to Ladakh?

1. **Balancing local aspirations and national interests:** Ladakh has significant strategic importance due to its borders with China and Pakistan. Safeguards must protect local interests while ensuring that national security and strategic infrastructure are not constrained.
2. **Balancing Leh and Kargil interests:** Ladakh comprises two distinct regions – **Leh** and **Kargil** – with differences in geography, demography, culture and political aspirations. Designing an arrangement acceptable to both can be challenging.
3. **Administrative complexity:** Providing special constitutional safeguards to Ladakh could create overlapping institutional jurisdictions if the powers of the Union Territory administration, Lieutenant Governor, Hill Development Councils and any proposed new constitutional body are not clearly defined.
4. **Protecting local employment while attracting investment:** Strong restrictions on employment or investment by outsiders could protect local opportunities but may also affect the availability of skills, capital and private investment.
5. **Balancing autonomy with administrative efficiency:** Greater local decision-making can strengthen participation, but excessive fragmentation of authority may complicate coordinated governance and implementation.
6. **Ensuring effective implementation:** Constitutional protection by itself may not guarantee better outcomes. It would need to be supported by clear legislation, capable institutions, adequate finances and effective accountability mechanisms.

What should be the way forward?

1. **Clearly define institutional powers:** The proposed constitutional arrangement should clearly demarcate the powers of the UT administration, autonomous councils and local representative institutions to avoid administrative overlap.
2. **Protect land and employment:** The constitutional framework should provide clear safeguards for land ownership, transfer and use to protect the interests of local and tribal communities while allowing essential public infrastructure and responsible private investment. Similarly, appropriate provisions for local employment and skill development can improve opportunities for Ladakhi youth without restricting the investment, entrepreneurship or access to specialised skills required for the region's development.
3. **Strengthen local self-governance:** The proposed constitutional safeguards should be accompanied by greater devolution of powers, functions and financial resources to local institutions in Ladakh. Local

bodies should have a meaningful role in decisions relating to land use, local development, tourism, employment, culture and natural-resource management.

4. **Ensure equitable regional development:** Special constitutional safeguards should ensure that development benefits reach both Leh and Kargil in a balanced manner, rather than being concentrated in a few urban or tourist centres. Resource allocation should consider differences in population, geography, infrastructure gaps and socio-economic needs.
5. **Adopt an environment-sensitive development model:** Ladakh's cold desert ecosystem, limited water availability and vulnerability to climate change make environmentally sustainable development particularly important. Development policies should therefore be based on carrying-capacity assessments, especially for tourism, construction and urban expansion.

Conclusion: The proposed constitutional safeguards for Ladakh provide an opportunity to reconcile local aspirations with development and national interests. However, the framework should be carefully designed so that it not only increases the public participation in the governance, but also protect the land, culture, livelihood & fragile ecology of the cold desert.

UPSC GS-2: Polity

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Election Commission of India (ECI) – Roles, Responsibilities & Limitations – Explained Pointwise



A recent investigation by a leading newspaper has brought renewed attention to the internal functioning and decision-making process of the Election Commission of India (ECI). According to the investigation, Election Commissioners Sukhbir Singh Sandhu and Vivek Joshi reportedly recorded objections at least 14 times over the past 10 months regarding decisions and orders connected with the Special Intensive Revision (SIR), including voter registration, deletion and restoration of names and electoral-roll management.

What is the Election Commission of India (ECI) & What are its constitutional status and composition?

- The **Election Commission of India (ECI)** is an autonomous, permanent **constitutional body** established on January 25, 1950, responsible for supervising, directing and controlling elections to Parliament, State Legislatures, and the offices of the President and Vice-President.
- It is a **permanent constitutional body** and derives its authority directly from the Constitution.
- Since October 1993, the ECI is a **three-member body** comprising the CEC and two Election Commissioners.

Constitutional Status:

- **Part XV (Articles 324–329):** Governs the electoral system in India.
- **Article 324** of the Constitution provides for the establishment of the ECI.

Composition:

- Under **Article 324**, the ECI consists of:
 - **Chief Election Commissioner (CEC)**
 - Such number of **Election Commissioners (ECs)** as the President may determine from time to time.
- The **President appoints** the CEC and other Election Commissioners, subject to the law made by Parliament. Currently, appointments are governed by the **Chief Election Commissioner and Other Election Commissioners Act, 2023**.
- When other Election Commissioners are appointed, the **CEC acts as the Chairperson** of the Commission.
- The Commission may also have **Regional Election Commissioners**, who may be appointed by the President after consultation with the ECI.
- **Tenure: 6 years** or until attaining the age of **65 years**, whichever occurs earlier.
- All Election Commissioners enjoy **equal voting rights and equivalent status**, with decisions of the Commission taken by **majority**.
- They are entitled to salary and other conditions of service equivalent to those of a **Judge of the Supreme Court of India**.

What are the major roles and responsibilities of the Election Commission of India (ECI)?

Administrative Functions & Responsibilities	1. Delimitation & Constituencies: Determines the territorial boundaries of electoral constituencies across the country based on the Delimitation Commission Acts. 2. Electoral Rolls & EPIC: Prepares, updates, and periodically revises the voter list (electoral roll) to register all eligible citizens and issue Electronic Photo Identity Cards (EPIC). 3. Election Schedule & Operations: Formulates and announces the dates and schedules for elections, receives and scrutinizes candidate nomination papers, and manages polling stations and counting centers. 4. Registration of Political Parties: Grants official recognition to political parties and classifies them as National or State parties based on their poll performance. 5. Symbol Allocation: Allots official election symbols to recognized political parties and independent candidates.
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	6. Model Code of Conduct (MCC): Enforces the MCC during elections to ensure a level playing field, preventing the misuse of official machinery, state resources, or corrupt campaign practices by political parties and candidates. 7. Monitoring Campaign Expenditure: Sets ceiling limits for candidate campaign spending and monitors expenditures to curb the influence of money power in elections. 8. Poll Control & Cancellation: Vested with the power to cancel or postpone polls in cases of booth-capturing, widespread violence, rigging, or operational irregularities.
Advisory Functions	1. Disqualification of MPs: Advises the President of India on matters concerning the post-election disqualification of sitting Members of Parliament (MPs). 2. Disqualification of MLAs: Advises the Governors of respective states regarding the post-election disqualification of sitting Members of Legislative Assemblies (MLAs). 3. President's Rule & Elections: Advises the President whether elections can be held in a state under President's Rule to determine if the state emergency can be extended beyond one year.
Quasi-Judicial Functions	1. Party Recognition & Symbol Disputes: Acts as a court to hear and settle disputes relating to the recognition of political parties or rival claims to party names and symbols (e.g. party splits or mergers). 2. Candidate Disqualifications: Recommends the disqualification of candidates found guilty of corrupt election practices by the High Courts or Supreme Court. 3. Non-submission of Expense Accounts: Exercises the power to disqualify candidates who fail to lodge their election expenditure accounts within the prescribed time and format.

What are the key powers of the Election Commission of India under the Constitution?

- 1. Superintendence, direction and control of elections:** The ECI has overall constitutional authority to supervise and manage elections to Parliament, State Legislatures, and the offices of the President and Vice-President.
- 2. Preparation of electoral rolls:** It supervises the preparation and revision of electoral rolls and ensures that electoral rolls are properly maintained.
- 3. Appointment of election officials:** The ECI can require the necessary staff and personnel for conducting elections and exercises control over election-related officials during the electoral process.
- 4. Fixing the election schedule:** It determines the election programme, including the timing of various stages of elections, subject to the statutory framework.
- 5. Regulating electoral conduct:** The ECI monitors compliance with the **Model Code of Conduct** and can issue directions to maintain a level playing field during elections.
- 6. Countermanding or postponing polls:** In appropriate circumstances provided by law, the ECI can order adjournment or fresh polling where serious electoral irregularities, violence or other disruptions affect the integrity of the poll.

7. **Residual powers under Article 324:** Where legislation is silent or inadequate, the Supreme Court has recognised that the ECI can exercise plenary powers under Article 324, provided such action is consistent with the Constitution and existing law.

What are the major limitations & criticisms of the Election Commission of India (ECI)?

1. **Appointment-related concerns:** The method of appointing Election Commissioners has been debated in the context of institutional independence. The current statutory framework provides for a selection committee comprising the Prime Minister, a Union Cabinet Minister nominated by the Prime Minister and the Leader of Opposition in the Lok Sabha.
2. **Post-Retirement Appointments:** The absence of restrictions on CECs and Election Commissioners accepting government or political appointments after retirement may raise concerns about potential conflicts of interest and the perceived independence of the Commission.
3. **Unequal removal protection:** Under Article 324(5), the CEC enjoys protection similar to a Supreme Court judge regarding removal, while other Election Commissioners can be removed by the President only on the recommendation of the CEC. The ECI itself has previously advocated stronger constitutional protection for all its members.
4. **Dependence on government machinery:** The ECI relies considerably on central and state government officials and administrative machinery for conducting elections, which can raise questions about operational autonomy.
5. **Limited control over political parties:** Although the ECI can register and recognise political parties and regulate aspects of their electoral conduct, its powers over internal democracy, organisational functioning and political-party finances remain limited by the existing legal framework.
6. **Non-statutory Model Code of Conduct:** The MCC is an important mechanism for maintaining a level playing field, but much of it does not have the status of a standalone statute. The ECI therefore often relies on existing election laws and its constitutional powers for enforcement.
7. **Challenges in regulating election expenditure:** Monitoring actual campaign expenditure can be difficult because of the scale of elections, indirect spending and expenditure by political parties and third parties.
8. **Non-Charged Expenditure:** Unlike the salaries of Supreme Court judges or the Comptroller and Auditor General (CAG) – which are directly charged to the Consolidated Fund of India – the ECI's administrative budget relies on parliamentary approval, leaving it financially dependent on the government.
9. **Special Intensive Revision (SIR):** The SIR exercise faced criticism over the large-scale deletion or potential exclusion of voters, with concerns that marginalised and vulnerable groups could be disproportionately affected due to difficulties in verification and documentation requirements. Questions were also raised regarding the transparency of the verification process, the basis for identification of voters and procedural safeguards.

What are the various recommendations made by different commissions & Supreme Court to improve the effectiveness, transparency and accountability of the Election Commission of India (ECI)?

1. **Independent appointment mechanism:**
 - **Tarkunde Committee (1975), Dinesh Goswami Committee (1990), and the Law Commission (255th Report, 2015)** recommended that appointments of the CEC and Election Commissioners (ECs) should be by a multi-member collegium consisting of: the Prime Minister, Leader of Opposition in the Lok Sabha, and Chief Justice of India (CJI).
 - **2nd Administrative Reforms Commission (ARC)** recommended adding the Union Law Minister and Deputy Chairman of the Rajya Sabha to the selection panel

- The Supreme Court in **Anoop Baranwal v. Union of India (2023)** directed that, until Parliament enacted a law, the CEC and ECs should be appointed on the recommendation of a committee comprising the Prime Minister, Leader of Opposition in the Lok Sabha and Chief Justice of India. The Court emphasised the need for a fair, transparent and independent selection process.
- 2. **Strengthen institutional independence:** The **Law Commission's 255th Report (2015)** recommended reforms to strengthen the independence and effectiveness of the ECI. The Commission's electoral-reform work specifically identified strengthening the Election Commission as an important objective.
- 3. **Equal protection for all Election Commissioners:** The **Law Commission (255th Report)** argued for greater security of tenure for Election Commissioners, including protection comparable to that available to the CEC, to reduce the possibility of executive influence.
- 4. **Greater financial autonomy:** The ECI's institutional independence can be strengthened by providing greater financial autonomy, including consideration of charging its administrative expenditure on the Consolidated Fund of India, rather than making it dependent on the annual appropriation process.
- 5. **Statutory backing to the Model Code of Conduct:** The Law Commission and other reform bodies have suggested strengthening the legal framework governing electoral conduct and MCC violations, enabling more effective and timely action against serious violations.
- 6. **Strengthen electoral-roll management:** Electoral-roll revision should combine accuracy with due process, ensuring that eligible voters are not inadvertently excluded. Clear notice, accessible claims-and-objections procedures and effective grievance redressal are important safeguards. The Supreme Court's 2026 decision concerning Bihar's SIR recognised the ECI's power to undertake such revision while examining its statutory and constitutional safeguards.
- 7. **Promote coordination with State Election Commissions:** The 2nd Administrative Reforms Commission recommended an institutional mechanism bringing the ECI and State Election Commissions onto a common platform for coordination, sharing of experience and resources.

Conclusion: One of the objectives of electoral reforms in India should be to strengthen the ECI by making it financially autonomous as well as transparent & accountable. Strengthening the Commission while ensuring appropriate checks and judicial oversight can enhance public confidence in India's electoral democracy.

UPSC GS-2: Indian Polity – Constitutional Bodies

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Drought in India - Causes, Consequences & Mitigation Measures - Explained Pointwise



In Maharashtra, demands for declaring drought have emerged amid concerns over rainfall deficiency, with El Niño-related weather conditions affecting the State's agriculture-dependent economy. Widespread water scarcity has further aggravated the situation, putting additional pressure on farming and rural livelihoods.

What is drought, and what are its major types?

- Drought is a prolonged period of abnormally low rainfall or water availability that results in water scarcity and adversely affects agriculture, ecosystems, livelihoods and human activities.
- Unlike sudden natural disasters like flash floods or earthquakes, a drought develops slowly over months or years, impacting ecosystems, agriculture, and human populations.

Major types of drought:

Meteorological Drought	Occurs when rainfall in a region is significantly below its normal or expected level for a prolonged period.
Hydrological Drought	Occurs when surface and groundwater resources such as rivers, reservoirs, lakes and aquifers fall significantly below normal levels.
Agricultural Drought	Occurs when soil moisture becomes inadequate to meet the water requirements of crops , leading to crop stress and reduced yields.
Socio-economic Drought	Occurs when water scarcity begins to affect the supply of goods and services , including food, drinking water, energy and other economic activities.

Ecological Drought	Occurs when prolonged water scarcity causes stress or damage to ecosystems , affecting biodiversity and ecological functions.
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What are the major causes of drought in India?

1. **Erratic Monsoon:** The Indian monsoon is characterised by considerable spatial and temporal variability. Delayed onset, prolonged dry spells, uneven distribution of rainfall and early withdrawal can create significant water deficits in particular regions.
2. **Monsoon Failure:** As a large part of the country's rainfall is received during the southwest monsoon season. A delayed onset, prolonged breaks, early withdrawal or significant rainfall deficiency can reduce soil moisture, groundwater recharge and reservoir levels. This can adversely affect crop production, drinking-water availability, livestock and rural livelihoods, particularly in rain-fed and drought-prone regions.
3. **El Niño Events:** In India, El Niño conditions are generally associated with a higher probability of below-normal southwest monsoon rainfall, although the impact varies across regions and individual years. Reduced monsoon rainfall can lower soil moisture, reservoir levels and groundwater recharge, thereby increasing the risk of agricultural and hydrological drought.
4. **Climate Change:** Climate change can increase the frequency, duration and intensity of drought conditions by altering rainfall patterns and raising temperatures. Higher temperatures increase evaporation and evapotranspiration, reducing soil moisture and surface-water availability. Changes in monsoon behaviour, including longer dry spells between rainfall events, can further increase drought vulnerability.
5. **Uneven Rainfall Distribution:** India receives most of its annual rainfall during the southwest monsoon, but its spatial and temporal distribution is highly uneven. Some regions may receive adequate or even excess rainfall while others experience prolonged dry spells. Similarly, a long break in monsoon rainfall during the crop-growing season can cause soil-moisture deficiency and crop stress even when seasonal rainfall is close to normal.
6. **Groundwater Over-extraction:** Excessive withdrawal of groundwater can aggravate drought conditions by lowering the water table and reducing the availability of groundwater during dry periods. When extraction exceeds natural recharge, aquifers take longer to recover, reducing water security during prolonged rainfall deficits.
7. **Poor Water Management:** Poor water management can turn rainfall deficiency into a more severe drought situation. Inefficient irrigation methods, excessive groundwater extraction, inadequate rainwater harvesting, poor maintenance of water-storage structures and wastage of water reduce the availability of water during dry periods.
8. **High Agricultural Dependence on Rainfall:** A significant part of Indian agriculture remains dependent on rainfall, particularly the southwest monsoon, due to inadequate irrigation coverage in many regions. Consequently, delayed, deficient or uneven monsoon rainfall can cause soil-moisture stress, crop failure and reduced agricultural productivity. This dependence makes drought-prone regions especially vulnerable to rainfall variability and climate change.
9. **Rapid Urbanisation and Industrialisation:** Rapid urbanisation and industrialisation increase the demand for water for domestic, commercial and industrial purposes, putting immense pressure on already stressed water resources. Unplanned urban growth, groundwater over-extraction, industrial water consumption and the encroachment of lakes and wetlands reduce water availability and groundwater recharge.

What are the socio-economic & environmental consequences of drought in India?

Socio-Economic Consequences:

1. **Agricultural Losses:** Water shortages reduce crop yields, cause crop failures and affect livestock, particularly in rain-fed farming regions.
2. **Food Insecurity:** Declining agricultural production can reduce food availability, increase food prices and worsen malnutrition among vulnerable households.
3. **Rural Distress and Farmer Indebtedness:** Crop losses and declining farm incomes can force farmers to borrow, sell assets or rely on government assistance.
4. **Loss of Livelihoods and Unemployment:** Drought reduces demand for agricultural labour and affects allied sectors, such as dairy, fisheries and agro-based industries.
5. **Distress Migration:** Water scarcity and declining rural employment may compel people to migrate to cities in search of jobs and better livelihood opportunities.
6. **Economic and Fiscal Burden:** Drought-related losses can reduce rural consumption and economic activity while increasing government expenditure on relief, compensation, water supply and employment programmes.

Environmental Consequences:

1. **Groundwater Depletion:** Reduced rainfall and excessive extraction of groundwater for irrigation and drinking purposes can lower water tables and dry up wells.
2. **Degradation of Soil:** Prolonged moisture deficiency reduces soil fertility and biological activity, while dry and exposed soil becomes more vulnerable to erosion.
3. **Desertification and Land Degradation:** Recurrent drought, especially when combined with unsustainable land use, can accelerate desertification and reduce the productive capacity of land.
4. **Loss of Biodiversity:** Water scarcity and habitat degradation threaten terrestrial and aquatic species, disrupt food chains and reduce ecosystem resilience.
5. **Forest Degradation and Wildfires:** Prolonged dry conditions increase vegetation stress and can raise the risk and intensity of forest fires.
6. **Human-Wildlife Conflict:** Scarcity of water and food in natural habitats may drive wildlife closer to human settlements, increasing competition for resources and conflict.

What is the procedure for declaring a drought in India?

- Drought in India is officially declared by respective **State Governments** following the standardized protocols outlined in the Manual for Drought Management issued by the Ministry of Agriculture.
- As water management and disaster relief primarily fall within the purview of the States, India does not have a single, legally binding national definition of drought. Instead, states use a structured, 3-step framework to make the declaration scientific and objective down to the block, tehsil, or taluka level:

Mandatory Indicators (Triggers)	The state checks two mandatory baseline criteria: rainfall deviation (deficiency compared to normal averages) and the presence of a prolonged dry spell .
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Impact Indicators	If the first trigger is met, the state evaluates four core impact categories: ○ Agriculture (crop condition/sown area) ○ Remote sensing vegetation indices (like NDVI) ○ Soil moisture ○ Hydrology (reservoir and groundwater levels) States select three of these four impact indicators (one from each chosen type). If all 3 show severe anomalies, it indicates a severe drought; if 2 show moderate-to-severe levels, it indicates a moderate drought.
Ground Verification	After the initial triggers activate, state authorities conduct physical sample surveys on the ground to verify crop damage, fodder availability, and drinking water shortages. The final field report determines the official severity grade.

- Once verified, the state government issues an official notification detailing the geographic boundaries of the affected areas, which generally remains valid for **6 months** unless extended or withdrawn.
- Issuing the notification activates relief funds from the **State Disaster Response Fund (SDRF)**, triggers crop insurance claims (PMFBY), enables agricultural loan restructuring, and allows the state to submit a memorandum seeking additional assistance from the **National Disaster Response Fund (NDRF)**.

What are the major challenges in drought prediction and management in India?

1. **Microclimate and Rainfall Variability:** The Indian monsoon is highly erratic, making accurate localised forecasting challenging. While predictions may be relatively reliable at the national or state level, block- and district-level forecasts often struggle to capture microclimatic differences and localised dry spells.
2. **Emergence of Flash Droughts:** Flash droughts can develop rapidly within 2-3 weeks due to sudden heatwaves and increased evapotranspiration. Traditional meteorological early-warning systems often struggle to detect these rapid changes in soil moisture, limiting timely preparedness and response.
3. **Political and Administrative Delays in Declaration:** State governments often delay formally declaring a drought due to political reluctance or bureaucratic hurdles in field level assessment. Such delays may postpone the release of emergency financial assistance, relief measures and crop compensation to affected farmers.
4. **Institutional Fragmentation:** Drought management involves multiple Central and State departments, including Agriculture, Jal Shakti, Disaster Management and Rural Development. Overlapping responsibilities and coordination gaps among these institutions can create administrative bottlenecks and affect the timely implementation of drought preparedness and mitigation measures.
5. **Neglect of Traditional Water Storage:** Encroachment, siltation and urbanisation have damaged many traditional water-harvesting systems such as tanks, johads and bawris. Their decline has reduced local water storage and increased vulnerability to prolonged dry spells.

What are the major drought mitigation measures recommended in the NDMA guidelines?

1. **Rainwater Harvesting and Water Conservation:** Promote rooftop rainwater harvesting, farm ponds, check dams, percolation tanks and other local structures to capture and store rainwater.
2. **Integrated Watershed Development:** Adopt watershed-based approaches involving soil-moisture conservation, groundwater recharge, afforestation and treatment of degraded land.

3. **Drought-Resilient Agriculture:** Promote drought-resistant and short-duration crop varieties, crop diversification, mixed farming and climate-resilient agricultural practices.
4. **Efficient Irrigation:**
5. **Groundwater Management:** Implement artificial recharge techniques for depleted aquifers, promote community-based water budgeting, and mandate regulatory controls on deep borewells.
6. **Restoration of Traditional Water Bodies:** Restore and maintain tanks, ponds, johads, bawris and other traditional water-harvesting systems to increase local water-storage capacity.
7. **State Drought Monitoring Cells (DMCs):** Establish dedicated DMCs under State Disaster Management Authorities (SDMAs) to track real-time indicators like rainfall deficit, reservoir levels, and soil moisture.
8. **Drought Early-Warning Systems:** Strengthen monitoring of rainfall, soil moisture, groundwater, reservoir levels and vegetation conditions to provide timely warnings and enable early action. NDMA's current SACHET platform demonstrates the broader emphasis on geo-targeted, technology-enabled disaster warnings.

What measures can be adopted to improve drought resilience in India?

1. **Strengthen Water Conservation:** India needs to strengthen decentralised and community-based water conservation to reduce vulnerability to drought. This includes expanding rainwater harvesting, farm ponds, check dams, percolation tanks and groundwater-recharge structures.
2. **Promote Watershed Development:** Watershed development should be strengthened as a long-term drought-resilience strategy, particularly in rain-fed and drought-prone regions. It involves soil and water conservation, rainwater harvesting, groundwater recharge, afforestation and restoration of degraded land within a watershed.
3. **Promote Climate-Resilient Agriculture:** Promoting climate-resilient agriculture is essential for reducing farmers' vulnerability to drought and erratic rainfall. This includes adopting drought-resistant and short-duration crop varieties, crop diversification, millets, mixed and intercropping systems, micro-irrigation and improved soil-moisture conservation.
4. **Restore Traditional Water Systems:** Reviving traditional water-harvesting structures such as tanks, ponds, johads, bawris and ahars can strengthen local water security in drought-prone regions. These systems capture rainwater, support groundwater recharge and provide water during dry periods.
5. **Improve Drought Forecasting:** India should strengthen high-resolution, location-specific drought forecasting by integrating rainfall forecasts with satellite imagery, soil-moisture data, groundwater levels, reservoir storage and crop-condition indicators. Advanced technologies such as remote sensing, GIS, artificial intelligence and machine learning can help identify emerging drought conditions and flash droughts at the district and block levels.
6. **Strengthen Drought Contingency Planning:** Drought contingency plans should be district-specific, regularly updated and action-oriented, rather than prepared only after drought conditions emerge. They should identify vulnerable areas, water sources and high-risk crops in advance and provide clear measures such as alternative crop planning, changes in sowing schedules, livestock protection, drinking-water arrangements, fodder availability and employment support.
7. **Improve Centre-State Coordination:** Drought management requires effective coordination among the Central Government, State Governments, district administrations and local bodies. A common framework for drought assessment, real-time sharing of rainfall, groundwater and crop data, and clearly defined responsibilities can reduce delays in declaring drought and providing relief.

Conclusion: Drought management in India needs to move beyond a relief-centric approach towards a long-term resilience-based strategy.

UPSC GS-3: Disaster Management; GS-1: Geography
Read More: [Indian Express](#)

Women Safety in India – Challenges & Impact – Explained Pointwise

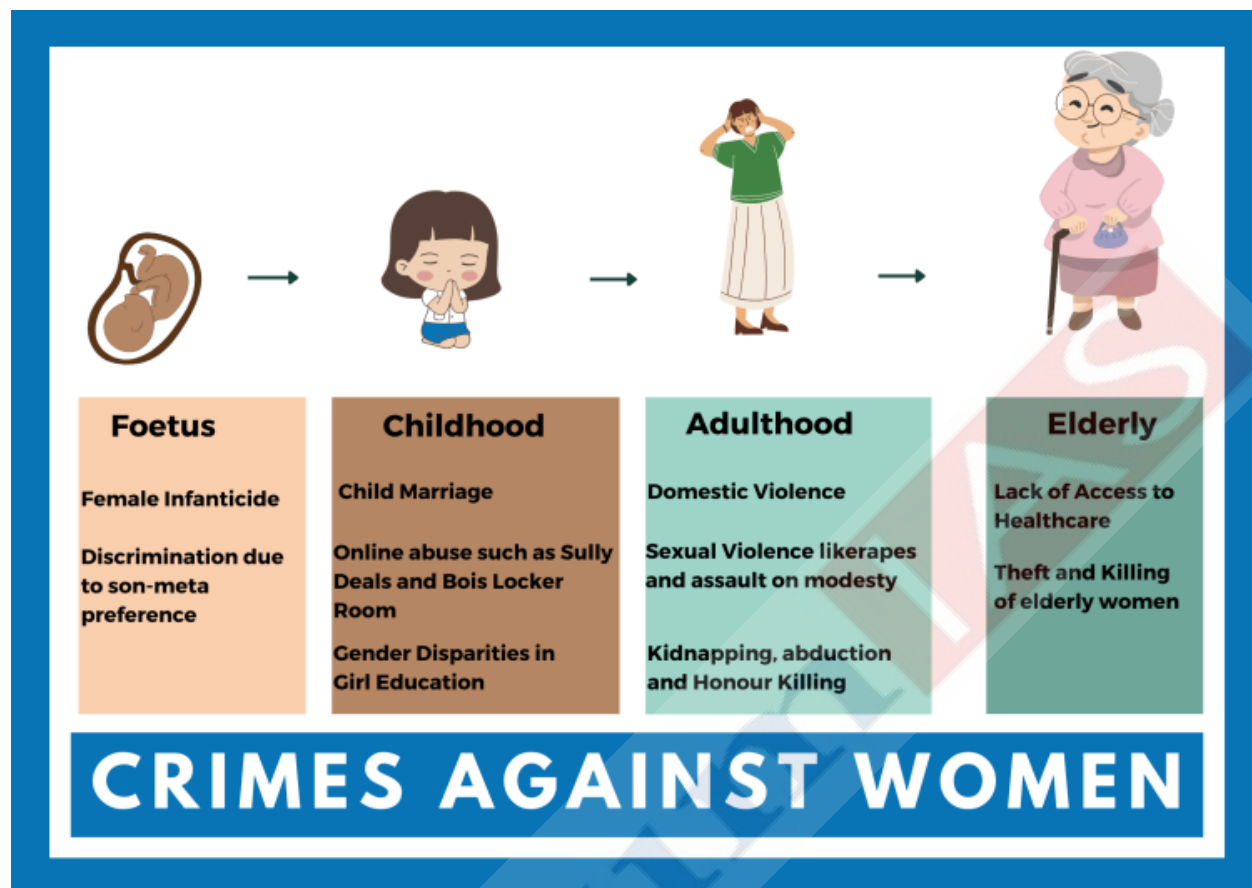


“The day a woman can walk freely on the roads at night, that day we can say that India has achieved independence” - Mahatma Gandhi

Despite advancements in technology and urbanization, women in India continue to face violence and discrimination. It is deeply distressing that nearly 88 rape cases are reported daily in the country, with many more likely going unreported. Our rich cultural heritage and value system have failed to protect the very individuals who are the foundation of society.

What are the safety issues faced by women in India? What are the data regarding women safety in India?

- Women in India face safety challenges across **public spaces, workplaces, homes, digital platforms and transportation**. Major issues include:
 1. **Gender-based violence:** Crimes such as rape, sexual assault, domestic violence, stalking and harassment remain major concerns.
 2. **Domestic violence:** Violence within households, including physical, sexual, emotional and economic abuse, can remain underreported due to social stigma and dependence.
 3. **Sexual harassment in public spaces:** Women may face harassment in streets, markets, educational institutions, workplaces and other public places.
 4. **Unsafe public transport:** Crowding, inadequate surveillance, poorly lit stations and insufficient last-mile connectivity can increase women's vulnerability.
 5. **Cyber harassment:** Women increasingly face cyberstalking, online abuse, impersonation, image-based abuse, doxxing and threats on social media.



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NCRB Report 2023 Data related to crime against women:

1. Increase in crimes against women:

- According to the NCRB Report 2023, **crimes against women** in India has increased by 4% in 2022, with reported cases rising from 4.28 lakh in 2021 to 4.45 lakh in 2022.
- The report indicates that the **crime rate per lakh women population** rose from 64.5 in 2021 to 66.4 in 2022.

2. Crimes against women: The most prevalent types of crimes reported include:

- Cruelty by Husband or His Relatives- 31.4%
- Kidnapping and Abduction of Women- 19.2%
- Assault on Women with Intent to Outrage her Modesty- 18.7%
- Rape- 7.1%

- Women's Safety Indices:** According to the **Women, Peace, and Security Index 2023**, **India ranks 128th out of 177 countries**. The **index score for India is 0.58**, which places it in the fourth quin tile for women's safety.
- National Family Health Survey (NFHS-5):** As per the National Family Health Survey (NFHS-5), around **30% of women in India** between **15-49 years** of age have experienced physical, sexual or domestic violence. The prevalence was around **31% in rural areas compared with 25% in urban areas**.

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What are the reasons behind lack of women safety in India?

1. **Prevalence of patriarchy:** There is deeply entrenched patriarchal culture in India. This perpetuates the belief in male superiority and normalizes violence against women. **For e.g.** Prevalence of 'Ladka hai Galti ho jaati hai mindset' in India.
2. **Objectification of Women:** The degenerated portrayal of women in media and entertainment reduces them to objects. This objectification often leads to increased instances of harassment and violence. **For e.g.** Increased objectification of sexuality in movies.
3. **Cultural Stigma:** Cultural stigmas regarding sexual violence and harassment, leads to underreporting of crimes, many women fear societal backlash on account of reporting of harassment issues. **For e.g.** Brushing off the child molestation issues under the carpet.
4. **Victim-Blaming:** Victims often face social judgment and victim-blaming rather than support. Questions about their clothing, choice of friends, time of outing, use of public spaces or lifestyle choices can shift attention from the perpetrator's responsibility to the victim's behaviour.
5. **Economic Dependency:** Feminization of poverty and high economic dependency on male family members, exacerbate the vulnerability of women. The lack of financial independence, makes it difficult for them to escape domestic abuses. **For e.g.** Increase in cases of domestic violence against housewives.
6. **Lack of Awareness and Education:** Many women in India are unaware of the legal protections available for women, such as the Domestic Violence Act, Sexual Harassment Act. This leads to a culture of violence and abuse against women.
7. **Inadequate safety in public places:** Inadequacies in public infrastructure, such as poorly lit streets, lack of safe transportation options, lack of CCTVs, increase vulnerability of women to crime. **For e.g.** Nirbhaya Rape in a public transportation and Kolkata rape in a public hospital highlights the lack of public safe spaces for women.
8. **Weak implementation of laws:** India has a comprehensive legal framework to protect women, including laws addressing domestic violence, sexual harassment at workplaces, sexual offences, child sexual abuse and trafficking. However, gaps in police response, investigation, prosecution, victim support and institutional compliance can reduce their deterrent effect.
9. **Digital technology and cybercrime:** The rapid expansion of smartphones, social media, digital payments and online communication has created new dimensions of safety risks for women. While digital technology has improved women's access to education, employment and public services, it has also enabled perpetrators to harass, threaten and exploit women remotely and anonymously. **For e.g.** Cyberstalking & online harassment faced by women.

What initiatives have been taken by the Government to prevent crimes against women?

Legal Protection:

Against Child violence	● Prohibition of Child Marriage Act, 2006 ● Juvenile Justice (care and protection of children) Act, 2015 ● The Commissions for Protection of Child Rights Act ● The Protection of Children from Sexual Offences Act, 2012
Against objectification of women	● Indecent Representation of Women (Prohibition) Act, 1986.

Against Sexual Offences	• Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013. • Criminal Law (Amendments), Act 2013 for effective legal deterrence against sexual offences. • Criminal Law (Amendment) Act, 2018 for even more stringent penal provisions including death penalty for rape of a girl below the age of 12 years.
Against Domestic Violence	• Dowry Prohibition Act, 1961 • Protection of Women from Domestic Violence Act, 2005.

Central Government Initiatives:

1. **Establishment of Nirbhaya Fund:** A dedicated, non-lapsable fund was created to finance projects aimed specifically at women's safety and security. It supports initiatives such as ERSS-112, Safe City projects, Women Help Desks, Anti-Human Trafficking Units, forensic facilities and Fast Track Special Courts.
2. **Emergency Response Support System (ERSS-112):** The nationwide **112 emergency number** provides a single point for emergency assistance. It integrates police, fire, health and other emergency services and accepts distress requests through multiple channels.
3. **Women Helpline 181 (WHL):** A toll-free helpline integrated directly with ERSS-112 across states to offer emergency intervention, counseling, and referral services.
4. **Safe City Projects:** Safe City projects use CCTV surveillance, crime-hotspot mapping, command-and-control centres, improved street lighting, women police patrols, panic buttons and safer public infrastructure. Projects have been approved for eight cities: Ahmedabad, Bengaluru, Chennai, Delhi, Hyderabad, Kolkata, Lucknow and Mumbai.
5. **Mission Shakti:** Mission Shakti is the umbrella programme for women's safety, security and empowerment. Its **Sambal** component covers One Stop Centres, Women Helplines, Beti Bachao Beti Padhao and Nari Adalats.
6. **Investigation Tracking System for Sexual Offenses:** MHA has launched it to monitor and track time-bound investigation in sexual assault cases in accordance with Criminal Law (Amendment) Act 2018.
7. **National Database on Sexual Offenders:** MHA has launched it to facilitate investigation and tracking of sexual offenders across the country by law enforcement agencies. NDSO has data of over 5 lakh sexual offenders.
8. **National Cyber Crime Reporting Portal:** The portal provides an online mechanism for reporting cybercrime, with a specific facility for crimes against women and children. It also permits anonymous reporting for specified categories of sexually explicit content.
9. **Establishment of One stop centers:** Scheme of One Stop Centers has been launched to provide integrated support and assistance to women affected by violence.
10. **Scheme for Universalization of Women Helpline:** It has been launched to provide 24 hours emergency and non-emergency response to women impacted by violence.

State Government and other Initiatives:

1. **Mission Shakti:** It has been launched by the **UP government** to make improvements to women's safety, and reduce the consequent violence and exploitation faced by them.
2. **Police pink booths:** Launched by the **Delhi government**, these booths are dedicated to addressing the grievances of women passersby.
3. **Shakti Criminal Laws (Maharashtra Amendment) Act:** The **Maharashtra Assembly** passed the Shakti Criminal Laws (Maharashtra Amendment) Act to approve death penalty for heinous offences of rape and gangrape.
4. **Meri Saheli Initiative:** Launched by the **Railway Protection force**, this initiative ensures security of lady passengers that are traveling by train by a dedicated Mahila officers team.
5. **Online Movements and campaigns:** **#CallItOut because #ItsNotOK campaign, #MeToo movement**, have been launched to facilitate knowledge transfer and coordinate efforts towards the prevention of harassment against women.

What are the challenges in ensuring safety of women despite the legal and policy initiatives?

1. **Under-reporting of crimes:** Social stigma, victim-blaming, fear of retaliation and family pressure may discourage women from reporting violence, particularly domestic and sexual violence.
2. **Under-Representation of Female Officers:** Women make up less than **12% of the total police force** in India, limiting the availability of gender-sensitive personnel at entry points.
3. **Delayed Justice:** The inefficiencies of the justice system, such as prolonged legal processes and lenient punishments for sexual offenders, undermines public confidence in law enforcement.
4. **Laxity in conviction procedure:** 39% of officers believe complaints of gender-based violence are baseless. Prevalent culture of prompt registration of FIRs, lack of time-bound investigations and ineffective collection of forensic evidence in sexual assault cases, lead to inordinate delays in conviction of sexual harassment cases.
5. **Implementation Gap:** SC has called out the 'authorities/management/employers' for failing to ensure a "safe and secure work place" for women. It has been observed that the implementation of the Sexual Harassment of Women at Workplace (Prevention, Prohibition, Redressal) Act, 2013, has been half-hearted.
6. **Ineffective utilisation of public funds:** Even though the budgetary allocation of the Nirbhaya Fund has increased by 100% between 2013 to 2022, less than half of the allocation to the fund has been used.
7. **Challenges in cybercrime enforcement:** Cyberstalking, online harassment, impersonation, deepfakes and image-based abuse can spread rapidly, while identifying perpetrators and preserving digital evidence can be difficult.
8. **Rural and regional disparities:** Access to police stations, courts, forensic facilities, helplines, shelters and counselling services is not uniform across the country.

What are the implications of prevailing attitudes and crimes against women?

1. **Restriction of women's freedom and mobility:** Fear of sexual harassment, assault, stalking and other forms of violence can significantly restrict women's freedom to move and participate in public spaces. Over time, such restrictions can reduce women's access to education, employment, healthcare, political participation and social opportunities.
2. **Dissuades women from entering the workforce:** Concerns about workplace harassment, unsafe transportation and commuting can discourage women from entering or remaining in paid employment, resulting in underutilisation of India's female workforce. At the macro level, exclusion of women from economic activity limits India's growth potential.

3. **The “Pink Tax” on Safety:** Women spend significantly more money than men on safer transport options for e.g. opting for auto-rickshaws or cabs over cheaper public buses and trains, or renting apartments in expensive, gated localities purely for security.
4. **Impact on education:** Families may restrict girls from travelling alone, attending institutions located far from home or participating in activities outside regular hours due to safety concerns. These concerns can contribute to absenteeism, early discontinuation of education and reduced participation in higher education.
5. **Reinforcement of patriarchal norms:** Prevailing attitudes towards crimes against women can reinforce patriarchal norms by placing greater emphasis on regulating women’s behaviour than on holding perpetrators accountable. Such attitudes normalise restrictions on women’s freedom, reinforce traditional gender roles and weaken women’s agency.
6. **Physical and Mental Health Consequences:** Victims of sexual violence experience severe physical injuries, which can lead to long-term health issues such as chronic pain, reproductive health problems, and increased susceptibility to sexually transmitted infections (STIs) including HIV.
7. **Impact on Families and Children:** Children who witness violence against their mothers often face the risk of developing emotional and behavioral problems. They may also become victims of abuse themselves, perpetuating a cycle of violence across generations.
8. **Digital exclusion:** Cyberstalking, online abuse and threats can cause women to withdraw from social-media and digital platforms, limiting their access to education, networking, entrepreneurship and public expression.
9. **Challenge to India’s development goals:** Persistent insecurity undermines gender equality, women’s economic empowerment and inclusive development, making women’s safety an important component of India’s demographic and economic dividend.

What Should be the Way Forward?

1. **Ensure effective implementation of laws:** India has a comprehensive legal framework to protect women, but effective implementation is essential for converting legal rights into actual safety. The focus should be on strengthening the entire justice chain – from reporting and investigation to prosecution, trial and victim support.
2. **Police reforms:** There should be gender focused recruitment and training in police. Rapidly scale up female recruitment to meet the recommended target of **at least 33% female representation** across all ranks in state police forces.
3. **Judicial reforms:** There should be establishment of Fast track courts and enhanced punishment in grave cases like rape, as recommended by Justice Verma Committee. Further, the women representation in judiciary must be enhanced.
4. **Training and capacity building:** Manpower training and skill building programs for Investigation Officers, Prosecution Officers and Medical Officers must be stepped up. Gender-sensitive training and monitoring in criminal law procedures must be promoted to ensure that staff handle cases with a trauma-informed approach.
5. **Make public spaces safer:** Public safety should be integrated into urban planning, transport systems and local governance rather than relying only on policing after an incident occurs. Authorities should conduct regular gender-sensitive safety audits to identify poorly lit streets, isolated areas and crime hotspots.
6. **Establishment of Rape Crisis Centres:** Rape Crisis Centres like in countries like Australia, Canada, America, United Kingdom, etc, can be set up in India. These centres can provide the rape victims with medical help, counselling, and financial help by way of providing job opportunities etc.

7. **Sensitivity on part of Media:** The media must be sensitive to the plight of the rape victim and must not highlight the name or any inference leading to the identification of the victim. The media must highlight those cases where the offender has been convicted, as it will infuse the feeling of deterrence among the people.
8. **Promote gender sensitisation from an early age:** Gender sensitisation should begin in schools and families, where attitudes towards gender roles are formed. Children should be taught gender equality, mutual respect, consent, personal boundaries and dignity, along with the rejection of stereotypes that portray women as subordinate or responsible for preventing their own victimisation.

Conclusion: India needs to bridge the gap between laws and their implementation while transforming patriarchal attitudes, strengthening institutions and creating safer physical and digital spaces. A whole-of-society approach involving government, families, educational institutions, communities and citizens can help ensure that women can exercise their rights, mobility and opportunities with dignity and security.

Read More- [The Indian Express](#)

UPSC Syllabus- GS1 Issues related to Women

India's Nuclear Doctrine – Advantages & Challenges – Explained Pointwise



India's nuclear doctrine – Advantages & Challenges – Explained Pointwise

India's nuclear doctrine, formally articulated in 2003, has remained largely unchanged for over two decades, with key principles such as credible minimum deterrence, No-First-Use and civilian control at its core. However, evolving security challenges and emerging technologies necessitate an assessment of whether the doctrine remains adequate for India's contemporary strategic environment.

What are the key features of India's Nuclear Doctrine?

The core principles of India's nuclear doctrine were articulated by the **Cabinet Committee on Security** in **2003** and continue to be reaffirmed by the Government.

Key features of India's Nuclear Doctrine are:

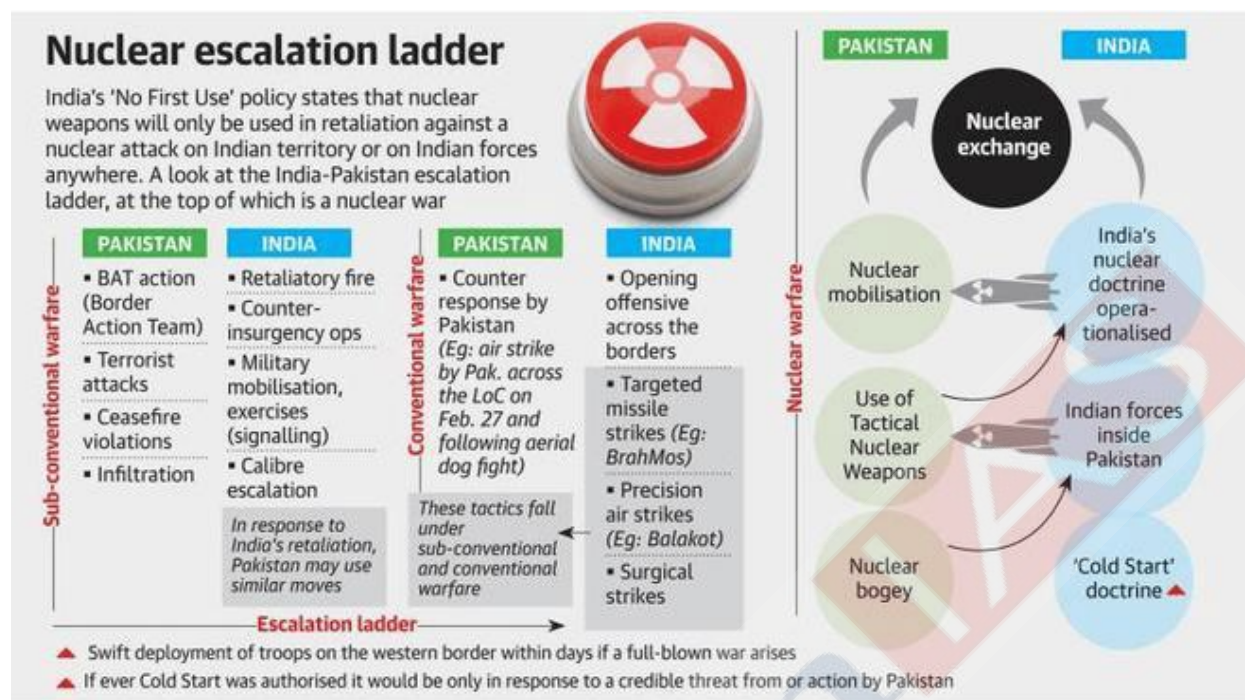
- **No First Use (NFU):** India committed to not being the first to use nuclear weapons in a conflict but would retaliate if attacked with such weapons.
- **Credible Minimum Deterrence:** India would maintain a sufficient number of nuclear weapons to deter a nuclear attack, but it would not seek to match other countries' arsenals in size.
- **Non-use Against Non-Nuclear Weapon States:** India would not use or threaten to use nuclear weapons against countries that do not possess them.
- **Retaliation to a Nuclear Attack:** If India is subject to a nuclear attack, it would retaliate, causing massive damage to the aggressor.
- **Civilian Political Control:** The authority to order nuclear retaliation rests with the civilian political leadership through the **Nuclear Command Authority (NCA)**. This ensures that nuclear weapons remain under strong political control.
- **Commitment to Nuclear Disarmament:** India supports **universal, non-discriminatory and verifiable nuclear disarmament** and advocates the eventual elimination of nuclear weapons globally.

What is the evolution of India's nuclear doctrine?

- **Origin of India's Nuclear Doctrine:** India's nuclear doctrine originated in the years following its first nuclear test in 1974, which was termed as a 'peaceful nuclear explosion.' However, the real evolution of its nuclear doctrine began after the 1998 nuclear tests, when India declared itself a nuclear weapon state.
- **Draft Nuclear Doctrine (1999):** Following the 1998 tests, the National Security Advisory Board (NSAB) of India released a Draft Nuclear Doctrine in 1999. This draft provided the basic framework of India's nuclear policy, emphasizing a policy of 'No First Use' (NFU) and asserting that nuclear weapons would only be used for retaliation against a nuclear attack.
- **Official Nuclear Doctrine (2003):** In 2003, the Indian government reviewed and released the official nuclear doctrine. It retained the core principles of the 1999 draft but added more details. The 2003 doctrine emphasized "Credible Minimum Deterrence," reasserted the 'No First Use' policy, and stated that India would not use nuclear weapons against non-nuclear weapon states.

Current Debates: Given the evolving regional security environment, especially the growing nuclear capabilities of China and the persisting threat from Pakistan, there are ongoing debates in India about whether changes or clarifications to the nuclear doctrine are necessary. Some argue for a review of the 'No First Use' policy, while others believe that the principle of 'Credible Minimum Deterrence' might need to be reinterpreted in the face of new threats.

What are the advantages of India's nuclear doctrine?



Source: The Hindu

1. **Credibility and Clarity:** India's nuclear doctrine provides a clear and credible stance on the country's position regarding the use of nuclear weapons. The "No First Use" policy clearly signals that India views nuclear weapons primarily as a deterrent and not as an offensive tool, which contributes to regional stability.
2. **Promotes peace and stability:** The doctrine, particularly the "No First Use" and "Non-use Against Non-Nuclear Weapon States" provisions, contributes to regional and global peace and stability. These principles assure non-nuclear weapon states that they will not be threatened or attacked with nuclear weapons by India.
3. **Supports Disarmament Goals:** The "Credible Minimum Deterrence" stance aligns India with global disarmament goals and reduces the chances of a costly arms race. India maintains that its nuclear capability is a security necessity rather than an endorsement of permanent nuclear weapons.
4. **Reinforces India's Responsible Image:** The doctrine's principles, especially the "No First Use" policy and "Non-use Against Non-Nuclear Weapon States", reinforce India's image as a responsible nuclear power. This has strategic benefits for India in terms of its international standing and relations with other countries.
5. **Mitigates the Risk of Accidental Nuclear War:** The doctrine's "No First Use" policy reduces the risk of an accidental nuclear war, as it removes the pressure for a rapid decision to launch in a crisis. This allows for a more measured response, potentially averting catastrophe.
6. **Enhances India's strategic autonomy:** An independent nuclear deterrent reduces India's dependence on external security guarantees and provides greater freedom in pursuing an independent foreign policy.

What are the challenges raised against India's nuclear doctrine?

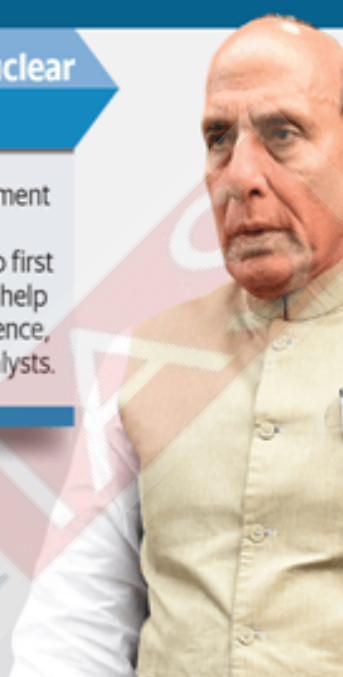
MINT GRAPHITI

NUCLEAR REACTION

The Indian position	The Pakistani doctrine	The new nuclear option
NEW DELHI has held that it will not be the first to initiate a nuclear strike, but will retaliate should deterrence fail.	ISLAMABAD does not espouse a no-first use policy. Its doctrine promises 'massive retaliation' to any aggression.	ADDING an element of flexibility to unconditional no first use posture can help underpin deterrence, according to analysts.

Pokhran witnessed Atalji's firm resolve to make India a nuclear power and yet remain committed to the doctrine of 'no first use'. India has adhered to this. What happens in future depends on the circumstances.

RAJNATH SINGH, Defence minister



Source: Live Mint

1. **Changing Regional Dynamics:** India's nuclear doctrine is being tested by the rapidly changing security dynamics in its region. The modernization and expansion of China's nuclear capabilities pose a significant challenge to India's policy of minimum deterrence. This transformation in the nuclear landscape could potentially strain India's ability to respond effectively in a crisis.
2. **Pakistani Tactical Nuclear Weapons:** Pakistan's development of tactical nuclear weapons challenges India's NFU policy. The use of such weapons in a limited war scenario could potentially escalate the conflict, putting India in a difficult position given its NFU commitment.
3. **Debate over No First Use Policy:** The NFU policy's credibility has also been questioned. Doubts arise about whether India would stick to its NFU commitment if it had reliable information about an imminent nuclear strike. This ambiguity could potentially undermine the doctrine's deterrence value.
4. **Credibility of Deterrence:** India's commitment to a "Minimum Credible Deterrence" raises questions about whether it possesses enough nuclear weapons to effectively deter potential aggressors, particularly given China's rapid military modernisation and nuclear expansion.
5. **Lack of Counter-Force Strategy:** India's nuclear doctrine does not explicitly mention a counter-force strategy, focusing on enemy military assets. Critics argue that this could potentially limit India's strategic options in the event of a nuclear conflict.
6. **Vulnerability to First Strike:** The "No First Use" policy potentially exposes India to a damaging first strike from an adversary. Critics argue that in such a case, India's ability to launch a retaliatory strike could be significantly compromised.
7. **Credibility of Massive Retaliation:** India's declared policy of **massive retaliation** has been questioned on the ground that responding to a limited or tactical nuclear strike with a massive nuclear attack could appear disproportionate and potentially escalate the conflict into an all-out nuclear war.

What are the implications of shifting from the present nuclear doctrine?

1. **Elevated Regional Tensions:** If India were to abandon its “No First Use” policy, it could escalate tensions in the region, particularly with Pakistan and China, who might interpret such a move as a sign of increased aggression.
2. **Arms Race:** A shift in India’s nuclear doctrine could potentially trigger an arms race, with neighbouring countries feeling the need to expand their own nuclear arsenals in response to India’s perceived shift in stance.
3. **International Reputation:** India has traditionally been viewed as a responsible nuclear state, due in part to its “No First Use” policy and commitment to minimum credible deterrence. Altering this doctrine could tarnish that reputation and lead to international criticism.
4. **Destabilize the region:** The current doctrine contributes to strategic stability in the region by making it clear that India’s nuclear weapons are purely for deterrence and defensive purposes. A shift in this policy could destabilize the region by creating uncertainty around India’s intentions.
5. **Resource Allocation challenges:** A change in doctrine, particularly one leading to the expansion of India’s nuclear arsenal, would require substantial financial resources. This could divert funds from other critical areas like conventional military capabilities or economic development.

What should be the way forward for India’s nuclear doctrine?

1. **Maintain Strategic Restraint:** India should continue to adhere to its current nuclear doctrine of “No First Use” and “Credible Minimum Deterrence”. These policies have served India well by maintaining regional stability and preserving its international reputation as a responsible nuclear state.
2. **Strengthen Conventional Capabilities:** While maintaining a credible nuclear deterrent, India should also focus on strengthening its conventional military capabilities. This can help deter conventional conflicts that may escalate to the nuclear level.
3. **Promote Nuclear Disarmament:** India should continue advocating for global nuclear disarmament and non-proliferation. This includes supporting international treaties aimed at nuclear disarmament and urging other nuclear states to adopt “No First Use” policies.
4. **Enhance Crisis Management Mechanisms:** India should work with other regional actors to enhance crisis management mechanisms. This could include establishing hotlines, conducting joint military exercises, and agreeing on confidence-building measures to prevent accidental escalation during times of crisis.
5. **Invest in Missile Defense Systems:** To counter the growing threat from China’s modernizing nuclear arsenal, India should invest in developing and deploying advanced missile defense systems. This could offer an additional layer of protection against potential nuclear strikes.
6. **Strengthen second-strike capability:** India should strengthen its second-strike capability by ensuring that its nuclear forces remain survivable even after a first attack. This requires strengthening sea-based nuclear forces, secure communication systems, hardened infrastructure and dispersed assets.
7. **Strengthen nuclear diplomacy:** India should strengthen nuclear diplomacy by promoting strategic stability, nuclear risk reduction and confidence-building measures with China, Pakistan and other nuclear-armed states. It should participate actively in global forums, support universal and non-discriminatory nuclear disarmament, and advocate dialogue, transparency and crisis-communication mechanisms to reduce the risk of accidental or unintended nuclear escalation.

Conclusion: India’s nuclear doctrine should evolve through a balance of credible deterrence, strategic restraint and adaptability.

Sources: [The Hindu](#)

Syllabus: GS 2: International Relations – India's Nuclear Policy.

Right to Vote as Fundamental Right – Arguments in Favour & Against – Explained Pointwise



A recent newspaper investigation found that 97 eligible voters in Goa were excluded from electoral rolls after centralised ECINet software prevented Electoral Registration Officers (EROs) from reversing the decisions. The incident highlights concerns over electoral inclusion and has renewed the debate on whether the right to vote should be elevated to a Fundamental Right.

What is the constitutional and legal basis of the right to vote in India?

- The right to vote in India is primarily a **statutory right**, rather than a Fundamental Right.
- However, the right to vote in India has constitutional & statutory basis:

Constitutional Basis	○ Article 326 provides for elections to the Lok Sabha and State Legislative Assemblies on the basis of adult suffrage. ○ Every Indian citizen who is 18 years or above is entitled to be registered as a voter, subject to constitutionally permitted disqualifications.
Statutory Basis	○ The right to vote is regulated mainly by the Representation of the People Act, 1950 and the Representation of the People Act, 1951. ○ RPA 1951 (Section 62): Establishes the statutory right to vote in a specific constituency, provided the person's name appears on the electoral roll.

	○ RPA 1952 (Section 62(5)): Restricts individuals under confinement (prison, police custody) from voting, with an exception for those under preventive detention.
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- **Constitutional Assembly Debate:**

- Dr. **B.R. Ambedkar** and **K.T. Shah** initially argued for it to be a Fundamental Right. However, **Sardar Patel** and **C. Rajagopalachari** opposed this, fearing that the Princely States would refuse to join the Union if their electoral autonomy was immediately restricted.
- It was decided to place universal adult suffrage in **Article 326** (Part XV on Elections) instead. The logic was that the right was fundamental in importance, but it could be provided for outside the chapter on Fundamental Rights to accommodate the political realities of the time.

How has the judiciary interpreted the right to vote in India?

Jyoti Basu v/s Debi Ghosal Case (1982)	<u>Right to vote is not a Fundamental Right:</u> The Supreme Court held that the right to elect, the right to be elected and the right to dispute an election are statutory rights, and not Fundamental Rights. Therefore, the right to vote is subject to the conditions and limitations prescribed by law.
Kuldip Nayar v/s Union of India (2006)	SC reaffirmed that the right to vote is essentially a statutory right under Section 62 of the Representation of the People Act 1951, and not a fundamental or constitutional right.
Rajbala v/s State of Haryana (2015)	Described the right to vote as a constitutional right, however, the larger bench ruling in Kuldip Nayar case prevails.
PUCL v/s Union of India (2003)	<u>Right to Know (Article 19(1)(a)):</u> Supreme Court held that while casting a vote itself is a statutory right, a voter's "Right to Know" background details (assets, criminal antecedents, educational qualifications) about candidates is a Fundamental Right derived from freedom of speech and expression (Article 19(1)(a)).
PUCL v/s Union of India (2013)	<u>Right to Reject (NOTA):</u> Supreme Court recognized the right to cast a "None of the Above" (NOTA) vote as an integral aspect of free expression under Article 19(1)(a).

Although the right to vote is not a Fundamental Right, the judiciary has recognised its central role in a representative democracy, as it enables citizens to participate in the formation of government and influence public governance.

What is the status of the right to vote in other democracies?

South Africa	Constitution directly lists the right to vote as a Fundamental Right under the Bill of Rights.
Germany	The Basic Law explicitly establishes the right to vote as a fundamental right of the citizen .
Canada	Canadian Charter of Rights & Freedoms guarantees every Canadian citizen the right to vote.
France	The right to vote is a fundamental constitutional right tied directly to national sovereignty.
United Kingdom	The right to vote is a statutory right conferred by Parliament , primarily through the Representation of the People Act 1983 .
United States	The U.S. Constitution does not explicitly grant an affirmative, individual right to vote. Instead, the right is protected through prohibitions on discrimination by various amendments. However, the Supreme Court has recognized voting as a "fundamental right" under the Equal Protection Clause.

What are the arguments in favour of elevating the right to vote to the status of a Fundamental Right?

1. **Strengthening democratic participation:** Voting is the primary means through which citizens participate directly in representative democracy. Making it a Fundamental Right would accord greater constitutional protection to political participation.
2. **Reinforcing political equality:** Universal voting rights embody the principle of **"one person, one vote, one value."** Fundamental-right status could strengthen protection against arbitrary exclusion from the electoral process.
3. **Greater judicial protection:** Fundamental Rights are enforceable under **Articles 32 and 226**. Elevating the right to vote could provide citizens with a stronger constitutional remedy against unjustified restrictions.
4. **Protecting voter access:** It could strengthen constitutional scrutiny of measures that unnecessarily prevent eligible citizens from registering or voting, particularly where administrative failures are involved.
5. **Preventing arbitrary legislative restrictions:** As a statutory right, the right to vote is largely governed by ordinary legislation. Fundamental-right status could subject restrictions on voting to stricter constitutional scrutiny.
6. **Deepening constitutional democracy:** Elevating the right to vote to a Fundamental Right could deepen India's constitutional democracy by recognising political participation as an essential dimension of citizenship.
7. **Strengthening electoral accountability:** A constitutionally protected voting right could reinforce the role of citizens in holding governments and elected representatives accountable.

What are the arguments against elevating the right to vote to the status of a Fundamental Right?

1. **Need for legislative flexibility & regulatory control:** The right to vote involves detailed rules relating to voter registration, preparation of electoral rolls, disqualifications, eligibility and election procedures. Keeping it as a statutory right allows Parliament to modify these rules through ordinary legislation as electoral conditions and administrative requirements evolve. Elevating it to a Fundamental Right could subject such changes to greater constitutional scrutiny and potentially reduce the flexibility needed to regulate the electoral process effectively.
2. **Risk of Judicial Overreach:** Elevating the right to vote to a Fundamental Right could bring a wider range of electoral matters under direct constitutional scrutiny & would bring various electoral matters before courts. Excessive judicial intervention may reduce the flexibility of Parliament and the Election Commission of India in designing and administering detailed electoral rules.
3. **Existing judicial remedies:** Even without Fundamental Right status, citizens can challenge unlawful electoral actions through constitutional remedies, particularly under Articles 226 and 32 where an independent Fundamental Right is implicated.
4. **Slippery Slope:** Elevating the right to vote to a Fundamental Right could trigger demands to accord similar constitutional status to other political rights, such as the right to contest elections. This may broaden the scope of judicial scrutiny over electoral matters and create challenges in maintaining a balance between political participation, representative democracy and orderly electoral administration.

What should be the way forward?

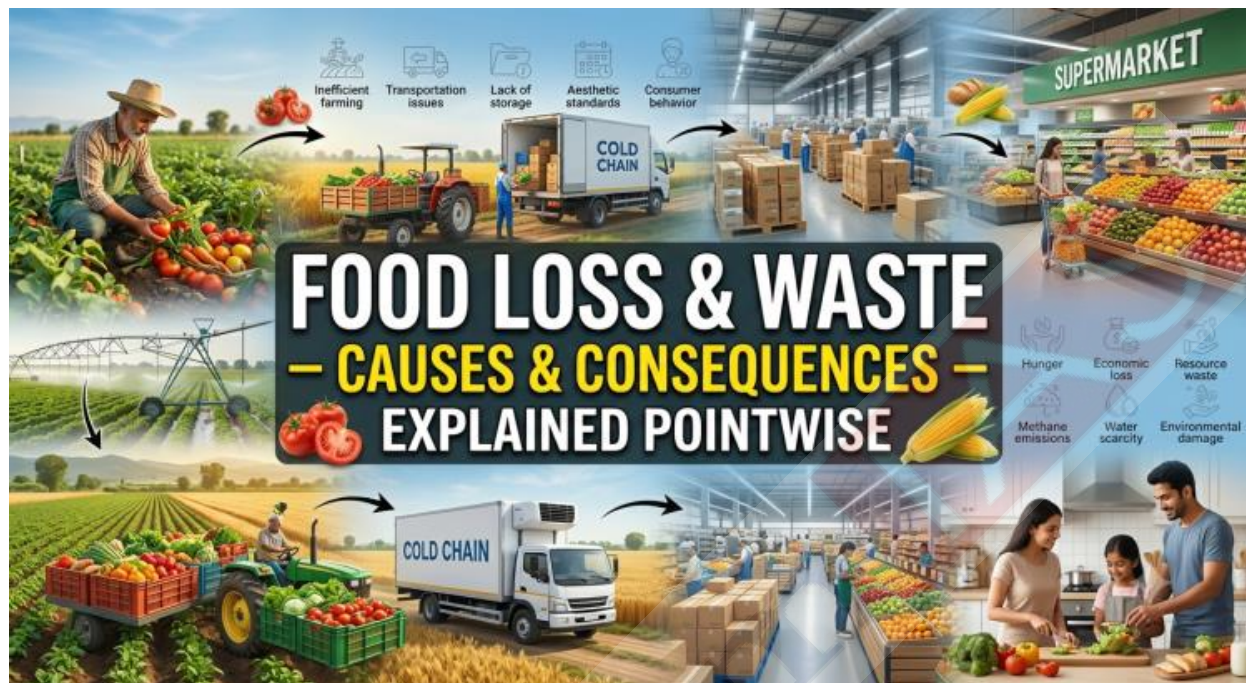
1. **Build consensus before constitutional change:** Any proposal to confer Fundamental Right status should follow wide parliamentary, constitutional and public consultation, examining its implications for electoral legislation and administration.
2. **Focus on substantive electoral participation:** Whether or not the legal status changes, the priority should be to ensure that every eligible citizen can register, access the ballot and exercise the choice freely and effectively.
3. **Strengthen voter access:** Ensure universal, accessible and hassle-free voter registration, particularly for migrants, persons with disabilities, the elderly and other vulnerable groups.
4. **Learn from comparative experience:** India can examine how other democracies constitutionally protect voting rights while retaining reasonable regulations concerning voter eligibility, electoral integrity and administration.
5. **Ensure stronger safeguards:** Robust safeguards should be established against wrongful deletion from electoral rolls, arbitrary disqualification and administrative errors. At the same time, voters should have access to timely notice, grievance-redressal mechanisms and effective judicial remedies to protect their electoral participation.

Conclusion: Rather than treating constitutional elevation as an end in itself, the reform debate should aim to create an electoral framework where the constitutional commitment to universal adult suffrage translates into meaningful and equal political participation.

UPSC GS-2: Indian Polity

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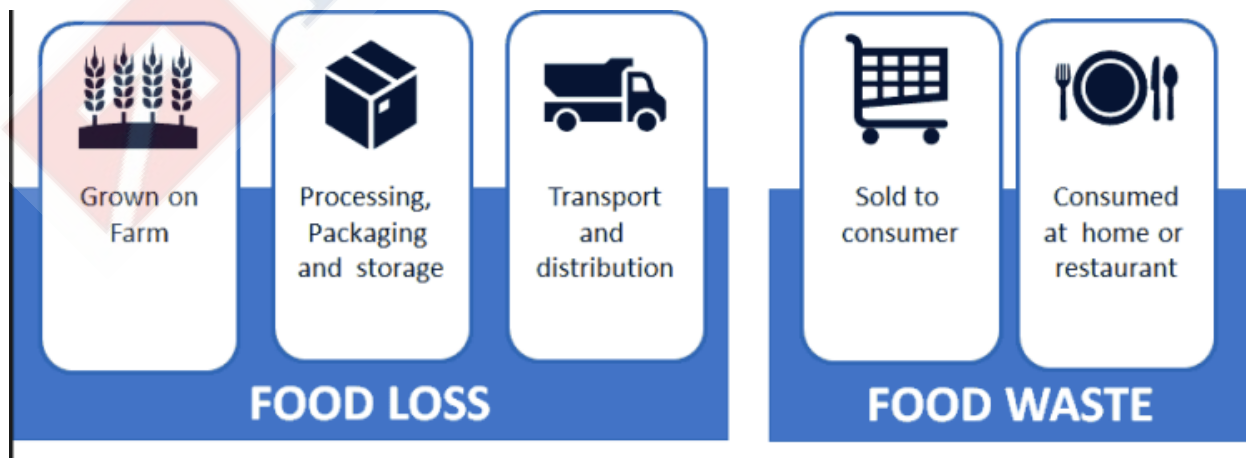
Food Loss & Waste – Causes & Consequences – Explained Pointwise



Observed annually on **29 September**, the **International Day of Awareness of Food Loss and Waste** highlights the need to reduce food lost along supply chains and food wasted at retail, food-service and household levels. Food loss & waste remain one of the world's most persistent challenges, with severe consequences for climate, food security, economic cost, and sustainable use of natural resources.

What is food loss and food waste?

- **Food loss** refers to the decrease in the quantity or quality of food before it reaches the consumer, mainly during production, harvesting, post-harvest handling, storage, processing and transportation.
- **Food waste** refers to food that is discarded or left uneaten at the retail, food-service and household levels, even though it was fit for human consumption.
- Food loss occurs mainly along the food supply chain before retail, while food waste occurs mainly at the retail, food-service and consumer levels.



Source: GDRC

What is the present status of food loss & waste in India & globally?

Globally	- Approximately one-third of all food produced for human consumption globally is lost or wasted. Food loss: FAO estimates that around 13.2% of food is lost globally between the post-harvest stage and before retail. The latest SDG monitoring estimates global losses at 13.3% in 2023, indicating little apparent progress since 2015. Food waste: According to UNEP's Food Waste Index Report 2024, around 1.05 billion tonnes of food was wasted in 2022 at the household, food-service and retail levels – about 19% of food available to consumers. Households are the largest source of this waste – 60% came from households, 28% from food services and 12% from retail. Per Capita Household Waste: The average person globally generates about 79 kg of household food waste annually.
India	- A NABCONS study commissioned by the Ministry of Food Processing Industries (MoFPI), covering 54 crops/commodities for 2020–22, estimated losses of: Cereals: 3.89-5.92% (~5%) Pulses: 5.65-6.74% (~6%) Fruits: 6.02-15.05% (~10%) Vegetables: 4.87-11.61% (~8%) Marine fisheries: 8.76% (~9%) Food Loss: Up to 40% of food produced in India is lost before reaching consumers. Almost 30-50% of perishable produce like fruits & vegetables spoil due to inadequate cold chain infrastructure. Per Capita Household Waste: The average Indian household generates about 50-55 kg of food waste per person per year, lower than the global average of 79 kg.

What are the major causes of food loss and waste in India?

- Inadequate storage infrastructure:** Inadequate and unevenly distributed warehouses, silos, cold-storage facilities and scientific storage systems contribute significantly to post-harvest food losses in India. Perishable commodities such as fruits, vegetables, dairy and fish are particularly vulnerable to spoilage when appropriate temperature and humidity-controlled storage is unavailable. This leads to quality deterioration, distress sales, lower farmer incomes and wastage of edible food.
- Weak cold-chain infrastructure:** India has gaps in integrated cold-chain infrastructure connecting farms, collection centres, storage facilities, refrigerated transport and markets. Inadequate pre-cooling, insufficient refrigerated transportation and uneven distribution of cold-storage facilities can increase post-harvest spoilage and quality deterioration, leading to economic losses for farmers and reduced availability of food.
- Poor post-harvest handling:** Inadequate harvesting, sorting, grading, packaging and handling practices can cause physical damage, bruising and contamination of food, accelerating spoilage. Small and fragmented farms often lack access to modern post-harvest technologies, leading to significant losses.
- Inefficient transportation:** Inadequate transport infrastructure, long transit times, poor road connectivity and insufficient refrigerated vehicles can expose perishable food to heat, moisture and

physical damage. This is particularly significant for fruits, vegetables, dairy, meat and fish, leading to spoilage before they reach markets and consumers.

5. **Fragmented Supply Chains & Middlemen:** Agricultural produce typically passes through multiple intermediaries (local traders, commission agents, regional mandis, and wholesalers) before reaching retail. Each transfer point delays delivery and increases the risk of spillage and spoilage.
6. **Market fluctuations:** Sudden changes in demand, prices and supply can make it uneconomical for farmers to harvest and transport perishable produce. During periods of **market glut**, excess supply of fruits and vegetables may cause prices to fall below the cost of harvesting, leading farmers to leave produce unharvested or allow it to perish.
7. **Low Processing Rates:** India processes less than 10% of its total agricultural output (compared to 60–80% in developed countries). Without sufficient agro-processing facilities to convert excess harvest into longer-lasting preserved items, surplus fresh produce is left to rot.
8. **Excess food in restaurants and events:** Large portions, over-preparation due to uncertain demand and elaborate buffets often result in substantial quantities of edible food being discarded. Weddings, festivals and other large gatherings can further increase food waste due to over-ordering, low consumption and inadequate systems for redistributing surplus food.
9. **Changing Urban Consumption Habits:** Growing urban middle-class populations, increased reliance on food delivery apps, impulse bulk-buying at modern supermarkets, and poor meal planning lead to cooked food spoiling in domestic refrigerators.
10. **Lack of awareness and segregation:** Limited awareness about proper food storage, portion planning, expiry dates and food redistribution often leads to avoidable food waste. Further, inadequate segregation of food waste from other municipal waste makes recovery, composting and processing difficult, resulting in more food being sent to landfills.

What are the consequences of food loss & waste in India?

1. **Threat to food security:** Food loss and waste reduce the effective availability of food despite significant agricultural production. Losses during harvesting, storage and transportation, along with waste at the consumer level, reduce the food available for consumption and can undermine efforts to ensure adequate, affordable and nutritious food, particularly for vulnerable populations.
2. **Economic losses for farmers:** Food loss directly reduces the marketable surplus and income of farmers, as farmers bear the cost of producing, harvesting and transporting food that ultimately gets damaged or spoiled. The NABCONS study (2020–22) estimated post-harvest losses worth ₹26,001 crore in cereals, ₹29,545 crore in fruits and ₹27,459 crore in vegetables in India.
3. **Food Inflation:** Systemic supply losses reduce the net availability of produce in wholesale mandis. This artificial scarcity drives up retail prices, triggering seasonal spikes in food inflation that disproportionately affect lower- and middle-income consumers.
4. **Wasted Freshwater:** Agriculture accounts for about 80-90% of India's freshwater use. Food that is never consumed represents roughly **230-250 cubic kilometers of water wasted** annually which is equivalent to the annual water consumption of major urban centers.
5. **Greenhouse Gas Emissions & Climate Change:** Decomposing organic waste in open municipal landfills releases **methane**, a potent greenhouse gas that is 28 times more effective at trapping atmospheric heat than carbon dioxide over a 100-year timescale. Food waste accounts for 8-10% of global greenhouse gas emissions.
6. **Nutritional losses:** Food loss and waste lead to the loss of calories, proteins, vitamins and minerals that could otherwise contribute to improving India's nutritional security. This is particularly significant because India continues to face substantial malnutrition: **NFHS-5 (2019–21) recorded**

stunting among 35.5%, wasting among 19.3% and underweight among 32.1% of children under five.

7. **Increased fiscal and infrastructure burden:** Food loss and waste result in significant economic losses while also reducing the efficiency of investments made in agricultural and food infrastructure. The NABCONS study estimated that around 68.9 million tonnes of agricultural produce was lost in 2020-21, with an associated monetary loss of about **₹92,000 crore to ₹1.5 lakh crore** – This represents nearly 1% of India's GDP and a significant portion of its agricultural gross value added.
8. **Impedes sustainable development:** Food loss and waste undermine India's progress towards **SDG 2** (Zero Hunger), **SDG 12** (Responsible Consumption and Production) and **SDG 13** (Climate Action).

What measures have been taken by the government to reduce food loss and waste in India?

1. **Pradhan Mantri Kisan SAMPADA Yojana (PMKSY):** It aims to create modern food-processing infrastructure and efficient supply chains from the farm gate to the retail outlet, thereby reducing wastage. Its components include Integrated Cold Chain, food-processing capacities, agro-processing clusters and Operation Greens.
2. **PM-FME (PM Formalisation of Micro food processing Enterprises Scheme):** Financial and technical support targeted at small-scale and unorganized food processing micro-units to reduce local produce spoilage.
3. **Integrated Cold Chain and Value Addition Infrastructure:** Supports pre-cooling, sorting, grading, packing, cold storage, refrigerated vehicles and processing facilities to prevent deterioration of perishables during transportation and storage.
4. **Operation Greens:** Supports the development of integrated value chains for perishable agricultural commodities, including better storage, transportation, processing and market linkages, helping reduce post-harvest losses and distress sales.
5. **Mission for Integrated Development of Horticulture (MIDH):** Provides financial assistance for establishing and modernising cold-storage facilities for horticultural produce, thereby reducing post-harvest losses.
6. **Agriculture Infrastructure Fund (AIF):** Promotes investment in post-harvest infrastructure such as warehouses, cold chains, logistics and processing facilities, improving farmers' ability to store and market produce.
7. **Modernisation of foodgrain storage:** The government is strengthening FCI and other storage infrastructure. In 2026, the Smart Warehousing System, using AI and IoT-based technologies, was launched to modernise foodgrain warehousing and improve monitoring and management.
8. **FSSAI's "Save Food, Share Food, Share Joy" Initiative:** Launched by the Food Safety and Standards Authority of India (FSSAI), this initiative created the Indian Food Sharing Alliance (IFSA). It connects food businesses, caterers, and hotels with registered food recovery agencies and NGOs to safely distribute surplus edible food to needy populations.
9. **Food Safety Regulations for Surplus Food (2019):** FSSAI enacted formal regulations (Recovery and Distribution of Surplus Food) establishing hygiene standards for donating surplus food, reassuring businesses that safe donations will not face civil liability.

What should be the way forward for efficient food management?

1. **Strengthen post-harvest infrastructure:** India should expand scientific warehouses, modern silos, cold-storage facilities, pack houses and ripening chambers, particularly near production centres. Decentralised infrastructure can reduce spoilage during storage and transportation, extend the shelf life of perishables and improve farmers' ability to store produce and avoid distress sales.

2. **Develop integrated cold chains:** India should develop end-to-end cold-chain networks connecting farm-gate collection centres, pack houses, refrigerated transportation, cold storage, processing units and retail markets.
3. **Promote food processing and value addition:** Expanding food processing and value addition can reduce post-harvest losses by converting perishable and surplus agricultural produce into products with longer shelf lives.
4. **Improve supply-chain efficiency:** Strengthening farm-to-market linkages through Farmer Producer Organisations (FPOs), digital agricultural markets, better rural roads and efficient logistics can reduce delays, repeated handling and transit losses. Greater integration of storage, cold chains, processing and retail can ensure faster movement of perishable produce and minimise food loss.
5. **Adopt modern technologies:** Modern technologies such as IoT sensors, AI, blockchain and data analytics can enable real-time monitoring of temperature, humidity, storage conditions and inventory levels. AI-based demand forecasting can also reduce overproduction and unsold stocks, while digital traceability can help identify bottlenecks and spoilage across the food supply chain.
6. **Reduce consumer-level food waste:** Consumer-level food waste can be reduced by promoting responsible consumption, better meal and portion planning, proper food storage and awareness about date labels. Households, hotels, restaurants and institutions should adopt demand-based food preparation.
7. **Facilitate redistribution of surplus food:** Establishing stronger mechanisms to collect, safely store and redistribute edible surplus food from households, restaurants, hotels, retailers and large events to food banks, NGOs and vulnerable communities can prevent avoidable waste. Standardised food-safety protocols and better coordination among FSSAI, local bodies, food businesses and civil-society organisations can make such redistribution more effective.
8. **Promote circular food systems:** India should adopt a circular approach to food management by ensuring that food and its by-products remain within the resource cycle for as long as possible. Food unsuitable for human consumption can be diverted towards animal feed, composting, biogas and bioenergy, while agricultural residues can be converted into useful products. This can reduce landfill waste, recover resources and promote a more sustainable and resource-efficient food system.

Conclusion: Reducing food loss and waste is not merely a matter of preventing wastage but of improving the efficiency and sustainability of India's entire food system.

UPSC GS-3: Indian Agriculture
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AFSPA – Significance & Concerns – Explained Pointwise

The Ministry of Home Affairs (MHA) has recently extended the Armed Forces (Special Powers) Act (AFSPA), 1958, for another six months from 1 October 2026 in specified areas of **Manipur, Nagaland and Arunachal Pradesh**, following a review of the security situation.

What is the Armed Forces (Special Powers) Act (AFSPA)?

- AFSPA is a central law that gives special powers to the armed forces in areas officially declared as “**disturbed**” to help them tackle insurgency and serious internal security threats.
- The primary objective of AFSPA is to provide the armed forces (including the Army, Air Force, and paramilitary forces) with special legal immunity and powers necessary to control internal conflict,

militancy, and insurgency in regions where the civil administration and police are deemed incapable of maintaining law and order.

- AFSPA was first promulgated in **1942**, by **Linlithgow**, in response to the **Quit India Movement** in 1942. Its aim was “to confer special powers upon certain officers of the armed forces.
- After Independence, the Act was retained by the ordinance enacted in **1958**, to control increasing violence in the North-eastern States, which the State governments found difficult to control.
- In simple terms, AFSPA gives armed forces the power to maintain public order in “disturbed areas”.

Present Status of AFSPA:

Manipur	In force across the State except areas under 13 police stations in 5 districts.
Nagaland	In force in 9 districts (Dimapur, Niuland, Chümoukedima, Mon, Kiphire, Noklak, Phek, Peren and Meluri) and specified areas under 21 police stations in 5 other districts.
Arunachal Pradesh	In force in Tirap, Changlang and Longding districts , and specified areas under Namsai, Mahadevpur and Chowkham police stations in Namsai district.
Assam	AFSPA previously covered the entire state. It is now maintained only in 3 border districts (Tinsukia, Charaideo, and Sivasagar) due to localized activities of insurgent groups like ULFA.
Jammu & Kashmir	AFSPA is also applicable under a separate J&K Armed Forces (Special Powers) Act, 1990.
Tripura	Withdrawn in 2015.
Meghalaya	Withdrawn in 2018.

What are its key provisions?

1. Declaration of “disturbed area” (Section 3):

- The Governor of a state, the Administrator of a Union Territory, or the Central Government can declare any area “disturbed” if the situation requires deployment of the armed forces to aid civil power.
- Once so notified, the special powers under AFSPA apply in that area.

2. Special powers of the armed forces (Section 4): In a notified disturbed area, any commissioned, warrant, non-commissioned officer or equivalent rank can:

- Use force, even to the extent of causing death, after giving due warning, against persons:
 - acting in contravention of law prohibiting assembly of five or more persons, or
 - carrying weapons or things capable of being used as weapons or explosives.

- Destroy arms dumps, fortified positions, shelters or training camps from which armed attacks are made or likely to be made.
 - Arrest without warrant anyone who has committed, is suspected of having committed, or is about to commit a cognisable offence, using necessary force.
 - Enter and search any premises without warrant to make such arrests or recover arms, ammunition, or explosives.
3. **Duties after arrest (Section 5):** Any person arrested and any seized property must be handed over to the nearest police station “with the least possible delay,” so that normal criminal procedure can then follow.
 4. **Legal protection/immunity (Section 6):** No prosecution, suit or other legal proceeding can be instituted against any person acting under AFSPA, except with the prior sanction of the Central Government. This clause is intended to protect personnel acting in good faith during operations, but is also the main focus of human-rights criticism.

What is the significance of AFSPA in maintaining internal security in India?

1. **Enables deployment in high-risk “disturbed areas”:** AFSPA allows the Centre or Governor to declare an area “disturbed,” enabling the armed forces to aid civil authorities where police and local administration cannot control violence or insurgency.
2. **Provides operational flexibility to forces:** Powers to use force after warning, arrest without warrant, and conduct searches and seizures allow the army/paramilitary to react quickly and pre-empt threats such as ambushes, armed mobs, or militant movements.
3. **Strengthens state capacity in conflict zones:** In border and remote regions with difficult terrain and weak policing, AFSPA is seen as necessary to secure roads, infrastructure, elections, and civilian life against insurgent or terrorist groups.
4. **Legal protection for personnel:** Requirement of prior central sanction for prosecution under AFSPA is argued to protect soldiers from vexatious litigation and allow them to act decisively in life-threatening situations.
5. **National security and territorial integrity:** The Act is justified by governments as essential to preserve sovereignty and integrity in regions facing secessionist, insurgent or cross-border militant movements.

What are the major concerns and criticisms associated with the implementation of AFSPA?

1. **Human rights violations:** Wide powers to shoot, arrest without warrant, and search are seen as enabling extrajudicial killings, torture, enforced disappearances, rape, and harassment of civilians in states like Manipur, Nagaland, J&K and others. Human rights groups, UN experts and civil society describe AFSPA as “draconian” and incompatible with international human-rights norms.
2. **Legal immunity and lack of accountability:** Section 6 requires prior central government sanction before prosecuting armed forces personnel, which is rarely granted, leading to near-impunity even in serious abuse cases. This undermines rule of law and victims’ access to justice, and is seen as violating fundamental rights under Articles 14 and 21.
3. **Violation of fundamental rights and militarisation:** Critics say AFSPA effectively suspends normal constitutional protections in “disturbed areas,” normalising prolonged militarisation and eroding civil liberties such as the right to life, liberty, movement and expression. Long-term deployment of the army for internal policing is argued to blur civil-military boundaries and weaken civilian institutions.
4. **Misuse, excess force and distrust:** Supreme Court judgments have noted that any use of excessive or retaliatory force is illegal even under AFSPA, but multiple inquiries have documented fake encounters

and misuse, deepening local resentment and distrust of the state. Critics argue that such practices fuel alienation and may actually worsen insurgency instead of resolving it.

5. Committee recommendations for repeal/reform:

- Jeevan Reddy Committee and the Second Administrative Reforms Commission both recommended repeal of AFSPA, with key provisions to be shifted into a more rights-compliant law like the Unlawful Activities (Prevention) Act.
- Other bodies, like the Santosh Hegde Commission and Justice Verma Committee, have called for strong review, tighter oversight and removal of blanket immunity.

What are the major recommendations of various committees and commissions, along with key Supreme Court judgments, concerning AFSPA?

Supreme Court Judgements on AFSPA	● Naga People's Movement of Human Rights v. Union of India (1998): The Supreme Court upheld the constitutional validity of AFSPA. However, it laid down guidelines and safeguards for the exercise of powers under the Act. It held that the armed forces must act within the framework of law and that the declaration of a "disturbed area" is subject to periodic review. ● Extra Judicial Execution Victim Families Association (EEVFAM) v. Union of India (2016): The Supreme Court ruled that every encounter death must be investigated by the state police, regardless of AFSPA. It held that excessive or retaliatory force is unlawful, even in disturbed areas, and consolidated prior jurisprudence on AFSPA's limits.
Recommendations of Various Committees and Commissions on AFSPA	● Justice B.P. Jeevan Reddy Committee (2004): ○ Repeal AFSPA entirely. ○ Incorporate appropriate provisions to Unlawful Activities (Prevention) Act (UAPA). ○ Set up district grievance cells. ○ Limit army deployment to 6 months with parliamentary review. ● Second Administrative Reforms Commission (2nd ARC) (2007): ○ Recommended replacing AFSPA by incorporating its essential and operational provisions into the UAPA to avoid parallel legal frameworks. ○ Replace it with humane legislation balancing security and rights. ● Justice Santosh Hegde Committee (2013): ○ AFSPA must be reviewed every 6 months to assess whether its continuation is genuinely necessary. ○ Security forces should not enjoy blanket immunity under Section 6. Criminal investigations must proceed if excessive force or illegal acts are committed. ○ Called it a "symbol of oppression." ● Justice J.S. Verma Committee (2013): ○ Review AFSPA urgently, especially for sexual offences by armed forces. ○ Try such cases under ordinary criminal law, not military courts. ● National Human Rights Commission (NHRC):

	○ Restrict AFSPA usage strictly as a temporary measure rather than an indefinite governance tool. ○ Strictly enforce mandatory procedures following arrests or encounters, including mandatory FIR registration, independent magisterial inquiries, and immediate reporting to the NHRC.
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What should be the way forward regarding the continued application of AFSPA?

1. Phased Withdrawal and Review:

- Withdraw AFSPA from areas where normalcy has returned (e.g. parts of J&K, Northeast) after security assessments, as done in Tripura (2015) and Meghalaya (2018).
- Mandate periodic 6-month reviews by Parliament or an independent body, with automatic sunset clauses for notifications.

Approach	Pros	Cons
Full repeal	Ends impunity, restores rights	May weaken counter-insurgency in active conflict zones.
Targeted Reform	Balances security & rights.	Requires political will, implementation capacity.
Phased Withdrawal	Builds trust, tests normalcy.	Risk of resurgence if premature.

2. Reforms to Existing Law:

- Amend Section 6 to make prior sanction faster and more transparent (e.g. time-bound decisions, judicial oversight), and allow prosecution for grave human rights violations without sanction.
- Strengthen Section 5 to ensure arrested persons are handed to police within 24 hours, with mandatory video recording of operations.
- Incorporate Supreme Court guidelines: mandatory FIRs and investigations for all deaths in encounters, independent magisterial inquiries.

3. Institutional Strengthening:

- Create a National Human Rights Commission (NHRC)-monitored oversight mechanism for AFSPA operations, with local grievance cells as recommended by the Jeevan Reddy Committee.
- Enhance training for armed forces on human rights, minimal force, and distinction between combatants and civilians.

4. Long-term Alternatives:

- Shift non-combat powers (arrest, search) to police and paramilitary under UAPA or CrPC, reserving army for active combat only.
- Invest in development, policing capacity, and peace-building in disturbed areas to reduce need for military deployment.

5. **Addressing Root Causes:** AFSPA is a tool to control symptoms, not resolve conflict. Sustainable stability requires political negotiation, political integration, socio-economic development, and resolving identity/ethnic disputes through dialogue.

Conclusion: AFSPA should be viewed as an exceptional security measure rather than a permanent governance mechanism. By strengthening local civil law enforcement, enforcing strict accountability for operational excesses, implementing judicial and commission recommendations, and prioritizing political dialogue, India can transition away from extraordinary martial powers toward normalized civil governance.

UPSC GS-3: Internal Security

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