



Monthly Editorial Consolidation



01st February to 28th February 2025

Drishti, 641, First Floor, Dr. Mukharjee Nagar, Delhi-110009
Inquiry: 87501-87501
Email: care@groupdrishti.in

Content

Ethanol Blending for Sustainable India	3
Enhancing Agricultural Productivity and Sustainability	8
Boosting India's Shipbuilding Industry	13
Unlocking India's MSME Potential	16
Reducing Industrial Emissions in India	22
Bridging the Gap in Tribal Welfare	27
India's Middle East Strategy	32
Harnessing AI for Governance	36
India to Become a Fintech Powerhouse	41
Reimagining Governor's Role in Indian Democracy	46
Strengthening Indo-French Ties	49
Growing Menace of Forest Fires in India	53
Building a Secure and Prosperous Indian Ocean Region	59
Strengthening Indo-US Strategic Partnership	64
Reforming India's Disaster Strategy	68
Make in India, Make for the World	73
President's Rule and Federalism in India	76
Future Cities Planning for Resilience and Inclusivity	80
India's Soil Health Crisis	83
Restoring the Spirit of RTI	89
Strengthening India-EU Partnership	93
Enhancing PwD Inclusion in India	97
Revamping Indian Railways	101

Ethanol Blending for Sustainable India

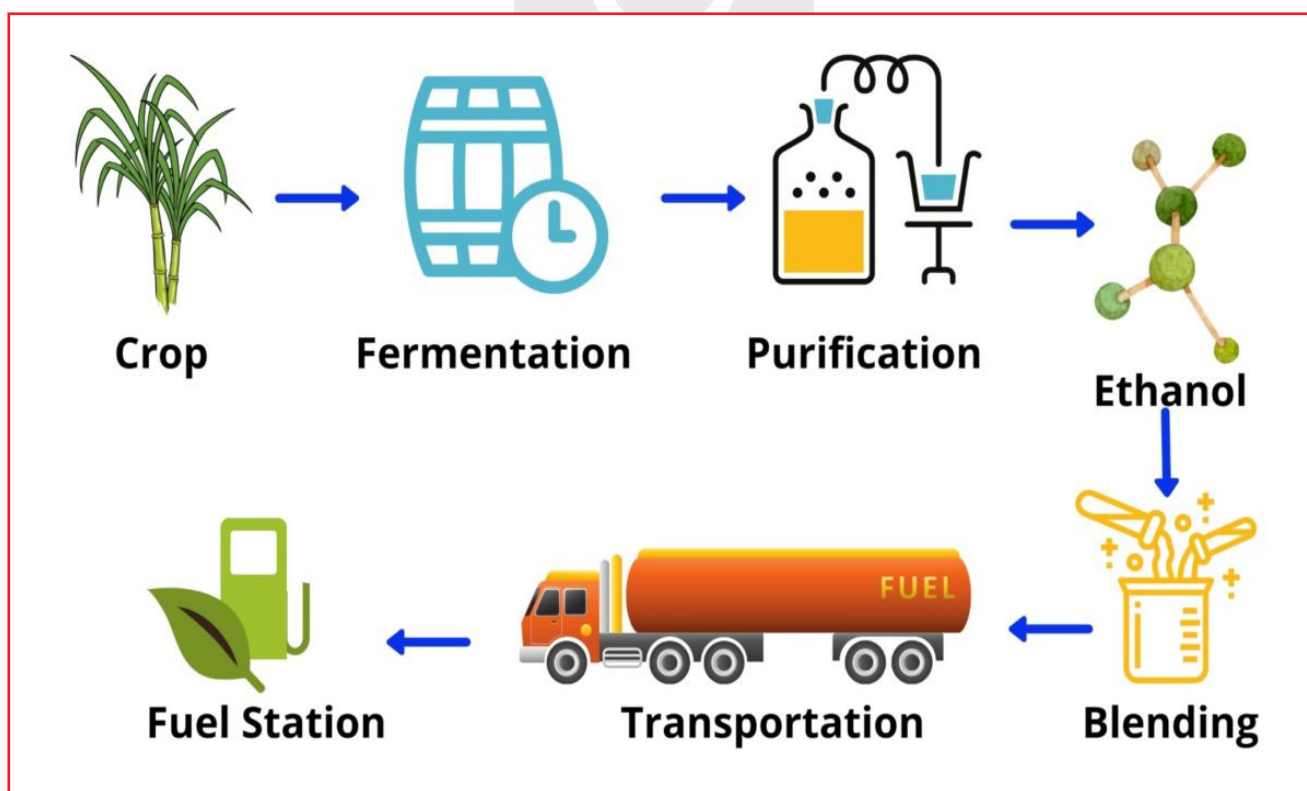
This editorial is based on “**Blending dilemma: Conflicting priorities on flex-fuel need clear policy**” which was published in Business Standard on 21/01/2025. The article brings into picture India’s ethanol-blending programme as a crucial step towards sustainability, enhancing energy security and reducing carbon emissions. However, challenges like feedstock shortages, water-intensive production, and supply chain inefficiencies must be tackled through policy support and innovation.

Tag: GS Paper - 3, Environmental Pollution & Degradation, Renewable Energy, 2nd ARC

India’s ethanol-blending programme is a major step towards sustainability, reducing fossil fuel dependence and curbing carbon emissions. It has enhanced energy security, saved ₹1.1 trillion in **foreign exchange**, and prevented 50 million tonnes of CO₂ emissions. However, challenges persist, including **feedstock shortages**, **water-intensive ethanol production**, **supply chain inefficiencies**, and pricing concerns. Addressing these issues through policy support, infrastructure expansion, and technological innovation is crucial for accelerating progress in this regard.

What is Ethanol Blending?

- **About: Ethanol blending** refers to the process of mixing ethanol, a biofuel derived from plant-based sources, with petrol to create a more sustainable and cleaner-burning fuel.
 - This reduces dependence on fossil fuels, lowers carbon emissions, and enhances energy security.
 - Ethanol is primarily produced from **sugarcane molasses, maize, rice, and other biomass sources** in India.
 - The Government of India launched the **Ethanol Blended Petrol (EBP) Programme** in **2003** to promote ethanol use in transportation fuel.



Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



➤ **Government Initiatives for Ethanol Blending:**

- **PM-JI-VAN Yojana** – Supports second-generation ethanol production from agricultural waste.
- **National Bio-Energy Programme** – Promotes ethanol and other biofuels for sustainable energy.
- **Interest Subvention Scheme** – Provides financial support for setting up ethanol plants.
- **GST Reduction** – Ethanol for EBP programme taxed at 5% (reduced from 18%) to encourage adoption.

➤ **Current Status & Future Roadmap:** The initial target of **10% blending by 2022** was achieved ahead of schedule, leading to an ambitious goal of **20% ethanol blending (E20) by 2025**.

- Currently, ethanol blending stands at **15% as of 2024**. Expansion of **ethanol-dedicated fuel stations** and **E20-compatible vehicles** will play a key role in accelerating implementation.

What are the Key Benefits of Ethanol Blending for India?

➤ **Energy Security and Reduced Import Dependence:**

- India imports over **87% of its crude oil needs**, making it vulnerable to price volatility and geopolitical risks.
- **Ethanol blending reduces this dependence** by substituting imported petrol with domestically produced **biofuel**, enhancing self-reliance in energy.
- The **Ethanol Blended Petrol (EBP) Programme** has already **saved ₹1.1 trillion in foreign exchange** over the last decade.
 - Additionally, ethanol blending helped replace **181 lakh metric tonnes of crude oil** between **2014 and 2024**.

➤ **Reduction in Carbon Emissions and Pollution:**

- Vehicular emissions** are a major contributor to **urban air pollution and climate change**, increasing respiratory diseases and environmental degradation.
- Ethanol has **oxygen molecules** that enable more complete combustion, reducing carbon monoxide and particulate matter emissions.
- The **National Bio-Energy Mission** promotes ethanol as a cleaner alternative to fossil fuels, aligning with India's **Net-Zero 2070** target.
 - Since 2014, the ethanol program has **cut CO₂ emissions by 544 lakh metric tonnes**, significantly improving air quality.

➤ **Economic Growth and Rural Employment:** Ethanol production boosts the rural economy by providing farmers with additional income streams through **sugarcane, maize, and other biofuel crops**.

- Increased ethanol demand encourages investment in distilleries and agro-processing industries, creating jobs and reducing distress migration.
- The **PM-JI-VAN Yojana** incentivizes second-generation ethanol production, further strengthening the rural economy.
- Ethanol blending has led to **₹87,558 crore disbursed to farmers** and **₹1,45,930 crore paid to distillers**, stimulating rural employment and agro-industrial growth.

➤ **Diversification of Cropping Patterns and Waste Utilization:** Ethanol production encourages a shift from **water-intensive crops like rice and wheat** to alternative feedstocks like maize and sorghum, promoting sustainable agriculture.

- The government has allowed **Food Corporation of India (FCI) rice and maize** for ethanol production, ensuring stable farmer incomes.
- The **price of ethanol from maize is ₹51.55/litre**, and from FCI rice, it is **₹56.87/litre**, making surplus grain utilization economically feasible.
 - The **interest subvention scheme** has attracted investment in **grain-based distilleries**, boosting ethanol supply.

➤ **Foreign Investment and Industrial Growth:** India's ethanol push has created a lucrative market for private investment in biofuel infrastructure, attracting both domestic and foreign capital.

- Policies like the **Long-Term Ethanol Procurement Policy** provide revenue visibility, encouraging large-scale investment in distilleries and supply chains.
- The **Global Biofuels Alliance (GBA)** launched at the **G20 Summit 2023** positions India as a global leader in ethanol trade and technology.
- The ethanol industry's rapid expansion has seen **₹40,000 crore in new investments**, enhancing India's manufacturing and export potential.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



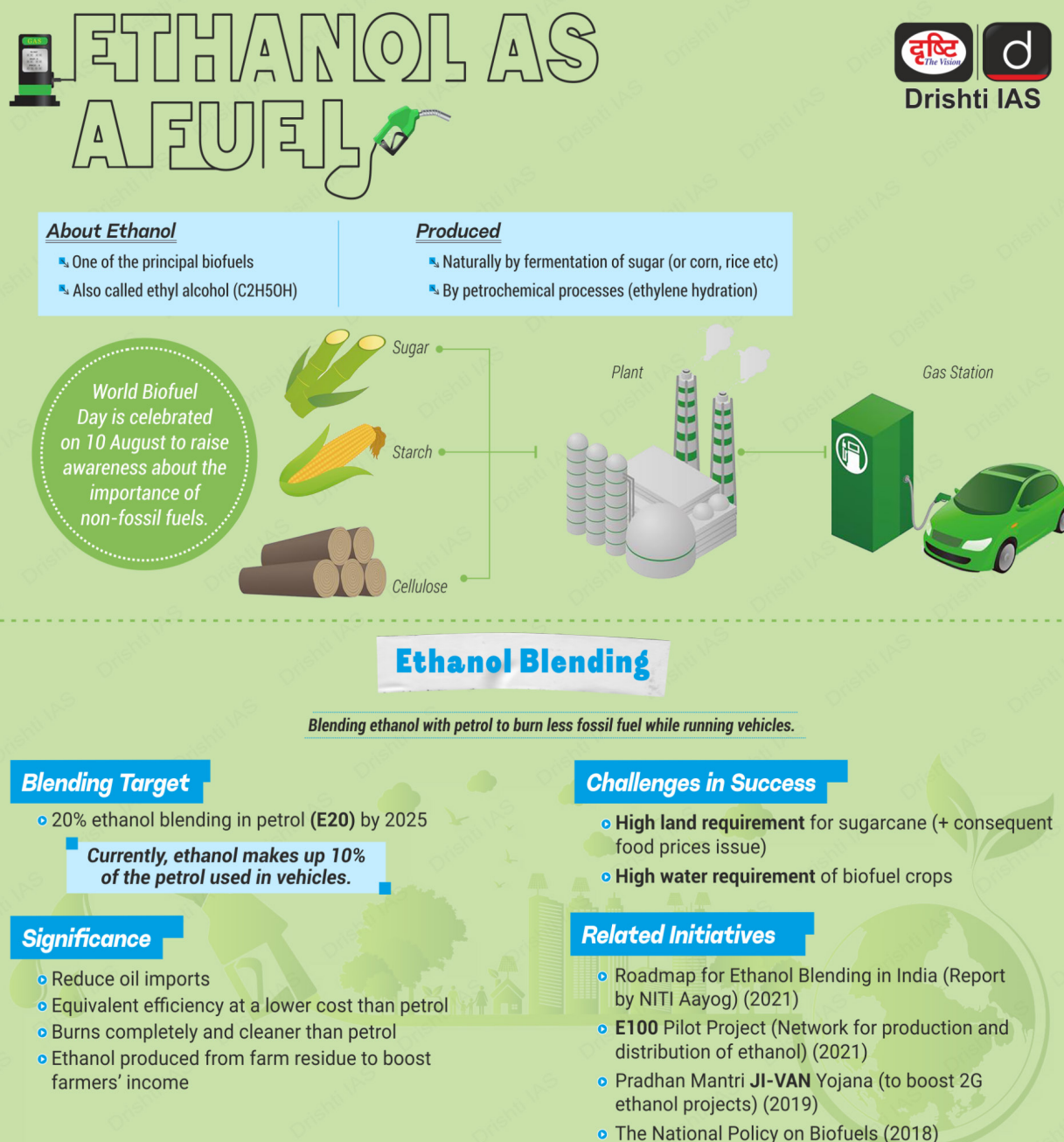
IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Strengthening of Automobile and Fuel Infrastructure:** Higher ethanol blending requires advancements in vehicle technology and fuel distribution networks, fostering innovation in India's auto sector.
- Automakers are developing **E20-compliant engines**, ensuring efficiency and durability in ethanol-petrol blends.
 - As of April, 2024, **E20 petrol is available at 13,569 PSU outlets**. This marks a significant step towards expanding ethanol blending across India.
 - This transformation supports the **National Green Mobility Strategy**, integrating ethanol with EVs and hydrogen fuel for a multi-fuel future.



Prepare with Drishti IAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



What are the Key Issues Associated with Ethanol Blending in India?

➤ **Water-Intensive Nature of Ethanol Production:** Ethanol production in India is **heavily dependent on sugarcane**, which requires enormous water resources, exacerbating water stress in already drought-prone regions.

- This raises concerns about unsustainable agricultural practices and groundwater depletion, particularly in states like **Maharashtra and Uttar Pradesh**.
- Alternative **feedstocks like maize and sorghum** are being promoted, but their adoption remains limited due to lower ethanol yields and farmer preferences.
- According to **NITI Aayog**, sugarcane and paddy combined use 70% of irrigation water of the country, posing risks for long-term sustainability of ethanol.

➤ **Impact on Food Security and Inflation:** As ethanol demand increases, more food grains like **rice and maize** are diverted for fuel, potentially driving up food prices and affecting food security.

- The use of **FCI rice and maize** for ethanol production may **reduce surplus buffer stocks**, limiting government capacity to stabilize food prices during shortages.
 - This raises ethical concerns about using edible grains for energy when malnutrition remains a challenge in India.
- **FAO 2023 report** warned that **biofuel expansion could tighten global food supply chains**, impacting vulnerable populations.

➤ **Limited Ethanol Production Capacity and Supply Chain Bottlenecks:** Despite rapid growth, India's ethanol production and distribution infrastructure remain inadequate to meet the **20% blending target by 2025**.

- Supply chain inefficiencies, including transport challenges and storage constraints, make uniform ethanol availability difficult across all regions.
- **Many states lack sufficient distilleries and blending facilities**, making them dependent on ethanol imports from other states.

➤ **Technological and Vehicle Compatibility Challenges:** India's vehicle fleet is largely designed for **E10 fuel**, and transitioning to **E20 and beyond** requires modifications in engine design and fuel systems.

- Higher ethanol content can cause **corrosion and reduced fuel efficiency**, leading to long-term maintenance challenges for consumers.

- Automobile manufacturers are working on **E20-compatible engines**, but existing vehicles may face performance issues unless retrofitted.

➤ **Financial Viability and Price Volatility:** Ethanol production is subject to **price fluctuations** due to variable sugarcane and grain output, **impacting industry profitability and investment stability**.

- Distilleries depend on government-fixed procurement prices, which may not always align with market dynamics, creating uncertainty for investors.
- The **energy content of ethanol is lower than that of gasoline**, requiring more fuel for the same mileage, which can offset cost benefits for consumers.

➤ **Environmental Concerns in Ethanol Production:** While ethanol reduces carbon emissions in vehicles, its production process—**especially from sugarcane and molasses**—leads to **high water usage, deforestation, and industrial waste discharge**.

- Ethanol distilleries generate large amounts of waste water. This wastewater, known as **vinasse**, contains high concentrations of organic matter, residual sugars, and other pollutants.
 - If not properly treated, **it can pose significant environmental risks**, including water pollution and depletion of oxygen in aquatic ecosystems.

➤ **Heavy Dependence on Government Subsidies:** Ethanol production in India is **heavily reliant on government incentives**, including **interest subvention schemes, differential pricing, and tax exemptions**.

- Any policy reversal or reduction in financial support could make **ethanol production economically unviable** for distillers and farmers.
- The **Pradhan Mantri JI-VAN Yojana** has been extended until 2028-29 to boost second-generation ethanol, but adoption remains slow due to **high capital costs**.
- Policy fluctuations in ethanol blending targets, **such as the shift from 2030 to 2025**, create implementation challenges for industry stakeholders.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



What Measures to Strengthen Ethanol Blending and Accelerate Implementation?

- **Expanding Feedstock Diversification Beyond Sugarcane:** Dependence on sugarcane for ethanol is unsustainable; India must promote **maize, sorghum, bamboo, and agricultural waste** as alternative feedstocks.
 - Strengthening the **Pradhan Mantri JI-VAN Yojana** with better R&D funding can accelerate second-generation ethanol production.
 - The government should also integrate **PM-KISAN** to provide financial incentives for farmers shifting to biofuel crops.
 - Expanding ethanol production from **damaged food grains and municipal waste** can further enhance availability.
 - A structured **minimum support price (MSP) framework** for ethanol-linked crops can ensure stable raw material supply.
- **Strengthening Rural Distilleries and Decentralized Production:** A decentralized ethanol production model with **small-scale distilleries in rural areas** can improve supply-chain efficiency and reduce transportation costs.
 - Linking ethanol units with **FPOs (Farmer Producer Organizations)** can empower local farmers and enhance direct procurement of feedstock.
 - The government should provide **low-interest loans under Mudra Yojana** for small entrepreneurs to set up ethanol plants.
 - Establishing **bio-refinery clusters** in grain-producing states will balance regional ethanol availability.
- **Enhancing Vehicle Compatibility and Fuel Infrastructure:** Mandating **E20-compatible vehicles** by 2025 must be complemented by **incentives for retrofitting older vehicles** to avoid consumer backlash.
 - Collaborating with **automobile manufacturers and IITs** to develop cost-effective engine modifications can ease the transition.
 - Expanding **ethanol-dedicated fuel pumps** across India, especially in non-sugarcane-producing states, will ensure uniform accessibility.
 - Public transport systems should be mandated to use **ethanol-blended fuels**, integrating **Faster**
- **Adoption and Manufacturing of Electric Vehicles (FAME) with biofuel policies** for hybrid solutions.
- **Improving Pricing Stability and Market-Linked Procurement:** A dynamic **Ethanol Price Stabilization Fund** should be created to insulate ethanol producers from raw material price fluctuations.
 - Moving towards a **market-driven ethanol procurement mechanism**, similar to the power sector's **Renewable Energy Certificates (REC)**, can encourage private sector participation.
 - A **carbon credit system** linked to ethanol production can provide financial incentives for industries adopting green fuel.
 - Flexible pricing mechanisms based on **seasonal variations in crop yield and crude oil prices** can make ethanol production more predictable.
- **Addressing Water Sustainability in Ethanol Production:** Shifting towards **water-efficient biofuel crops** through incentives under **PM Krishi Sinchayee Yojana** can reduce excessive water consumption in ethanol production.
 - Promoting **drip irrigation and micro-irrigation systems** for ethanol-linked crops will enhance sustainability.
 - Encouraging ethanol plants to implement **zero-liquid discharge (ZLD) systems** can reduce industrial water pollution.
 - Integrating ethanol plants with **wastewater treatment facilities** under **Namami Gange** can ensure responsible water usage.
- **Accelerating Investment and Private Sector Participation:** A dedicated **Ethanol Infrastructure Development Fund (EIDF)** with tax incentives can attract private investments in ethanol plants.
 - Linking ethanol production with **Make in India** can encourage domestic manufacturing of distillery equipment and fuel additives.
 - **Viability gap funding (VGF)** should be extended to private ethanol plants in non-traditional biofuel states.
 - Expanding **FDI opportunities in biofuel research and development** will bring in global expertise and capital.
 - Enabling **public-private partnerships (PPPs) in ethanol logistics and distribution** will enhance nationwide supply efficiency.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Strengthening Policy Coordination and Governance Framework:** State governments should be encouraged to launch **ethanol-specific industrial policies** to attract investments.
 - Strengthening **interstate ethanol transport regulations** will prevent logistical disruptions and price disparities.
 - A **single-window clearance system for ethanol plant approvals** will reduce bureaucratic delays.
 - Linking **Ethanol Blended Petrol (EBP) Programme with National Green Hydrogen Mission** can create a long-term clean fuel roadmap.

Conclusion:

India's ethanol-blending initiative holds immense potential for **enhancing energy security, reducing carbon emissions, and boosting rural economies**. However, overcoming challenges such as **feedstock shortages, water usage, and infrastructure limitations** is critical to achieving the **20% blending target by 2025**. Strengthening policy support, expanding decentralized production, and improving vehicle compatibility will accelerate progress.



Enhancing Agricultural Productivity and Sustainability

This editorial is based on "Stopping short of the farm" which was published in The Indian Express on 03/01/2025. The article brings into focus the paradox of India's agriculture sector, where 46.1% of the workforce contributes only 17.7% to GDP. It critiques the FY26 budget's incremental approach and emphasizes the need for a shift from subsidies to investment-driven growth for long-term sustainability.

Tag: GS Paper - 3, Direct & Indirect Farm Subsidies, Public Distribution System (PDS), Buffer Stocks & Food Security, Agricultural Marketing

India's agricultural landscape faces a complex set of challenges despite new budgetary initiatives for **FY26**. While the sector employs **46.1% of the workforce**, its GDP contribution has declined to **17.7%**, indicating declining productivity and farmer incomes. The budget's

incremental approach, with just a **4% increase in allocation to Rs 1.49 trillion**, falls short of addressing structural issues like **inadequate R&D investment, post-harvest losses, and climate resilience needs**. The path forward requires a transformational shift from **subsidy-heavy interventions to investment-driven growth**, emphasizing private sector participation and technological advancement.

What are the Key Advancements in Indian Agriculture?

- **Expansion of Irrigation Infrastructure and Water Use Efficiency:** With 55% of India's net sown area under irrigation, the government is pushing for **micro-irrigation, watershed management, and solar-powered irrigation** to optimize water use.
 - Programs like **PM Krishi Sinchai Yojana (PMKSY)** and **Har Khet Ko Pani** are helping improve irrigation efficiency, particularly in drought-prone regions.
 - The **Atal Bhujal Yojana** is tackling groundwater depletion by promoting community-driven water conservation.
 - The Government of India established a **₹5,000 crore Micro Irrigation Fund (MIF)** with **NABARD** to help states expand micro irrigation coverage and mobilize resources.
- **Climate-Smart Agriculture and Resilience Building:** India is increasingly adopting climate-smart agricultural practices to enhance **resilience against extreme weather events, droughts, and soil degradation**.
 - Initiatives like the **National Innovations in Climate Resilient Agriculture (NICRA)** promote adaptive farming techniques, water conservation, and carbon sequestration.
 - The widespread adoption of drought-resistant crop varieties, precision farming, and agroforestry aligns with India's sustainability goals and helps mitigate climate risks.
 - In 2024, the Indian Prime Minister released **109 varieties of 61 crops** including 34 field crops and 27 horticultural crops.
- **Growth of Agri-Tech and Digital Farming:** The rise of **AI, IoT, satellite imaging, and blockchain in agriculture** is transforming farming practices through better weather prediction, soil health monitoring, and smart irrigation.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- The **Digital Public Infrastructure for Agriculture (DPIA)** is integrating farm advisories, credit services, and market linkages into a single digital ecosystem.
- Platforms like **AgriStack**, **e-NAM**, and **ONDC integration** are improving price discovery and supply chain efficiency.
- **e-NAM** has linked 1.78 crore farmers and 2.62 lakh traders as of October 2024. Also, India is currently home to more than **3,000 agritech startups**, of which over 1,300 use emerging and disruptive technologies (EDTs)
- **Strengthening Agricultural Credit and Financial Inclusion:** Access to affordable credit has improved with enhanced **Kisan Credit Card (KCC) limits**, **priority sector lending**, and **interest subvention schemes**.
 - The Budget 2025-26 increased the **KCC limit from ₹3 lakh to ₹5 lakh**, enabling better access to working capital for 7.7 crore farmers. KCC accounts reached 7.75 crore as of March 2024.
 - The **PM Fasal Bima Yojana (PMFBY)** has expanded risk coverage, protecting farmers from climate shocks and has assisted 4 crore farmers till now.
- **Diversification Towards High-Value Crops and Allied Sectors:** Farmers are increasingly shifting from **rice-wheat monoculture to pulses, oilseeds, horticulture, and organic farming**, driven by better returns and climate resilience.
 - The **Atma Nirbhar Pulses Mission** and the **Mission for Fruits & Vegetables (₹500 crore allocation)** aim to boost production and reduce import dependence.
 - Allied sectors like **livestock (12.99% CAGR)** and **fisheries (184 LMT production in 2024)** are outpacing traditional farming.
 - During the last 7 years ending 2021-22, Food Processing sector has been growing at an **Average Annual Growth Rate (AAGR) of around 7.26%**
- **Sustainable Farming and Organic Agriculture Growth:** India is moving towards **natural, organic, and regenerative farming** with initiatives like **Paramparagat Krishi Vikas Yojana (PKVY)**, **National Mission on Natural Farming (NMNF)**, and carbon farming incentives.
 - The push for **climate-smart agriculture and agroforestry** aligns with India's **net-zero**

commitments and SDG goals. Organic food exports are rising, reflecting global demand for chemical-free produce.

- As of March 2024, India has **1.76 million hectares under organic farming**, with 3.63 million hectares in transition to organic cultivation.
- **Policy Reforms and Trade Liberalization in Agriculture:** Government policies are focusing on **export promotion, import substitution, and FDI in agri-processing** to make India a global food hub.
 - The **increase in MSP for pulses and millets** ensures farmer profitability while encouraging sustainable crop choices.
 - Fisheries production reached **184 LMT in 2024**. Also, India's agri-food exports reached **\$46.44 billion in FY24**.
- **Rural Employment and Skilling in Agriculture:** With **46.1% of India's workforce engaged in agriculture**, efforts are being made to increase productivity and incomes through skilling programs.
 - The **Rural Prosperity and Resilience Program**, announced in Budget 2025-26, aims to **reduce underemployment by integrating investment, technology, and skill development**.
 - Agri-MSMEs and **FPOs (Farmer Producer Organizations)** are being supported to create rural employment opportunities.
 - The government is aiming to meet the target of 10,000 new farmer producer organisations (FPOs) by the end FY25

What are the Factors Hindering Agricultural Productivity and Efficiency in India?

- **Declining Landholding Size and Land Fragmentation:** With **rising population pressure and inheritance laws**, Indian farms are becoming smaller and fragmented, reducing economies of scale and mechanization feasibility.
 - Small landholdings make **modern irrigation, high-tech farming, and precision agriculture** less viable, affecting overall productivity.
 - The absence of a **vibrant land leasing market** and restrictive land tenure laws further deter large-scale investment in agriculture.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Land pooling mechanisms and cooperative farming models** can offer solutions, but adoption remains slow.
- **86.1% of Indian farmers** are small and marginal (SMF) ie, have a landholding size smaller than 2 hectares.
 - The average farm size declined from 2.28 hectares (1970-71) to **1.08 hectares (2015-16)**.
- **Overdependence on Monsoon and Low Irrigation Coverage:** Despite progress, **India's agriculture remains highly monsoon-dependent**, making it vulnerable to erratic rainfall and climate change.
 - Only **55% of net sown area is irrigated**, leaving the remaining **45% exposed to drought risks**.
 - Traditional irrigation systems are inefficient, with high water wastage due to poor canal maintenance.
 - While **PM Krishi Sinchai Yojana (PMKSY) and micro-irrigation initiatives** aim to improve water use efficiency, adoption remains slow due to **high initial costs and lack of awareness**.
 - A recent survey by the Forum of Enterprises for Equitable Development (FEED) found that **drought (41%), irregular rainfall (32%), and timing issues with monsoons (24%)** were the main causes of crop damage.
 - Nearly 43% of farmers reported losing at least half of their crops.
- **Soil Degradation and Declining Soil Fertility:** Excessive use of **chemical fertilizers, pesticides, and monoculture cropping (especially rice and wheat)** has depleted soil nutrients and degraded land.
 - Intensive **Green Revolution** practices have led to **salinity, waterlogging, and loss of organic carbon**, reducing soil productivity.
 - Though initiatives like **Soil Health Card Scheme and Natural Farming Mission** promote sustainable practices, their adoption remains limited.
 - About **1 millimetre of topsoil** is lost annually in India due to soil (water) erosion at an average rate of 16.4 tons per hectare per year.
- **Low Investment in Agricultural Research and Development (R&D):** Agricultural productivity in India lags due to **low R&D spending, limited extension services, and inadequate technology adoption**.
 - While high-yielding and climate-resilient crops are crucial for sustainable growth, **investment in seed research and biotechnology remains below global benchmarks**.
 - Currently, India invests **less than 0.5% of its agricultural GDP in R&D**, a figure that pales in comparison to global benchmarks.
- **Inefficiencies in Agricultural Marketing and Price Realization:** Farmers receive only **30-40% of the final consumer price**, as inefficient **APMC markets, excessive middlemen, and poor logistics** reduce their earnings.
 - Weak **market linkages, lack of processing infrastructure, and fragmented value chains** further impact profitability.
 - India suffers a food loss of about **Rs. 1.53 trillion** every year as per the latest large-scale study conducted by NABCONS during **2020 to 2022**.
- **MSP-Centric Procurement and Lack of Crop Diversification:** The **MSP system is skewed towards rice and wheat**, discouraging farmers from growing pulses, oilseeds, and high-value crops.
 - This leads to **water-intensive farming, soil degradation, and market imbalances**, with excess grain stocks and insufficient pulses/oilseeds production.
 - While the **Atma Nirbhar Pulses Mission** and **crop-neutral incentive proposals** aim to address this, a significant policy shift is required.
- **Low Mechanization and Farm Technology Adoption:** A 2022 report reveals that only 47% of agricultural operations in India are mechanized, lagging behind developing nations like **China (60%) and Brazil (75%)** in farm mechanization.
 - Small farm sizes, high machinery costs, and lack of affordable financing hinder mechanization.
 - The push for **drones, AI-driven precision farming, and IoT-based smart irrigation** under **Digital Public Infrastructure for Agriculture (DPIA)** is promising, but widespread adoption is slow.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



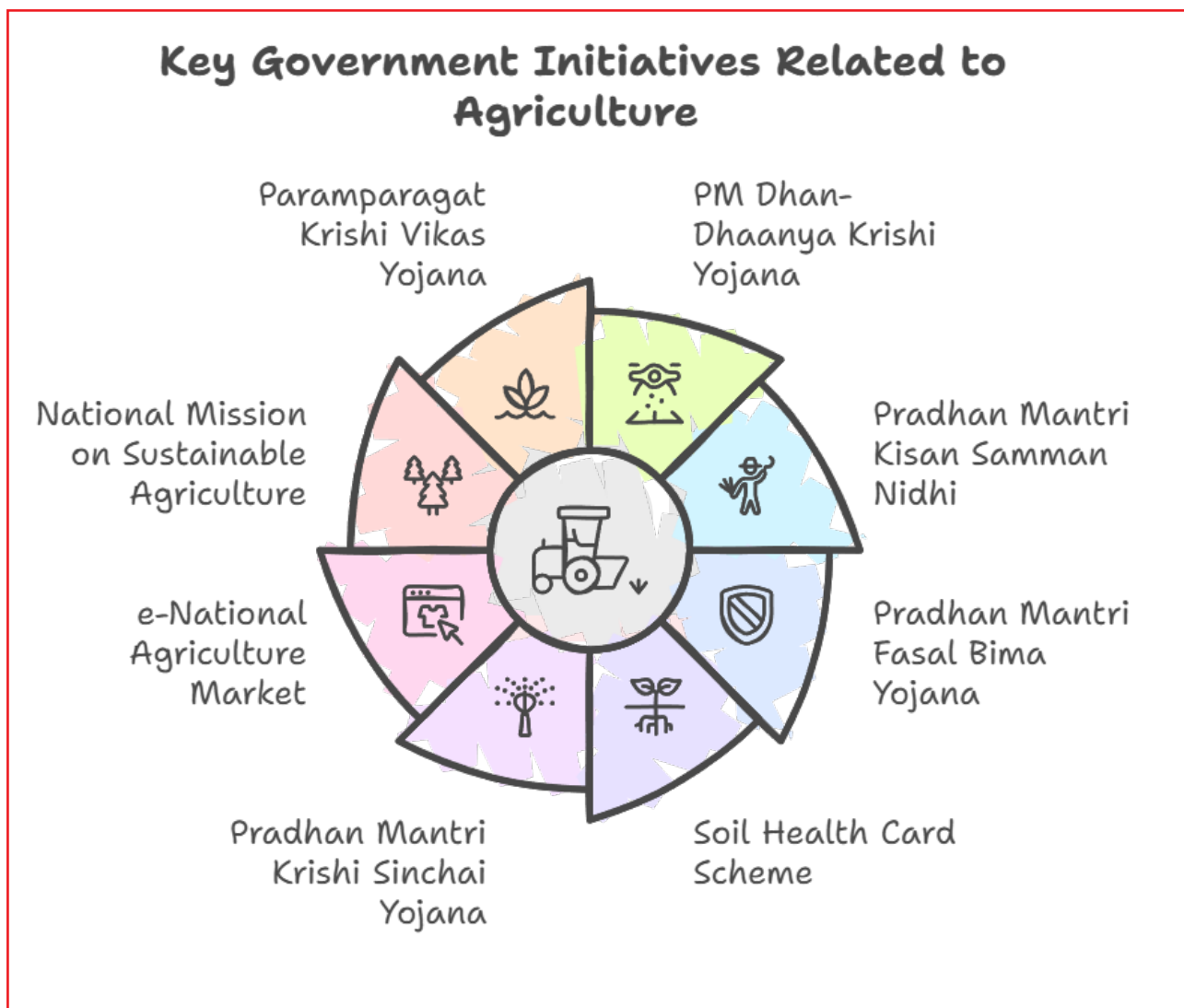
IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Disguised unemployment and Stagnant Farm Wages:** Despite declining agriculture's GDP share (16% in FY24), its workforce share increased to 46.1%.
 - Low farm wages and disguised unemployment persist due to the **inability of urban sectors to absorb surplus labour**.
 - Real rural wages remained stagnant in FY24; majority of agricultural employment comprises farm labourers, often earning below minimum wage.



What Measures can be Adopted to Enhance Agricultural Productivity and Efficiency in India?

- **Land Consolidation and Promotion of Cooperative Farming:** Fragmented landholdings reduce mechanization, efficiency, and economies of scale.
 - **Land pooling mechanisms, cooperative farming models, and digitization of land records** can enable small farmers to access modern technologies and credit.
 - Encouraging **contract farming** and **Farmer Producer Organizations (FPOs)** can improve collective bargaining power and market linkages.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Streamlining land leasing laws will ensure better land utilization without ownership disputes.
 - **Budget 2025-26's** focus on land digitization is a step forward.
- **Expanding Micro-Irrigation and Watershed Development:** Irrigation efficiency is critical as **45% of India's farmland still relies on monsoon**.
 - Drip and sprinkler irrigation, treated wastewater reuse, and decentralized rainwater harvesting must be scaled up, especially in semi-arid regions.
 - **Integration of PM Krishi Sinchai Yojana (PMKSY) with Atal Bhujal Yojana** can ensure both groundwater conservation and efficient irrigation.
 - Incentivizing solar-powered irrigation pumps will further reduce dependence on diesel-based water extraction.
- **Strengthening Agri-R&D and Climate-Resilient Farming:** Increasing investment in public-private partnerships for biotech research, precision agriculture, and AI-driven farm advisories is crucial.
 - Programs like the **National Mission on High-Yielding Seeds** should be expanded to focus on pulses and oilseeds.
 - Integrating climate-resilient seed varieties with **PM Fasal Bima Yojana (PMFBY)** will enhance productivity while mitigating climate risks.
- **Enhancing Agricultural Credit and Financial Inclusion:** Increasing institutional credit penetration, streamlining Kisan Credit Card (KCC) access, and linking it with digital platforms like **AgriStack** will ensure financial stability for farmers.
 - The **KCC limit increase from ₹3 lakh to ₹5 lakh** is a positive step, but rural banks and cooperative societies need to be strengthened.
 - Developing crop-specific insurance products under **PMFBY** will protect against market fluctuations.
- **Revamping Agricultural Marketing and Strengthening e-NAM:** Recent studies show that farmers receive **only 33% of the consumer price for tomatoes**, 36% for onions, and 37% for potatoes.
 - Integrating e-NAM with ONDC, promoting **direct farm-to-market models**, and expanding **Farmer Producer Organizations (FPOs)** will ensure better price realization.
 - Investing in rural logistics, cold storage, and warehousing under **Agriculture Infrastructure Fund (AIF)** is essential to reduce post-harvest losses.
 - **Agri-export zones and cluster-based farming models** can make India a global food supplier.
- **Diversification Towards High-Value and Climate-Smart Crops:** Overdependence on rice and wheat depletes soil health and leads to overproduction, straining MSP procurement.
 - Promoting pulses, oilseeds, millets, horticulture, and agroforestry can boost incomes and sustainability.
 - Aligning **Atma Nirbhar Pulses Mission** with crop-neutral incentives will help reduce import dependence.
 - Developing organic farming clusters and GI-tagged regional crops can create export opportunities.
- **Strengthening Sustainable and Natural Farming Practices:** Chemical-intensive farming has degraded soil and water quality, necessitating a shift towards zero-budget natural farming, agroforestry, and bio-fertilizers.
 - Linking carbon credit markets with sustainable farming incentives can provide additional income sources for farmers practicing regenerative agriculture.
 - Government initiatives like the **National Mission on High Yielding Seeds** and **PM Dhan-Dhaanya Krishi Yojana** aim to boost output in low-productivity districts.
- **Reducing Post-Harvest Losses:** Investing in modern storage, cold chains, and rural food processing parks will minimize losses and create value-added agri-products.
 - Strengthening **PM Kisan Sampada Yojana** and linking it with the **Horticulture Mission** can boost processing capacity.
 - Private sector participation in storage infrastructure through viability gap funding should be encouraged.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



Conclusion:

While India's agricultural sector has made progress but faces challenges like **land fragmentation, monsoon dependence, and soil degradation**. To unlock its full potential, India needs to focus on **sustainable practices, climate-resilient technologies, better infrastructure, and policy reforms**. Enhancing private sector involvement and improving agricultural marketing can ensure food security, higher farmer incomes, and long-term growth.



Boosting India's Shipbuilding Industry

This editorial is based on "[Some wind behind the sails of India's shipping industry](#)" which was published in The Hindu on 04/02/2025. The article brings into picture the stagnation of India's shipping industry, despite strong GDP growth and ₹5.8 lakh crore Sagarmala investments, as it faces a declining global ranking and minimal fleet expansion. While initiatives like the ₹25,000 crore Maritime Development Fund in Budget 2025 are promising, more reforms are essential to rejuvenate the sector.

Tag: GS Paper - 2, Government Policies & Interventions, GS Paper - 3, Growth & Development, Infrastructure

Despite India's robust GDP growth and significant maritime investments through the **Sagarmala programme (₹5.8 lakh crore by 2035)**, the nation's **shipping industry** remains stagnant with minimal growth in cargo handling and vessel numbers. The Indian fleet, though recently improved to an average age of 21 years, has seen India's global ranking in ship ownership decline from **17th to 19th position**. While the government's recent Budget 2025 announcements, including a **₹25,000 crore Maritime Development Fund and infrastructure status for vessels**, are positive steps, but India still needs to focus on several key areas to revitalize its shipping sector.

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

- **About:** In 2024, the Indian shipbuilding industry is valued at **\$1.12 billion**, which is a significant jump from the valuation of **\$90 million** back in 2022.

- India is home to 13 **major ports**, over 200 other ports, 30 shipyards with both public and private sector players. The major shipyards include:

- **Public Sector:**

- Cochin Shipyard Ltd. (CSL)
- Hindustan Shipyard Ltd. (HSL)
- Garden Reach Shipbuilders & Engineers (GRSE)
- Mazagon Dock Shipbuilders Ltd. (MDL)

- **Private Sector:**

- L&T Shipbuilding
- Reliance Naval & Engineering Ltd. (RNEL)

- **Government Initiatives & Policy Support**

- **Shipbuilding Financial Assistance Policy (2016-2026)** – Provides subsidies of up to **20%** on shipbuilding contracts.
- **Sagarmala Programme** – Aims to modernize ports, develop coastal shipping, and enhance logistics efficiency.
- **Atmanirbhar Bharat in Shipbuilding** – Focus on **indigenous warship production**, including aircraft carriers (INS Vikrant).
 - India needs about 700 commercial ships (200 ocean-going and 500 coastal/inland) to progressively replace the older ones by **2047**.
- **Gati Shakti Initiative** – Infrastructure push to boost shipbuilding-related logistics.

Why Investing in the Shipbuilding Sector is Crucial for India?

- **Economic Growth and Global Market Share Expansion:** Investing in shipbuilding can **create a multiplier effect** by boosting manufacturing, generating employment, and strengthening ancillary industries like steel and electronics.
 - With India's **rising global trade**, a robust domestic shipbuilding sector can **reduce foreign dependence and enhance exports**.
 - India's shipbuilding industry grew from \$90 million (2022) to \$1.12 billion (2024), with projections of \$8 billion by 2033 (CAGR 60%).
 - **Maritime India Vision 2030** aims to push India to the top 10 shipbuilding nations by 2030.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Strategic and Defense Preparedness:** A strong shipbuilding sector is **critical for national security**, ensuring self-reliance in manufacturing warships, submarines, and patrol vessels.
 - Strengthening indigenous shipbuilding **aligns with Atmanirbhar Bharat**, reducing foreign dependency and securing maritime borders more effectively.
 - Under **Project 75**, six Scorpene-class submarines (Kalvari class) have been constructed indigenously **(at Mazagon Dock Shipbuilders Limited Mumbai)**
- **Supporting Coastal and Blue Economy Development:** Shipbuilding is an integral part of **India's Blue Economy**, which includes fisheries, port development, and marine tourism.
 - A strong shipbuilding industry **enhances inland and coastal shipping**, reducing logistics costs and **decongesting road and rail networks**.
 - Additionally, it can help **India tap into deep-sea exploration for minerals and hydrocarbons**, improving energy security.
 - The **Blue Economy contributes 4% to India's GDP**. Sagarmala Program targets port-led development, coastal economic zones and waterway expansion.
- **Strengthening Renewable and Green Shipping:** With **Net Zero 2070 goals**, India needs a sustainable shipbuilding sector that produces **low-emission, fuel-efficient vessels**.
 - Investment in **green hydrogen-powered and electric vessels** will help India **comply with International Maritime Organization (IMO) norms**.
 - Developing **green shipyards** will also boost India's standing in global sustainable shipping.
 - Cochin Shipyard launched **India's first hydrogen fuel-powered ferry in 2024**, aligning with India's **Green Hydrogen Mission**.
- **Enhancing India's Role in Global Supply Chains:** A robust shipbuilding sector strengthens India's position in **global maritime supply chains**, making it a **preferred destination for ship manufacturing, repair, and leasing**.
 - This reduces the **dependency on East Asian nations** and aligns with global supply chain diversification trends.
 - India can also **attract foreign direct investment (FDI)** in maritime manufacturing.

What are the Key Issues Hindering the Growth of the Shipbuilding Sector in India?

- **Lack of a Competitive Shipbuilding Ecosystem:** India's shipbuilding industry suffers from **long construction timelines, and inconsistent quality standards**, making Indian-built ships less competitive in the global market.
 - Unlike China, South Korea, and Japan, **India lacks a well-integrated maritime cluster** with shipyards, component suppliers, and advanced R&D facilities in close proximity.
 - Additionally, **delays in project execution** due to bureaucratic hurdles further reduce competitiveness.
 - India ranks **20th in global shipbuilding with only a 0.06% share**, while **China alone holds over 50%**.
 - The annual shipbuilding output of Indian shipyards is **only 0.072 million GT**, which needs to increase to **0.33 million GT by 2030** to meet the Maritime India Vision (MIV) 2030 goals.
- **High Capital Costs and Lack of Financing:** Shipbuilding is a **capital-intensive industry** requiring significant upfront investment in shipyards, machinery, and skilled labor.
 - Indian shipbuilders **struggle to secure low-cost financing**, unlike their global competitors who receive **strong state-backed financial support**.
 - The absence of **long-term shipbuilding credit facilities and a dedicated maritime financing institution** further weakens India's competitive edge.
 - **China heavily subsidizes its domestic shipbuilding industry** while imposing restrictions on foreign competitors, limiting non-Chinese shipbuilders' market access, while Indian shipyards rely on expensive commercial bank loans.
- **Heavy Dependence on Imported Raw Materials and Components:** India's shipbuilders depend on foreign suppliers for critical components like marine-grade steel, navigation systems, and propulsion equipment, leading to high costs and supply chain vulnerabilities.
 - Despite **Make in India**, domestic manufacturing of shipbuilding components remains weak.
 - India's imports of ships, boats, and floating structures, though declined, is still at **USD 479.60 million in 2023**.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Infrastructure Bottlenecks and Lack of Modern Shipyards:** India's shipyards are **smaller and less automated** compared to global leaders, leading to **higher production costs and longer construction times**.
 - Many government shipyards **operate with outdated machinery and inadequate dry docks**, limiting their ability to build larger vessels.
 - Moreover, **port congestion and poor logistics** add to the inefficiencies in the shipbuilding supply chain.
 - **Cochin Shipyard's largest dry dock is 310m**, while China's Shanghai Waigaoqiao Shipyard is the largest dry dock in the world, **allowing it to build mega-ships**.
- **Absence of a Strong Domestic Market for Shipbuilding:** Unlike China, which has a **large domestic demand for new vessels**, India's **shipping companies prefer to buy second-hand foreign ships** rather than ordering new ones from Indian shipyards.
 - This is due to **high costs, longer delivery times, and lack of financing options** for Indian-built ships.
 - Without a strong domestic order book, Indian shipyards **struggle to scale up production and reduce costs**.
- **Weak Repair and Maintenance Ecosystem:** While India has a growing merchant navy and defense fleet, its **ship repair and maintenance (MRO) capabilities remain underdeveloped**.
 - India's share in the **global ship repair market is less than 1%**. Many Indian shipowners prefer **sending vessels to Singapore, China, or the UAE for repairs**, instead of Indian shipyards, due to cost and quality concerns.
 - The lack of **state-of-the-art dry docks and repair infrastructure** limits India's ability to capture the lucrative ship repair market.
- The **Production Linked Incentive (PLI) scheme for advanced manufacturing** can be expanded to cover key shipbuilding components, encouraging domestic production.
- Additionally, linking **Make in India with the Sagarmala program** can create dedicated maritime industrial zones near ports.
 - A phased manufacturing program (PMP) can also be introduced to **boost indigenization in a structured manner**.
- **Establishing a Dedicated Shipbuilding Finance:** A **dedicated Shipbuilding and Maritime Financing Institution** under the Public-Private Partnership (PPP) model can provide **low-interest loans, export credit, and ship leasing options**.
 - This can be linked to the **National Infrastructure Pipeline (NIP)** to ensure structured financing.
 - A **Shipbuilding Export Promotion Fund** can also help Indian shipyards compete globally by offering credit at concessional rates.
- **Revamping and Expanding Existing Shipyard Infrastructure:** There is a need to expedite the passage of **Development of Enterprise and Service Hubs (DESH) Bill 2022**, that can be leveraged to create **Maritime SEZs**, allowing shipbuilders to access world-class logistics, technology, and tax benefits.
 - Existing public-sector shipyards like **Cochin Shipyard, Mazagon Dock, and Hindustan Shipyard** should be modernized under the **Public-Private Partnership (PPP) model**, inviting global expertise and investment.
 - Also, **India needs to classify ships in the infrastructure list** as recommended by **Rangarajan Commission**.
- **Creating Sustained Domestic Demand for Indian-built Ships:** The **Inland Waterways Authority of India (IWAI)** and the **Ministry of Ports** should adopt a **Buy Indian Policy**, ensuring that all future government and defense ship orders are placed with Indian shipyards, in the lines of Positive Indigenisation list by Ministry of Defence.
 - Additionally, linking the **PM Gati Shakti initiative with shipbuilding** can boost demand for **cargo vessels, passenger ferries, and coastal transport ships**.

What Measures can India Adopt to Accelerate the Growth of India's Shipbuilding Sector?

- **Strengthening Domestic Manufacturing of Shipbuilding Components:** Reducing dependence on **imported marine-grade steel, propulsion systems, and navigation equipment** is critical to making Indian-built ships cost-competitive.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Integrating Shipbuilding with Renewable Energy and Green Shipping:** To align with India's **Net Zero 2070 goals**, the shipbuilding sector must transition to **low-emission, green hydrogen-powered, and electric vessels**.
 - The **National Green Hydrogen Mission** can be integrated with shipbuilding to develop **hydrogen-powered ships and fueling infrastructure**.
 - Additionally, **PLI schemes for battery storage and electric mobility** can be extended to promote electric-powered inland and coastal vessels, reducing reliance on diesel-powered ships.
- **Maritime Cluster for Research, Innovation, and Skill Development:** The lack of **high-end R&D and industry-academia collaboration** has slowed India's innovation in advanced shipbuilding technologies.
 - A **National Maritime Innovation Hub** should be set up under **Maritime India Vision 2030**, encouraging startups, defense R&D, and private shipbuilders to collaborate on **smart ships, AI-based navigation, and modular ship design**.
 - Integrating the **Skill India program** with shipbuilding **training institutes** can also ensure a steady supply of skilled workers for the industry.
- **Financial Assistance and Incentives for Private Shipyards:** Currently, only a few **government shipyards** receive major defense and commercial ship orders, leaving private players underutilized.
 - Expanding the **Shipbuilding Financial Assistance Policy (SFAS) beyond 2026** and simplifying its approval process can encourage private investments.
 - The **Viability Gap Funding (VGF) scheme** can also be extended to provide **initial capital subsidies** for setting up new shipyards and upgrading existing ones.
- **Strengthening India's Position in Global Shipbuilding Supply Chains:** India must **leverage Free Trade Agreements (FTAs)** with ASEAN and the US to become an export hub for ships and maritime equipment.
 - Establishing **co-production agreements with leading global shipbuilders like Hyundai, Mitsubishi, and Daewoo** can help India acquire advanced shipbuilding technology.
- **Reducing Bureaucratic Delays and Improving Ease of Doing Business:** The **shipbuilding approval process in India is complex**, involving multiple ministries and regulatory bodies.

- Establishing a **Single-Window Clearance System** for shipbuilding approvals can **reduce delays, simplify tax structures, and streamline licensing**.
- Additionally, **harmonizing tax incentives across states** will attract investments and prevent policy inconsistencies that discourage private participation.

Conclusion:

India's shipbuilding sector holds immense potential for **economic growth, maritime security, and global supply chain integration**, but structural challenges like high capital costs, outdated infrastructure, and heavy reliance on imports hinder progress. While initiatives like the Maritime Development Fund and infrastructure status for vessels are positive steps, stronger policy interventions, domestic manufacturing incentives, and financing support are crucial.



Unlocking India's MSME Potential

This editorial is based on "New definition for MSMEs, increased credit guarantee" which was published in The Indian Express on 02/01/2025. The article brings into picture the expansion of MSME investment and turnover limits to boost growth and manufacturing. However, deeper policy interventions and structural reforms are needed to tackle persistent challenges.

Tag: GS Paper - 2, Government Policies & Interventions, GS Paper - 3, Mobilization of Resources

The government has recently announced plans to expand the **Ministry of Micro, Small and Medium Enterprises (MSME)** investment and turnover limits, allowing more businesses to benefit from the sector's advantages. With over **1 crore MSMEs employing 7.5 crore people** and contributing significantly to manufacturing and exports, they remain a key driver of growth. The revised classification aims to raise investment limits to **Rs 2.5 crore for micro, Rs 25 crore for small, and Rs 125 crore for medium enterprises**, with higher turnover thresholds. These reforms aim to boost MSME growth and strengthen India's **manufacturing** potential. However, challenges remain, **requiring deeper policy interventions and structural reforms for long-term resilience**.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



New classification of MSME

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

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

What is the Role of MSMEs in India's Economic Growth?

- **Employment Generation & Livelihood Support:** MSMEs are the largest source of non-agricultural employment in India, especially for **semi-skilled and unskilled workers**, fostering inclusive growth in rural and urban areas.
 - The rise of digitalization and fintech solutions has further enabled micro-enterprises to access financial markets and scale operations.
 - Scheme like **PM Vishwakarma scheme** and **Mudra Yojana expansion** (₹5.41 lakh crore sanctioned in FY24) have further boosted self-employment.
 - India has over **1 crore registered MSMEs**, providing employment to nearly **7.5 crore** people.
- **Contribution to GDP & Industrial Growth:** MSMEs significantly contribute to India's economic resilience by driving domestic production, industrial expansion, and localized supply chains.
 - They support large industries by supplying raw materials and intermediates, making them a critical component of industrial clusters.
 - With rising formalization through the **Udyam portal** (**4 crore MSMEs registered as of March 2024**), their role in structured economic growth is expanding.
 - As of recent reports, the **MSME contribution stands at around 30% of India's total GDP** and **45% of manufacturing output**.
- **Boosting Exports & Foreign Exchange Earnings:** MSMEs are pivotal in global trade, with their unique products catering to niche international markets, especially in textiles, leather, and engineering goods.
 - **Government e-Marketplace (GeM)** and the **Production-Linked Incentive (PLI)** scheme have strengthened MSME participation in global supply chains.
 - In 2023-24, MSME-related products accounted for **45.73% of India's total exports**, reinforcing their role in positioning the country as a global manufacturing hub.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Driving Digital & Technological Transformation:** With increased adoption of digital payments, automation, and AI-driven solutions, MSMEs are transitioning into tech-driven enterprises.
 - Government initiatives such as **ONDC (Open Network for Digital Commerce)** and the **₹1 lakh crore interest-free innovation corpus (Budget 2024)** encourage digital integration.
 - **72% of MSME transactions are now digital**, and RBI's Public Tech Platform for Frictionless Credit is improving access to non-collateral loans.
 - Initiatives like in aerospace (**Boeing contract for Tamil Nadu MSME**) and pharma (**Aragen Life Sciences' ₹2,000 crore investment in Hyderabad**) are fostering a robust **start-up ecosystem**.
- **Enhancing Women & Social Entrepreneurship:** **Women-led MSMEs** are emerging as drivers of social change, improving gender equity and economic empowerment.
 - Credit access through the Mudra Yojana has sanctioned ₹32.36 lakh crore for 51.41 crore loans, with **68% of the loans benefiting women**, enabling more women entrepreneurs to scale businesses.
 - Women-owned MSMEs now constitute **20.5% of Udyam registrations**, reflecting their growing role in the economy.
- **Strengthening Rural Economy & Agri-Based Enterprises:** Rural MSMEs help reduce migration to cities by creating localized job opportunities and supporting agro-processing industries.
 - The **PM Vishwakarma Scheme (₹13,000 crore outlay)** and **Self-Reliant India (SRI) Fund (₹50,000 crore corpus)** are enhancing rural industrialization.
 - Also, under the Animal Husbandry Credit Guarantee Scheme (2023), livestock MSMEs now get collateral-free loans, boosting India's dairy and meat processing industries.
- **Facilitating Green & Sustainable Growth:** MSMEs are at the forefront of India's green industrial revolution

by adopting clean energy solutions and circular economy models.

- The **RAMP scheme** (with World Bank support) and Telangana MSME Policy (₹4,000 crore to boost MSMEs and entrepreneurship) emphasize sustainability.

What are the Key Issues Hindering the Growth of MSME Sector?

- **Limited Access to Credit & Financial Constraints:** MSMEs often struggle with inadequate financing due to **stringent collateral requirements** and risk-averse banking policies.
 - The dependence on informal credit sources increases their operational costs and limits scalability.
 - Despite government-backed schemes, disbursement delays and lack of awareness hinder effective utilization.
 - According to estimates, **less than 40% of MSMEs** avail credit from formal financial systems. The recent increase in **CGTMSE guarantees** has helped, but only **2.5 crore out of 6.3 crore MSMEs have availed formal credit**, highlighting a major gap.
 - Also, delayed payments from large corporations and government departments create severe cash flow issues, making survival difficult.
 - A 2022 report estimated that **delayed payments to MSMEs** in India total around **₹10.7 lakh crore, or 6% of the country's GVA**.
- **Regulatory Burden & Compliance Complexity:** MSMEs face **cumbersome regulatory procedures**, frequent policy changes, and high compliance costs, limiting ease of doing business.
 - Multiple overlapping laws across labor, taxation, and environmental regulations create bureaucratic roadblocks.
 - The **Economic Survey 2024-25** calls for **urgent deregulation to boost MSME growth**, stressing that excessive regulatory burdens hinder business efficiency and innovation

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Lack of Skilled Workforce & Technological Gaps:** Limited access to a skilled workforce and low technological adoption reduce productivity and competitiveness.
 - Most MSMEs rely on outdated machinery and lack the financial capability to invest in automation and AI-driven solutions.
 - Only **6% of MSMEs** actively use e-commerce platforms for sales, highlighting limited digital adoption in the sector.
 - According to a survey by the Ministry of MSMEs, **only 45% of MSMEs** have adopted some form of AI in their operations
- **Infrastructure Bottlenecks:** Poor road connectivity, inefficient rail freight systems, and high logistics costs hinder timely movement of goods, reducing MSME competitiveness.
 - **Frequent power outages** and high industrial electricity costs affect production efficiency, especially in rural and semi-urban MSME clusters.
 - **Limited access to high-speed internet, lack of industrial parks**, and inadequate common facility centers restrict MSMEs from leveraging technology and scaling operations.
 - Also, **most industrial clusters are concentrated in a few states**, leaving MSMEs in other regions with poor infrastructure support, limiting their integration into national and global supply chains.
- **Market Access & Global Competitiveness Challenges:** MSMEs struggle with limited access to international markets due to **inadequate branding, lack of export incentives, and stringent quality standards**.
 - **High logistics costs** and limited integration with global value chains (GVCs) further reduce competitiveness.
 - The **Economic Survey 2022-23** pointed out that logistics costs in India have been in the **range of 14-18% of GDP** against the global benchmark of 8%.
- **Lack of Awareness & Utilization of Government Schemes:** Despite multiple government schemes, many MSMEs fail to take advantage due to low awareness and bureaucratic hurdles.
 - Complex application processes and lack of proper guidance deter small businesses from availing benefits.
 - The situation is worse for first-time entrepreneurs and rural MSMEs who struggle with formal banking procedures.
 - As of Nov 2024, **₹2.57 lakh crore** was sanctioned under Mudra Yojana, but **many eligible businesses remain outside the credit net**.
- **Environmental & Sustainability Compliance Pressure:** With increasing global ESG (Environmental, Social, and Governance) standards, MSMEs face difficulties in meeting sustainability norms.
 - A 2018 report by the Centre for Study estimated that **Indian MSMEs produce around 110 million tonnes of CO₂ annually**. This highlights their significant carbon footprint and environmental impact.
 - High costs of adopting green technology and lack of incentives deter small enterprises from transitioning to eco-friendly practices.
 - **Many export-driven MSMEs risk losing international clients** due to non-compliance with global carbon footprint norms.
 - For instance, **Europe's Carbon Border Adjustment Mechanism**, which levies a carbon tax on certain exports into the EU, **is expected to hurt India's steel industry**.
- **Lack of Formalization:** A significant portion of MSMEs remains **unregistered**, leading to a lack of reliable data, weak policy implementation, and limited access to **institutional support**.
 - Informal businesses struggle with financial inclusion, making it difficult for them to avail government benefits, structured credit, and insurance schemes.
 - The **absence of formal labor contracts** results in **poor enforcement of labor codes**, leaving workers without essential social security benefits like ESI, PF, and health insurance.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



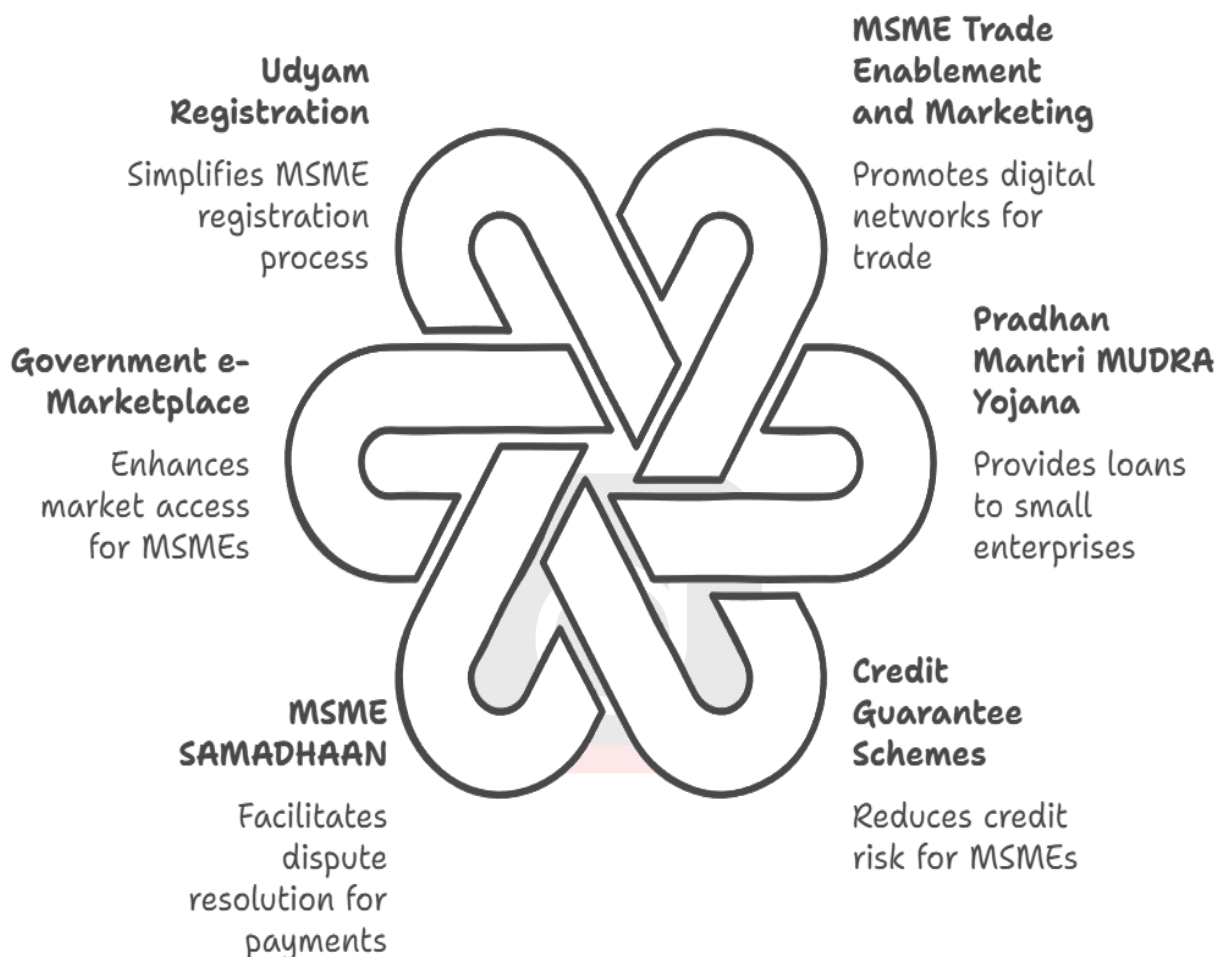
IAS Current
Affairs Module
Course



Drishti
Learning
App



Government Initiatives Related to MSMEs



What Measures can be Adopted to Revamp the MSME Sector in India?

- **Strengthening Formal Credit Access & Reducing Financial Bottlenecks:** Expand collateral-free lending via fintech and digital platforms. Integrate **Mudra Yojana & CGTMSE** for better risk coverage.
 - Establish **MSME Credit Monitoring Cell** to track loan delays. Promote **factoring services & invoice discounting** to ease cash flow. Also, MSME finance companies can be established.
 - Mandate **strict payment timelines** under the MSME Samadhan portal.
 - Link **TReDS & GeM procurement** for faster invoice settlements. Encourage **public sector units & large corporates** to prioritize MSME payments.
- **Streamlining Regulatory Framework & Reducing Compliance Burden:** Implement **single-window clearance** for MSME approvals. Strengthen **RAMP scheme** to cut red tape and lower compliance costs. Establish **self-declaration mechanisms** for minor regulatory filings.
 - Form **state-level MSME facilitation councils** for faster grievance redressal.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Boosting Market Access & Global Competitiveness:** Promote **export-oriented MSMEs** via Free Trade Agreements (FTAs) & global supply chains.
 - Expand **PLI schemes & cluster-based development** to strengthen local industries.
 - Improve **e-commerce integration** with ONDC & GeM for direct market reach.
 - Provide **subsidized branding & certification support** for international markets.
- **Enhancing Digital & Technological Adoption:** Facilitate **AI, IoT, & automation adoption** through MSME tech hubs. Integrate **Udyam & ONDC platforms** for seamless digital onboarding.
 - Launch **Digital MSME 2.0** to improve cybersecurity, cloud access, and e-commerce participation.
 - Expand **Skill India & PM Vishwakarma Scheme** to create sector-specific training programs.
 - Establish **MSME Apprenticeship Hubs** in industrial clusters.
- **Reducing Raw Material Costs & Supply Chain Constraints:** Develop **MSME-focused raw material banks** to ensure stable pricing.
 - Encourage **domestic manufacturing of key inputs** under the Atma Nirbhar Bharat initiative.
 - Strengthen **warehousing & logistics parks** for better inventory management. Implement **cluster-based procurement models** to reduce costs.
 - Promote **bulk buying cooperatives** for MSMEs to access cheaper raw materials.
- **Strengthening Rural & Agri-Based MSMEs:** Expand **PM Vishwakarma Scheme & SFURTI clusters** for artisan-based enterprises.
 - Provide **targeted financial incentives for rural industries** in agro-processing and handicrafts.
 - Strengthen **cooperative-based business models** to scale rural MSMEs. Promote **cold storage & rural supply chain networks** for agri-MSMEs.
 - Develop **MSME-friendly agricultural export hubs** to link small farmers with global markets.
- **Promoting Green MSMEs & Sustainable Growth:** Expand **Green MSME certification programs** for eco-friendly businesses.
 - Provide **low-interest green finance** for renewable energy adoption.
 - Establish **circular economy incentives** to reduce waste and boost recycling enterprises. Promote **ESG-linked credit programs** for sustainable business practices.
- **Strengthening Women & Social Entrepreneurship in MSMEs:** Provide **higher credit guarantee cover** for women-led MSMEs under CGTMSE.
 - Expand **Mudra Yojana's dedicated women entrepreneur fund**. Link **self-help groups (SHGs) with MSME clusters** for financial inclusion.
 - Encourage **co-working spaces & mentorship programs** for women entrepreneurs. Improve **market access through GeM for women-owned enterprises**.
- **Enhancing Disaster Resilience & Crisis Management:** Develop an **MSME Disaster Recovery Fund** for economic shocks. Strengthen **insurance schemes** to cover pandemic-like disruptions.
 - Implement **flexible credit restructuring policies** during downturns. Promote **alternative credit sources like crowdfunding & peer-to-peer lending**.
- **Formalization of MSMEs & Strengthening Institutional Support:** Implement **mandatory Udyam registration** with incentives like **lower GST rates & priority lending benefits** to encourage formalization.
 - Link **formal registration with access to government schemes, GeM procurement, and credit guarantee programs** for better participation.
 - **25% of annual procurement by Central Ministries/ Departments/Public Sector Enterprises (CPSEs)** has to be made from Micro & Small enterprises is a significant step in the right direction.
 - Strengthen enforcement of **labor codes** while ensuring ease of compliance for small businesses. Integrate **MSME databases with Aadhaar, GSTIN & banking systems** to improve policy targeting and implementation.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



Key Recommendations of Standing Committee on Finance Report on MSME Credit (April 2022)

- **Bridging Credit Gap through a Digital Ecosystem:** The Committee recommended leveraging digital platforms like Udyam, Aadhaar, and BHIM UPI to reduce transaction costs, eliminate physical collateral requirements, and enable quicker loan approvals. *(Example: Udyam portal can serve as a central repository for lenders to verify MSME credentials.)*
- **Adopting an Account Aggregator Framework:** Secure digital financial data sharing can improve access to credit, prevent fraud, and reduce NPAs. *(Example: SAHAY GST platform enables instant digital lending using GST invoices as an alternative to physical collateral.)*
- **Shifting to Cash-flow Based Lending:** Instead of traditional asset-backed lending, MSME loans should be based on real-time cash flow and revenue generation. *(Example: Linking GSTIN to the account aggregator framework to allow regulated entities access to transaction data for better credit assessment.)*
- **Accelerating MSME Formalisation:** Less than 40% MSMEs have access to formal credit, leading to dependence on high-cost informal sources. Linking credit access to GST invoices can encourage more MSMEs to register under GST. *(Example: Providing working capital loans based on GST invoices to boost tax compliance and formalisation.)*
- **Providing Targeted Credit Guarantees:** Special attention should be given to vulnerable sectors and regions that struggle with credit access. *(Example: Extending credit guarantees to sectors like salons, tour agencies, and rural MSMEs to ensure financial support in crises.)*
- **Strengthening SIDBI's Role:** The Committee recommended injecting ₹5,000-10,000 crore into SIDBI to strengthen its equity base, allowing it to finance NBFCs and lower borrowing costs. *(Example: SIDBI's Udyam Assist Platform to facilitate MSME registration and financial linkages.)*

- **Launching a Vyapar Credit Card Scheme:** Similar to the Kisan Credit Card, Vyapar Credit Cards should be introduced to provide MSMEs with short-term loans at lower interest rates for working capital needs. *(Example: Enabling small businesses to access credit conveniently for daily operations.)*
- **Implementing System-wide KYC Reform:** The Committee recommended moving from per-transaction KYC to a system-wide KYC framework for smoother credit processing. *(Example: Encouraging financial institutions to adopt account aggregator standards for seamless identity verification.)*

Conclusion:

The MSME sector is a vital pillar of India's economy, contributing significantly to employment, GDP, and exports. Strengthening **formalization, promoting green practices, and enhancing market access can propel MSMEs to new heights.** Targeted policy interventions and structural reforms will be crucial in unlocking the sector's full potential. Ultimately, a resilient MSME ecosystem is **key to India's long-term economic development and global competitiveness.**



Reducing Industrial Emissions in India

This editorial is based on "[The saga of regulating India's thermal power emissions](#)" which was published in The Hindu on 07/02/2025. The article brings into picture the repeated delays in India's thermal power sector's compliance with SO₂ emission norms, with the latest extension pushing it to 2027. This highlights governance challenges where economic priorities often overshadow environmental and public health concerns.

Tag: GS Paper - 3, Conservation, Renewable Energy, Government Policies & Interventions, Achievements of Indians in Science & Technology

India's thermal power sector, a major contributor to air pollution, has long grappled with delays in enforcing **emission** norms, with the **latest extension** for SO₂ compliance pushing deadlines to December 2027.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



However, beyond thermal power, industries such as **steel, cement, and transportation** also contribute significantly to emissions, exacerbating air quality concerns and climate challenges. As India pursues **economic growth, balancing industrial expansion with environmental responsibility is imperative**. Strengthening regulatory enforcement, accelerating cleaner technologies, and adopting a comprehensive emissions reduction strategy across sectors will be crucial in achieving sustainable development while safeguarding public health.

What are the Major Emission-Intensive Industries in India?

- **Power Generation (Thermal Power Plants):** India's power sector is the largest contributor to greenhouse gas (GHG) emissions, primarily due to **coal-based thermal plants**, which contributes around **50% of the country's fuel-related CO₂ emissions**.
 - Delay in implementing **Flue Gas Desulphurisation (FGD) technology** and frequent extensions in SO₂ emission norms further exacerbate pollution.
 - Additionally, inefficiencies in old power plants and high transmission losses lead to unnecessary emissions.
- **Iron and Steel Industry:** The steel sector is highly energy-intensive, contributing significantly to **CO₂ emissions and particulate matter pollution**.
 - Most Indian steel production relies on **coal-based blast furnaces** rather than cleaner electric arc furnaces, increasing emissions.
 - The transition to **green hydrogen-based steelmaking** is slow due to high costs and limited hydrogen infrastructure.
 - India is the **second-largest crude steel producer, emitting 242 Mt CO₂ in 2022**. The Steel Scrap Recycling Policy (2021) aims to reduce emissions, but significant gaps persist.
- **Cement Industry:** Cement manufacturing is a 'hard-to-abate' sector due to its reliance on **limestone calcination, which directly emits CO₂**.
 - The construction sector is a major emitter due to **cement and brick production**, along with diesel-powered machinery
 - Efforts to use **blended cement (fly ash, slag)** and alternative fuels have helped reduce emissions, but adoption remains limited due to economic constraints.
 - Cement production is responsible for 7-8% of current global CO₂ emissions, and approximately **5.8% of CO₂ emissions in India (2022)**.
- **Oil and Gas Industry (Refineries & Petrochemicals):** Refineries and petrochemical plants are major sources of **methane leaks, CO₂, and volatile organic compounds (VOCs)**.
 - India's push for **strategic petroleum reserves** and increased refining capacity has amplified emissions.
 - Oil demand in India is projected to register a 2x growth to reach **11 million barrels per day by 2045**, further exacerbating emissions issues.
 - While **biofuels and compressed biogas (CBG)** projects under the **SATAT scheme** aim to reduce dependency on crude oil, progress remains slow.
- **Fertilizer Industry:** The fertilizer sector is a major emitter of **nitrous oxide (N₂O), a potent greenhouse gas 300 times stronger than CO₂**.
 - Excessive use of **urea-based fertilizers** not only depletes soil health but also contributes to emissions from **ammonia synthesis**, which relies on fossil fuels.
 - Though the government has introduced **nano-urea to reduce usage**, large-scale adoption is slow.
 - India's fertilizer sector **emits approximately 0.58 tonnes of CO₂ per tonne of fertilizer produced**, contributing to a total emissions footprint of around 25 million tonnes of CO₂ in 2022-23.
- **Aluminum and Non-Ferrous Metal Industry:** Aluminum production is one of the most energy-intensive industrial processes due to its dependence on **electricity and carbon anodes**, leading to high CO₂ emissions.
 - The Indian aluminium industry emits **20.88 tonnes of CO₂ per tonne of aluminium**

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course

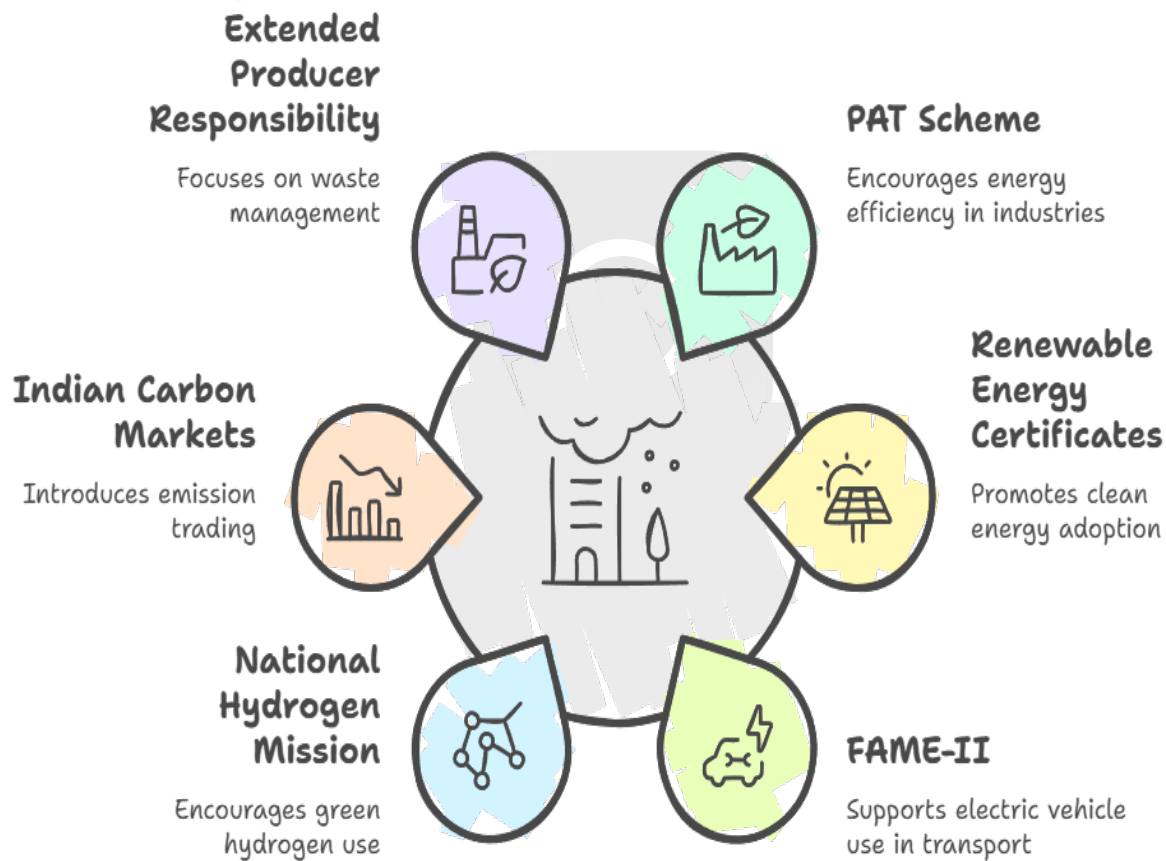


Drishti
Learning
App



- India's large **bauxite reserves** have fueled domestic production, but most smelters still rely on coal-based power.
 - Though recycling aluminum could cut emissions, **India's scrap recycling** infrastructure is underdeveloped.
- Global demand for **green aluminum** is rising, but Indian producers lag in adopting clean energy sources.
- **Transport & Automotive Industry:** The transport sector's emissions are rapidly increasing due to the **rise in vehicle ownership, freight movement, and aviation growth**.
 - The **expansion of highways** and increased SUV sales have further intensified fossil fuel dependency.
 - According to **NITI Aayog**, the transport sector of India is the **third most greenhouse gas (GHG) emitting sector** and **Road transport** presently accounts for **12% of India's energy-related CO2 emissions** and is a key contributor to urban air pollution.

Key Policies for Emission Reduction in India



What are the Key Barriers to Industrial Emission Reduction in India?

- **Dependence on Coal-Based Energy:** India's industrial sector remains heavily reliant on **coal for electricity and process heat**, making emission reduction challenging.
 - Many industries, such as **steel, cement, and aluminum**, require high-temperature processes where coal remains the cheapest and most accessible option.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- In November 2024, the government approved **36 new coal projects** to meet rising energy demands, underscoring continued reliance on coal.
- **High Cost of Clean Technologies:** The adoption of **carbon capture, green hydrogen, and energy-efficient processes** is slow due to high capital investment.
 - For instance, **Green hydrogen** costs ₹350-400/kg, making it unviable for large-scale industrial use.
 - Many industries, especially MSMEs, find the upfront costs prohibitive despite long-term energy savings.
 - Technologies such as **Flue Gas Desulphurisation (FGD) in thermal power plants** and **electrification in steel production** remain underutilized due to financial constraints.
 - Also, while India has expanded its renewable energy capacity, **grid integration issues, transmission bottlenecks**, and lack of industrial-scale storage hinder adoption.
- **Weak Regulatory Enforcement and Frequent Policy Dilutions:** Emission norms for industries often face **deadline extensions, dilution, or inconsistent implementation**.
 - **Industries take advantage of the regulatory loopholes** and delays in compliance checks to avoid investing in cleaner technologies.
 - Pollution control boards often lack the capacity and resources to **strictly monitor and penalize violations**, leading to unchecked emissions.
 - For instance, **SO₂ emission compliance deadline extended to 2027, delaying clean air benefits**.
- **Lack of Financial Incentives for Decarbonization:** While India has launched initiatives like **PAT (Perform, Achieve, and Trade)** and **carbon trading markets**, industries often lack sufficient financial support.
 - Green financing options are limited, and banks are reluctant to lend due to **uncertainty in returns from clean investments**.
 - **Carbon credit pricing remains low**, offering minimal incentive for emission reductions.
 - India's carbon credit market price is ₹300-600 per tonne, too low to drive significant change.
- **Inefficiencies in Industrial Processes:** Many Indian industries still operate with **outdated, inefficient machinery**, increasing their energy consumption and emissions.
 - The majority of thermal power plants in India were set up **during the late 1990s** and have been facing the problems of declining efficiency.
 - **Retrofitting older plants is expensive**, and industries often prioritize production output over efficiency improvements.
 - **Waste heat recovery, cogeneration, and low-carbon manufacturing techniques** remain underutilized due to lack of awareness and technical expertise.
- **Slow Progress in Circular Economy & Waste Management:** Industrial waste recycling and reuse remain **underdeveloped**, increasing raw material demand and emissions.
 - Many industries fail to adopt **circular economy principles**, leading to excessive resource extraction and waste generation.
 - For instance, India generates approximately 4.43 million tons of hazardous waste annually, with only 71,833 tons classified as incinerable (**suitable for disposal by burning**).
 - Also, **Only 21%** of India's steel is made from scrap.
- **Socioeconomic Trade-Offs in Industrial Decarbonization:** Balancing **economic growth, job creation, and emission reduction** poses a significant challenge.
 - Many emission-intensive industries are major **employment generators**, making strict regulations politically sensitive.
 - Without a **just transition framework**, the shift to cleaner industries may face strong resistance from workers and businesses.
 - In terms of jobs, the study estimates that **3.6 million people are either directly or indirectly employed in the coal mining and power sectors**, making transition difficult.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



What are the Global Best Practises for Emission Reduction and Sustainability?

- **Renewable Energy Transition:** Wind power generated nearly **60% of Denmark's electricity**.
 - **Germany's *Energiewende* policy** has led to extensive adoption of solar and wind power.
- **Carbon Pricing & Taxes:** Switzerland and Liechtenstein currently levy the highest carbon tax rate at **\$130.81 per ton of carbon emissions**
 - Canada has implemented a federal carbon pricing system covering multiple industries.
 - The **European Union's Emissions Trading System (ETS)** follows a cap-and-trade model to regulate carbon emissions.
- **Sustainable Transport:** **Norway** has the **highest electric vehicle penetration**, with more than 80% of new cars being electric.
 - China runs **world's largest EV charging network**, with 1.8 million public charging stations
- **Energy Efficiency & Green Buildings:** Japan's **Top Runner Program** sets efficiency standards for appliances.
 - **Singapore's Green Building Masterplan** aims for net-zero emissions.
- **Afforestation & Carbon Sinks:** Costa Rica has restored **over 50% of its forest cover through a Payment for Ecosystem Services (PES) program**.
 - **China** leads the world's largest afforestation initiative with the **Great Green Wall**.

What Measures can India Implement to Reduce Industrial Emissions and Accelerate Energy Transition?

- **Strengthening Carbon Pricing and Emission Trading:** India should implement a **mandatory carbon pricing mechanism** with stringent **cap-and-trade regulations** to make emissions reduction financially viable.
 - Expanding the **Carbon Credit Trading Scheme** to cover more industries and integrating it with global markets will increase its effectiveness.
 - Higher carbon pricing will push industries towards **cleaner fuels, energy efficiency, and carbon capture adoption**.
- The government must also impose **strict penalties for non-compliance** to deter industries from paying low fines instead of cutting emissions.
- **Expanding Green Hydrogen and Biofuel Ecosystem:** Scaling up **green hydrogen production** through policy incentives and public-private partnerships can help decarbonize **steel, cement, and fertilizer sectors**.
 - Simultaneously, boosting **biofuels and compressed biogas (CBG) under the SATAT scheme** will reduce reliance on fossil fuels in the **transport and refining sectors**.
 - These clean alternatives must be backed by **low-cost financing** to encourage industries to make the switch.
- **Faster Adoption of Circular Economy in Manufacturing:** India must enforce strict **Extended Producer Responsibility (EPR)** for industries like **steel, cement, textiles, and e-waste**, mandating a shift to **recycled and secondary raw materials**.
 - Promoting **industrial symbiosis**—where waste from one industry serves as raw material for another—can significantly cut emissions.
 - **Mandatory material recovery targets** should be set under sustainability frameworks like **ZED (Zero Defect, Zero Effect) Certification** to encourage cleaner production.
 - Additionally, creating **recycled material marketplaces** can improve supply chain efficiency and lower raw material demand.
- **Decarbonizing Thermal Power Plants through Rapid FGD and CCS Deployment:** India must enforce the long-delayed **Flue Gas Desulphurisation (FGD)** installation in coal-fired power plants while **accelerating Carbon Capture and Storage (CCS) deployment**.
 - Setting up **carbon utilization hubs** where captured CO₂ is repurposed for chemicals, synthetic fuels, and construction materials can enhance economic feasibility.
 - Retrofitting old coal plants with **supercritical technology** will improve efficiency and reduce emissions per unit of power generated.
 - In parallel, a gradual shift towards **coal gasification and hybrid power models (coal + renewables)** should be incentivized.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Strengthening Industrial Energy Efficiency Standards:** Expanding the **Perform, Achieve, and Trade (PAT) Scheme** to cover more energy-intensive industries with **sector-specific efficiency benchmarks** will ensure targeted improvements.
 - Making **Energy Conservation Building Code (ECBC) compliance mandatory for factories** will promote the adoption of **waste heat recovery, cogeneration, and smart grid solutions**.
 - MSMEs should receive subsidized access to **energy-efficient machinery** and digital monitoring tools under schemes like **Technology Upgradation Fund (TUF)** to drive emissions reduction at scale.
- **Accelerating Renewable Energy Adoption in Industries:** Industries must be incentivized to **shift to captive solar, wind, and hybrid renewable power solutions** to reduce dependence on fossil-fuel-based electricity.
 - Expanding **Open Access Renewable Energy Policies** will allow industries to buy power directly from **green energy suppliers** at lower tariffs.
 - Faster **battery storage deployment** through viability gap funding will improve renewable power reliability for industrial use.
- **Developing Low-Carbon Transport and Green Logistics:** To decarbonize freight transport, industries must transition to **electric and hydrogen-powered trucks**, supported by an **EV battery swapping ecosystem**.
 - Enhancing the **Dedicated Freight Corridor (DFC)** and promoting **rail-based goods movement** over road transport will cut emissions significantly.
 - Expanding **green shipping initiatives** in major ports and mandating **zero-emission warehouses** will further reduce supply chain emissions.
 - **Linking rail electrification with industrial transport policies** can ensure a synchronized transition to cleaner logistics.
- **Ensuring Just Transition for Coal-Dependent Industries:** While moving towards low-carbon alternatives, India must implement a **Just Transition framework** to protect workers and communities reliant on **coal mining, thermal power, and energy-intensive industries**.
 - A national **Reskilling and Green Jobs Program** can train workers in **solar panel manufacturing, hydrogen fuel cell technology, and EV component production**.

- Industrial zones should be **repurposed into clean energy and sustainable manufacturing hubs**, ensuring no region is left behind in the energy transition.
- **Strengthening Waste-to-Energy and Industrial Waste Management:** Scaling up **waste-to-energy plants, bio-CNG production, and industrial waste valorization** will significantly cut methane and CO₂ emissions.
 - Implementing **zero landfill policies for large industries** will push sectors like **textiles, chemicals, and food processing** to adopt closed-loop production.
 - Incentivizing **biodegradable alternatives and chemical recycling in plastic-heavy industries** will also contribute to lower emissions.
 - Industries should be mandated to use **certified green packaging** to curb waste generation at the source.

Conclusion:

India's industrial sector must **urgently balance economic growth with emission reduction to ensure sustainable development**. Aligning with the **Kyoto Protocol's principle of common but differentiated responsibilities (CBDR)**, India must accelerate its transition while considering its developmental needs. Implementing these measures will also contribute to **SDG 7 (Affordable and Clean Energy)**, **SDG 9 (Industry, Innovation, and Infrastructure)**, and **SDG 13 (Climate Action)**.



Bridging the Gap in Tribal Welfare

*This editorial is based on "**Budget and Adivasis: Is it about development or politics?**" which was published in The Indian Express on 07/05/2024. The article brings into focus the Union Budget 2025-26's unprecedented 46% funding increase for tribal welfare, emphasizing PM JANMAN, DA-JGUA, and Eklavya Schools. However, challenges like unspent funds, resource diversion, and displacement remain critical concerns.*

Tag: GS Paper - 2, Issues Related to SCs & STs, Government Policies & Interventions

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



The **Union Budget 2025-26** has demonstrated unprecedented commitment to **tribal welfare** with a **46% increase in allocation to the Ministry of Tribal Affairs**. The budget prioritizes three key initiatives - **PM JANMAN** for vulnerable tribal groups, **DA-JGUA** for comprehensive development, and **Eklavya Model Residential Schools** for quality education. The increased budget could represent a turning point for India's tribal communities, but significant challenges persist - **from unspent funds and resource diversion to displacement-driven development projects** - that need immediate attention to ensure these allocations translate into real change on the ground for effective tribal welfare.

What is the Significance of Tribal Communities for India?

- **Custodians of India's Biodiversity and Forest Conservation:** Tribals play a crucial role in **preserving forests, wildlife, and biodiversity** through their traditional knowledge and sustainable practices.
 - They act as the first line of defense against **deforestation, illegal mining, and poaching**, ensuring ecological balance.
 - The ISFR 2019 indicates that close to **60%** of the country's forest cover is in tribal districts like **Madhya Pradesh, Chhattisgarh, and Odisha**.
- **Rich Cultural and Linguistic Heritage:** India's tribal communities **preserve diverse languages, art forms, folklore, and indigenous knowledge systems**, enriching national identity.
 - Their traditions, festivals, and handicrafts contribute significantly to tourism and the creative economy.
 - The **GI Tag Registry** shows that **many tribal art forms** like **Gond painting (Madhya Pradesh)** and **Pattachitra (Odisha)** have received Geographical Indication (GI) status, boosting economic potential.
- **Vital for India's Economic and Agricultural Diversity:** Tribals contribute significantly to **agriculture, minor forest produce (MFP) collection, and traditional crafts**, strengthening India's rural economy.
 - They are key producers of **lac, tendu leaves, bamboo, and medicinal herbs**, yet face exploitation in pricing and market access.
 - According to **TRIFED**, tribal people derive **20-40%** of their annual income from Minor Forest Produce.
- **Van Dhan Yojana** has a target of **establishing 50,000 Van Dhan Vikas Kendras** across the country, which will benefit around **10 lakh tribal entrepreneurs**
- **Significant Political Influence in Indian Democracy:** With a population of **over 104 million (Census 2011)**, tribals form a crucial voting bloc, impacting state and national elections.
 - Their role in electoral politics is evident in **tribal-dominated states like Jharkhand, Chhattisgarh, Madhya Pradesh, and Odisha**.
 - Increased tribal representation in governance ensures their socio-economic concerns are addressed effectively.
 - The appointment of **Droupadi Murmu** as India's **first tribal President** reflects growing tribal representation in national leadership.
 - Also, in a historic move, the **Shompen tribe of Great Nicobar** voted for the first time in a **General Election 2024**.
- **Essential for Climate Change Adaptation and Sustainable Development:** Tribals possess deep traditional knowledge of **climate adaptation, water conservation, and sustainable agriculture**, which is crucial in combating climate change.
 - Their **indigenous water-harvesting methods, biodiversity conservation practices, and disaster resilience techniques** offer lessons for modern sustainability strategies.
 - UNESCO has recognised that **Indigenous knowledge systems contribute to the achievement of Sustainable Development Goal 13** on climate action by observing changing climates.
 - For instance, it has been found that **tribal water conservation techniques** like **Zabo farming (Nagaland)** improve groundwater recharge and promote sustainable agriculture.
- **Backbone of India's Traditional Medicine and Ayurveda:** Tribal communities hold **vast knowledge of herbal medicine, Ayurveda, and ethno-botanical practices**, contributing to India's healthcare system.
 - Their use of **medicinal plants and natural remedies** supports alternative medicine, but over-commercialization threatens these resources.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Government initiatives like **AYUSH** and **Tribal Health Mission** must ensure **tribal knowledge protection and fair benefit-sharing**.
- It has been estimated that more than **8,000 species of plants are used by the tribal and ethnic communities** in India as part of their health care.
- **Critical for Sustainable Tourism and Eco-Tourism:** Tribal regions are home to **some of India's most biodiverse landscapes**, making them key players in **sustainable and eco-tourism**.
 - Their **cultural festivals, handicrafts, and traditional cuisines** attract tourists, boosting local economies.
 - Under the **Swadesh Darshan scheme**, **1,000 tribal homestays** are being promoted to enhance local tourism and support livelihoods in tribal regions.

What are the Key Issues Faced by Tribal Communities in India?

- **Land Alienation and Displacement:** Tribal communities face large-scale displacement due to industrial projects, mining, and conservation efforts, leading to loss of traditional livelihoods.
 - The lack of proper implementation of the **Forest Rights Act (FRA), 2006**, results in denial of land titles, further marginalizing them.
 - According to the **Ministry of Tribal Affairs**, only **50% of FRA claims** have been approved, leaving lakhs of tribals landless.
 - Also, sometimes resettlement policies remain inadequate, pushing them into extreme poverty.
 - A 2022 report stated that **hundreds of tribals displaced from Satpura Tiger Reserve in Madhya Pradesh** were not provided rehabilitation and compensation as of June 2022.
- **Poor Health and Malnutrition:** Tribal populations suffer from **higher mortality rates, malnutrition, and lack of healthcare access**, worsened by poor infrastructure in remote areas.
 - The prevalence of **sickle cell anemia, tuberculosis, and malnutrition** is alarmingly high, yet public health interventions remain weak.
 - Sickle Cell Disease is widespread among the tribal population in India where about **1 in 86 births among STs have SCD**.
- Also, a recent report stated that **30.8% of tribal children** under five suffer from undernutrition, leading to stunting and wasting.
- **Lack of Quality Education and EMRS Implementation Gaps:** Tribal students face **language barriers, poor infrastructure, and high dropout rates**, especially in higher education.
 - The **Eklavya Model Residential Schools (EMRS)**, meant to provide quality education, face **delays in construction and lack of teachers**.
 - Also, recent **centralization of the recruitment process for Eklavya Model Residential Schools**, along with the mandatory Hindi proficiency requirement, has raised concerns.
- **Livelihood Crisis and Economic Marginalization:** Traditional tribal occupations such as **shifting cultivation, forest produce collection, and handicrafts** are declining due to **deforestation, legal restrictions, and market exploitation**.
 - MGNREGA and other employment schemes provide some relief, but wages remain low, and corruption reduces actual benefits.
 - Access to credit remains difficult, pushing many into debt traps under informal moneylenders.
 - Recent reports stated that **only 12.3% of people from the scheduled tribes group** had wage employment in 2022-23, highlighting the gravity of the issue.
- **Impact of Climate Change and Environmental Degradation:** Tribal communities, dependent on forests and natural resources, are **disproportionately affected by climate change** and environmental degradation.
 - **Erratic rainfall** has reduced agricultural yields and forest produce availability.
 - Government policies **promoting afforestation and conservation often displace tribals** without ensuring their participation.
- **Loss of Indigenous Culture and Linguistic Marginalization:** Tribal languages and cultural heritage are fast disappearing due to **urbanization, lack of institutional support, and mainstreaming policies**.
 - The **National Education Policy (NEP) 2020** emphasizes mother-tongue education, but tribal languages lack **textbooks, teachers, and policy-level recognition**.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Digital and mass media penetration is further accelerating this cultural dilution.
- **UNESCO** has declared 197 Indian languages as 'endangered'. Various unscripted languages are particularly in danger of becoming extinct
- **Human Rights Violations and Security Issues:** Tribals often become victims of **state-led displacement, police excesses, and Maoist insurgency**, caught between the government and extremist groups.
- Incidents of land grabbing, forced evictions, and violence against tribals remain high, despite constitutional protections. The misuse of laws like UAPA against tribal activists and inadequate legal aid make justice inaccessible. The rise of **private militia and corporate land acquisitions** has further worsened tribal vulnerability.
- According to 2021 NCRB data, crimes against Scheduled Tribe (ST) communities rose by **9.3%**.

What are the Indian Government Initiatives for Tribal Welfare and Development?

- **Forest Rights Act (FRA), 2006:** Grants **individual and community forest rights** to tribals, empowering them to manage land and resources.
- **Panchayats (Extension to Scheduled Areas) Act (PESA), 1996:** Strengthens **self-governance** in tribal areas by giving **Gram Sabhas decision-making powers** over land and resources.
- **Eklavya Model Residential Schools (EMRS):** Provides **quality education** for tribal children in remote areas, with **740 schools sanctioned**.
- **Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN):** Focuses on **health, education, and livelihoods** for Particularly Vulnerable Tribal Groups (PVTGs).
- **Van Dhan Vikas Yojana (VDVY):** Promotes **value addition and marketing** of Minor Forest Produce (MFP).
- **Minimum Support Price (MSP) for Minor Forest Produce (MFP) –** Ensures **fair prices** for tribals collecting forest produce.
- **Tribal Health and Nutrition Portal – 'Swasthya' –** A digital platform tracking **tribal health indicators**.

What Measures can India Adopt to Enhance Tribal Welfare and Development?

- **Effective Implementation of the Forest Rights Act (FRA), 2006:** Ensuring timely recognition of **Individual and Community Forest Rights (IFR & CFR)** will empower tribals to manage their land and natural resources.
 - **Digitizing land records (as envisioned in Budget 2025-25)**, setting up **fast-track FRA tribunals**, and involving local Gram Sabhas in claim verification can speed up the process.
 - Strengthening the link between **FRA and MGNREGA** can provide sustainable employment in afforestation and conservation.
- **Expanding and Strengthening Eklavya Model Residential Schools (EMRS):** While the **₹7,088 crore budget allocation for EMRS (2025-26)** is a welcome move, ensuring infrastructure, quality teachers, and modern pedagogy is crucial.
 - Introducing **tribal-language textbooks, digital learning platforms, and vocational training** can improve educational outcomes.
 - Linking **EMRS with PM Daksh Yojana** will ensure skill-based training alongside academic education.
- **Revamping Tribal Healthcare through Mobile Health Units and AYUSH Integration:** Tribal regions suffer from **high malnutrition, maternal mortality, and endemic diseases**, requiring **decentralized healthcare solutions**.
 - Deploying **mobile health clinics with telemedicine** in remote areas can bridge healthcare gaps.
 - Strengthening the **National Health Mission (NHM) and Poshan Abhiyan** in tribal belts can improve child and maternal health indicators.
- **Ensuring Sustainable Livelihoods through Minimum Support Price (MSP) for Minor Forest Produce (MFP):** Tribal livelihoods depend on **minor forest produce (MFP) like tendu leaves, mahua, and honey**, yet market exploitation leads to distress sales.
 - Expanding MSP coverage for more MFPs and strengthening **Van Dhan Vikas Kendras (VDVKs)** can enhance tribal incomes.
 - Encouraging **community-led forest produce cooperatives** will ensure fair pricing and reduce dependence on middlemen.
 - Integrating **PM Vishwakarma Yojana** with VDVKs can further promote value addition and tribal entrepreneurship.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Empowering Tribal Women through SHGs and Microfinance:** Tribal women face **economic marginalization and social exclusion**, requiring targeted financial inclusion policies.
 - Strengthening **Self-Help Groups (SHGs)** under the **National Rural Livelihoods Mission (NRLM)** will improve their access to credit and entrepreneurship opportunities.
 - Providing **interest-free loans, financial literacy programs, and digital banking access** will empower tribal women economically.
 - Linking SHGs with **One District One Product (ODOP) initiative** can ensure market access for tribal handicrafts.
- **Boosting Political Representation and Tribal Governance:** Despite reserved seats, tribal voices are **underrepresented in higher decision-making bodies**, impacting policy execution.
 - Strengthening **PESA (Panchayats Extension to Scheduled Areas) Act, 1996**, will empower Gram Sabhas in decision-making.
 - Decentralizing development planning by ensuring **direct tribal participation in budget allocations** will improve governance efficiency.
 - Implementing **capacity-building programs** for tribal leaders can enhance their political agency.
- **Addressing Land Displacement and Rehabilitation Challenges:** Tribal displacement due to **mining, dam projects, and conservation** leads to landlessness and socio-economic instability.
 - Strict implementation of the **Right to Fair Compensation and Transparency in Land Acquisition Act, 2013**, is needed to prevent forced evictions.
 - Setting up **land banks for displaced tribals**, offering alternative livelihoods, and ensuring proper rehabilitation can mitigate displacement effects.
- **Developing Tribal Tourism for Economic Growth:** Eco-tourism and cultural tourism in tribal areas can generate **sustainable employment** and **preserve tribal heritage**.
 - Developing **community-owned tribal tourism enterprises** will ensure direct benefits to tribals rather than private operators.
 - Promoting **homestays, handicraft hubs, and guided eco-tours** can boost income while ensuring cultural sustainability. Integrating **Swadesh Darshan Scheme with Tribal Tourism Circuits** will promote responsible tourism.
- **Decentralized Renewable Energy Microgrids for Tribal Villages:** Many tribal regions remain **off-grid or experience unreliable electricity**, affecting education, healthcare, and livelihoods.
 - Setting up **community-owned solar, wind, or biomass microgrids** can provide clean energy while reducing dependence on external suppliers.
 - Training tribals in **solar panel maintenance, biogas generation, and battery storage** will create local employment. These microgrids can also power **cold storage for perishable farm produce**, improving food security.
- **Developing Tribal Superfoods for Global and Domestic Markets:** Tribal regions are home to **nutrient-rich superfoods like millets, wild honey, bamboo rice, and moringa**, which have high global demand.
 - Creating **geographical indication (GI) certification** for tribal superfoods can ensure premium pricing and market access.
 - Establishing **farm-to-table tribal collectives** will eliminate middlemen and increase direct profits.
 - Linking these products with **e-commerce platforms like ONDC and organic food brands** can boost the tribal economy while promoting **nutritional security**.

Conclusion:

India's **enhanced budgetary** focus on tribal welfare marks a pivotal step toward inclusive development. However, challenges like **land displacement, poor healthcare, and educational deficits** persist. Bridging these gaps through effective implementation and community-driven initiatives is crucial. Only then can true **empowerment and equitable growth for tribal communities** be realized.



Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



India's Middle East Strategy

This editorial is based on “[Middle East crisis must not undermine India-Middle East Economic Corridor: Greek Foreign Minister](#)” which was published in The Hindu on 05/02/2025. The article highlights IMEC's strategic importance, reflecting India's rising influence in West Asia. While the Israel-Gaza conflict has delayed progress, the corridor remains vital to India's economic and diplomatic goals.

Tag: GS Paper - 2, Bilateral Groupings & Agreements, Groupings & Agreements Involving India and/or Affecting India's Interests, Effect of Policies & Politics of Countries on India's Interests, International Treaties & Agreements

The [India-Middle East-Europe Economic Corridor \(IMEC\)](#), launched at the [G-20 Summit 2023](#) highlights India's expanding strategic influence in **West Asia**. Despite strong backing from partners like **Greece**, which sees it as a “**project for peace**,” the initiative has hit **roadblocks due to the ongoing Israel-Gaza conflict**. At its core, IMEC represents more than just a trade route – it embodies India's ambition to forge deeper economic and diplomatic ties across the Middle East while establishing itself as a **key player in reshaping global supply chains**.



Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



Why is the Middle East Crucial to India's Foreign Outlook?

- **Energy Security and Economic Stability:** India's crude oil imports from the **Middle East** rose from **51% (December 2024)** to **53.89% in January 2025**, making it indispensable for sustaining economic growth.
 - In **January 2023**, India and the UAE signed an MoU to collaborate on green hydrogen development and an undersea cable under the '**One Sun, One World, One Grid**' initiative.
 - In February 2024, India extended its **LNG deal with Qatar until 2048** for 7.5 million tonnes per annum, ensuring long-term energy stability.
- **Trade, Investment, and Economic Corridors:** During FY 2023-24, India-GCC bilateral trade stood at USD 161.59 billion, with the Middle East being a key partner.
 - India's strategic economic engagement, including **Free Trade Agreements (FTAs)** and economic corridors, aims to enhance connectivity and market access.
 - The **India-Middle East-Europe Economic Corridor (IMEC)** will strengthen supply chains and reduce trade costs.
 - The **UAE ranks as India's third-largest trading partner** and second largest export destination, with exports over US\$ 35.62 billion in FY 2023-24.
- **Remittances and Workforce Contributions:** The Middle East hosts over **millions** Indian expatriates, whose remittances significantly contribute to India's forex reserves and economic stability.
 - More than **66% of India's 1.34 crore Non-Resident Indians (NRIs)** live in the **United Arab Emirates, Saudi Arabia, Kuwait, Qatar, Oman and Bahrain**.
 - **Saudi Arabia's Nitaqat reforms** are reshaping labor policies, prompting India to negotiate favorable migration policies.
 - India received **\$111 billion** in remittances in **2022**, the largest in the world, with a major share coming from the Gulf region.
- **Geopolitical and Strategic Cooperation:** Amid rising regional tensions, India's balanced diplomacy between rival blocs, including **Saudi Arabia-Iran and Israel-Arab nations**, **secures strategic autonomy**.
 - Defense ties are expanding, with India engaging in joint military exercises and securing defense exports.
 - For instance in 2021, India and Saudi Arabia **started their first-ever Naval joint exercise** called the **Al-Mohed Al-Hindi Exercise**.
 - The **India-Iran Chabahar Port Agreement** enhances connectivity with Central Asia, bypassing Pakistan.
- **Food and Maritime Security: India depends on the Middle East for food exports**, with Gulf countries being top buyers of **Indian rice, wheat, and eggs**.
 - For instance, in **FY 2022-23**, the **UAE became India's second-largest importer** of agricultural products, accounting for \$1.9 billion (**6.9% of India's total agricultural exports**).
 - Also, India exports rice, textile, garments, machinery, cereals, automobiles and gems and jewelry to Saudi Arabia.
- **Cultural, Religious, and Soft Power Diplomacy:** India's historical ties with the Middle East, rooted in shared heritage, Sufi traditions, and diaspora, foster strong diplomatic relations.
 - The region's religious significance for millions of **Indian Muslims (Hajj, Umrah)** deepens bilateral engagement.
 - **Bollywood, yoga, and Ayurveda** enhance India's cultural outreach in Gulf nations.
 - Also, the recently built **BAPS Temple in the UAE**, constructed with pink sandstone from Rajasthan, stands as a cornerstone of India-UAE cultural ties.

What are the Key Issues in India-Middle East Relations?

- **Energy Price Volatility and Supply Disruptions:** India's heavy reliance on Middle Eastern oil and gas makes it vulnerable to price fluctuations and geopolitical crises.

Prepare with Drishti IAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Rising tensions, such as the **Houthi attacks in the Red Sea (2023-24)** and **OPEC+ production cuts**, disrupt supply chains and increase import costs.
 - Additionally, India's push for energy diversification, including Russian oil imports, **sometimes strains traditional energy partnerships**.
- For instance, several OPEC+ nations voluntarily agreed to reduce oil production by **2.2 million barrels per day in Q1 2024**, raising global oil prices, impacting India's energy costs.
- **Geopolitical Instability and Regional Conflicts:** Persistent conflicts in **Israel-Palestine, Yemen, and Iran-Saudi Arabia tensions** create diplomatic challenges for India.
 - Balancing relations between **Iran and Saudi Arabia** while maintaining neutrality in the **Israel-Gaza conflict** is crucial.
 - Disruptions in West Asia impact Indian trade, diaspora (**Operation Ajay** was launched by India to evacuate **18,000 Indians from Israel**), and **energy security**, forcing India into complex diplomatic maneuvering.
 - The **IMEC project launch** has been delayed due to the **Israel-Gaza Conflict**, affecting regional trade plans. Though, **the conflict has seen ceasefires**, tensions and issues continue to persist.
- **Trade Barriers and Delayed Economic Agreements:** Despite strong trade ties, the absence of a **Free Trade Agreement (FTA) with the GCC** limits full economic potential.
 - Regulatory issues, tariff barriers, and labor laws hinder business expansion.
 - While CEPA with the **UAE (2022)** boosted bilateral trade, **negotiations for an India-GCC FTA have seen slow progress** due to regional complexities.
 - Also, the IMF has reported that economies in the **Middle East, North Africa, Caucasus, and Central Asia** face shifting trade patterns with deteriorating growth prospects over two decades.
- These challenges could **hinder India's efforts to enhance trade with Middle eastern countries**.
- **Maritime Security and Threats to Trade Routes:** The **Red Sea, Persian Gulf, and Arabian Sea** are vital for India's trade, yet they face rising security threats from **piracy, and geopolitical conflicts**.
 - Attacks on commercial vessels increase shipping costs, delay cargo movement, and threaten India's **Sea Lines of Communication (SLOCs)**.
 - India's navy has intensified patrols, but instability persists.
 - **Houthi attacks (2023-24) in the Red Sea** forced many shipping companies to reroute. It disrupted Indian trade as well, impacting crude oil imports (**65% via Suez Canal**),
 - **Rising shipping costs (40-60%), delays (up to 20 days), and higher insurance premiums (15-20%)** posed major challenges.
- **Labor Rights and Migration Issues:** India's **workforce** in the Middle East faces issues like **job losses, wage delays, and labor exploitation**.
 - While Gulf countries are reforming labor laws (e.g., **Saudi Nitaqat policy**) challenges persist.
 - India is negotiating new migration frameworks to ensure job security and workers' rights, **but illegal migration remains a concern**.
 - In 2024, the tragic deaths of **46 Indian migrant workers in a Kuwait fire** rekindled safety concerns over their living conditions.
- **Strategic Rivalries and External Influence:** China's growing footprint in the Middle East, through **Belt and Road Initiative (BRI) investments** and **defense ties**, poses a challenge to India's influence.
 - In **March 2023**, Iran and Saudi Arabia, **with China's mediation**, agreed to restore diplomatic ties, showcased China's diplomatic clout, raising concerns for India's regional engagement.
 - Also, between the years **2005 and 2022**, China made investments exceeding **\$273 billion in the Middle East**.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



What Role do Infrastructure Projects Play in Shaping India's Foreign Policy Outlook?

- **Strengthening Regional Connectivity and Trade Expansion:** India's infrastructure projects play a crucial role in enhancing trade routes and integrating with global markets.
 - Initiatives like the **India-Middle East-Europe Economic Corridor (IMEC)** and **Chabahar Port** strengthen India's supply chain resilience and reduce dependence on traditional trade routes.
- **Geopolitical Leverage and Strategic Influence:** Investing in infrastructure abroad helps India expand its geopolitical influence and balance regional power dynamics.
 - Through projects like the **Kaladan Multi-Modal Transit Transport Project (Myanmar)** and **Trilateral Highway (India-Myanmar-Thailand)**, India strengthens its presence in Southeast Asia.
 - India's investment in **Africa's digital and physical infrastructure (AAGC)** counters China's **BRI investments in Africa**.
- **Securing Energy and Maritime Interests:** Infrastructure projects in the energy sector ensure long-term security and diversification of supply sources.
 - Projects like the **TAPI (Turkmenistan-Afghanistan-Pakistan-India) gas pipeline** and investments in Middle Eastern ports strengthen India's energy security.
 - With **Assumption Island in Seychelles** and **Agalega in Mauritius** under development, **Duqm in Oman** aligns with India's proactive maritime security strategy.
- **Enhancing Soft Power and Development Partnerships:** India's foreign infrastructure projects also serve as tools of soft power by promoting sustainable and inclusive development.
 - Through initiatives like the **International Solar Alliance (ISA)** and investments in **water and sanitation projects in Africa**, India builds goodwill and long-term diplomatic trust.
 - These projects strengthen India's global standing as a responsible development partner

What Measures India Can Adopt to Enhance Its Relations with the Middle East?

- **Strengthening Energy Partnerships through Co-Development:** India should shift from being a passive energy importer to an active **co-investor in energy infrastructure** across the Middle East.
 - Joint ventures in **renewable energy, hydrogen production, and oil refining** will create long-term interdependence and reduce price volatility risks.
 - Partnering on **strategic oil reserves and LNG infrastructure** will also ensure stable supply chains for both sides.
 - **Saudi Aramco's stake in India's \$44 billion Ratnagiri refinery** (delayed but viable) could **secure long-term energy ties**.
- **Expanding Trade and Economic Integration Beyond Oil:** Diversifying trade beyond hydrocarbons by promoting **manufacturing, IT, space technology, and defense exports** will create a deeper economic link.
 - Finalizing **India-GCC FTA** will accelerate investment flows and reduce trade barriers.
 - **Strengthening the IMEC corridor's implementation** will make India a critical part of the global supply chain.
 - The **IMEC corridor, announced at G20 (2023)**, must be fast-tracked despite delays from the Israel-Gaza conflict.
- **Co-Development in Defense and Security Cooperation:** India should deepen **joint defense production** rather than just selling arms, making Gulf countries co-developers.
 - Establishing **defense technology parks in the UAE and Saudi Arabia** will integrate supply chains, reducing dependency on Western defense manufacturers.
 - Strengthening **intelligence sharing and anti-terror frameworks** will also enhance security cooperation.
- **Strengthening Investment in Digital and Technology Sectors:** Encouraging Middle Eastern sovereign funds (such as **Saudi PIF, UAE ADIA, and Qatar Investment Authority**) to co-invest in India's **AI, fintech, digital infrastructure, and smart cities** will create mutual economic interdependence.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- India can also position itself as a **technology partner** by offering **IT, cybersecurity, and space tech collaborations**.
- **Enhancing Food and Water Security through Agri-Tech Cooperation:** India can **co-develop agricultural tech parks in the Middle East**, ensuring food security while boosting Indian agri-tech exports.
 - Collaborations in **desalination, hydroponics, and smart irrigation** will make Gulf countries less dependent on food imports while giving Indian firms a stake in local production.
 - The **India-Middle East Food Corridor** represents a pivotal alliance between India and the UAE, driven by the shared goal of ensuring food security. It can be expanded for joint research and innovation in water conservation.
- **Institutionalizing Migration Frameworks:** Rather than just sending low-skilled workers, India should **collaborate on upskilling and creating labor mobility agreements** for high-skilled sectors like healthcare, engineering, and AI.
 - Jointly establishing **vocational training centers** in Gulf countries will improve wages, working conditions, and mutual economic benefits.
 - Also, the **Pravasi Bharatiya Bima Yojana (PBBY)**, a mandatory insurance scheme for **ECR-category Indian migrants**, has the potential to be expanded and made more inclusive.
- **Strengthening Maritime and Logistics Infrastructure:** India should **co-develop port infrastructure and logistics hubs** in the Middle East to strengthen maritime trade and supply chain connectivity.
 - Expanding **port investments in Saudi Arabia, Oman, and Greece** will make India a **logistics hub for IMEC** and beyond.
 - **Adani Ports, exploring investments in Greek ports (2024)** to expand India's trade footprint in Europe, is a significant step.
- **Strengthening Counter-Terrorism Through Beyond Borders Principle:** India should **enhance counter-terrorism collaboration with Middle Eastern nations** by institutionalizing intelligence-sharing mechanisms, joint counter-terrorism exercises, and cyber-surveillance networks.

- Establishing a **regional counter-terrorism center with Gulf nations** can improve real-time threat assessment and crisis response.
 - **Inclusion of Middle Eastern States in SCO as dialogue partners** opens a window for India to collaborate through **Regional Anti-Terrorist Structure**.
- Cooperation on tracking terror financing through joint financial intelligence units will strengthen security frameworks.

Conclusion:

India's engagement with the Middle East is **no longer just about energy imports**—it has evolved into a **multi-dimensional partnership encompassing trade, strategic connectivity, defense collaboration, and cultural diplomacy**. To maximize its potential, India must accelerate infrastructure development, finalize trade agreements, and deepen security cooperation while maintaining its strategic autonomy.



Harnessing AI for Governance

*This editorial is based on “**Paris AI Action Summit: India should take the lead for the Global South**” which was published in The Indian Express on 11/02/2025. The article brings into picture the Paris AI Action Summit 2025, where India and France lead global efforts on AI governance. With its Digital Public Infrastructure and STEM expertise, India is poised to bridge AI divides and advocate balanced, inclusive regulation.*

Tag: GS Paper - 3, Robotics, Artificial Intelligence, Scientific Innovations & Discoveries, IT & Computers, GS Paper - 2, Government Policies & Interventions

The **Paris AI Action Summit, 2025** co-chaired by India and France, marks a pivotal moment in **global AI governance**, bringing together over **90 nations** to address critical challenges from digital divide to AI safety. **India's Digital Public Infrastructure** and STEM expertise position it to bridge the West's tech ambitions and the Global South's needs. As AI regulation gains momentum, India can champion a balanced approach, blending **innovation with pragmatic oversight** while leading AI safety for developing nations.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



What are the Key Applications of AI in Governance?

- **Enhancing Policy Formulation and Assist Decision-Making:** AI enables data-driven policymaking by **analyzing vast datasets to predict economic trends, assess social challenges, and optimize resource allocation.**
 - Governments can **use AI to simulate policy impacts before implementation**, ensuring informed decision-making.
 - For instance, in **April 2018**, **NITI Aayog** selected an **AI tool from IIT Delhi** which reveals and predicts socio-economic conditions of areas using satellite images.
 - The Indian government's **Bhashini project enhances multilingual communication**, aiding policy outreach to diverse linguistic groups.
- **Strengthening Public Service Delivery and Efficiency:** AI-driven automation reduces **bureaucratic delays, minimizes human errors**, and ensures faster service delivery in governance.
 - Chatbots and virtual assistants streamline grievance redressal, while AI-based systems optimize welfare scheme disbursement.
 - For example, the **India Urban Data Exchange (IUDX)**, an initiative by the Ministry of Housing and Urban Affairs, serves as a data exchange platform for Indian cities.
 - Developed under the **Smart Cities Mission and implemented by IISc Bengaluru**, it enables seamless data sharing among urban stakeholders, enhancing governance and service delivery.
- **Improving Law Enforcement and Internal Security:** AI strengthens law enforcement by enabling **predictive policing, real-time crime mapping, and facial recognition-based surveillance.**
 - AI-based analytics help security agencies detect cyber threats, track terrorist activities, and prevent financial fraud.
 - For instance, **Delhi Police's AI-driven Facial Recognition System (FRS)** is assisting police in not only solving crimes, but also in locating missing children and identifying bodies
- **Revolutionizing Healthcare and Pandemic Management:** AI-driven diagnostics, robotic surgeries, and **predictive analytics improve healthcare accessibility and outcomes.**
 - AI-enabled disease surveillance **helps in early detection of outbreaks, allowing rapid government response.**
 - For example, **Niramai, a Bangalore-based start-up**, is using Machine Learning to detect **breast cancer at an early stage**. Another start-up, **ChironX**, employs deep learning algorithms for retinal abnormality detections
- **Optimizing Agricultural Productivity and Food Security:** AI-driven precision farming enhances crop yield predictions, optimizes irrigation, and reduces input wastage.
 - **Remote sensing with AI helps detect pest infestations**, soil health issues, and climate-related risks.
 - For instance, **'Kisan e-Mitra', an AI-powered chatbot**, has been developed to assist farmers with responses to the queries about the PM Kisan Samman Nidhi scheme.
 - **National Pest Surveillance System**, for tackling the loss of produce due to climate change, **utilizes AI and Machine Learning** to detect pest infestation in crop issues, enabling timely intervention for healthier crops.
- **Enhancing Justice Delivery and Legal Systems:** AI accelerates case processing, reducing legal backlogs and improving judicial efficiency.
 - AI-driven legal research tools assist judges and lawyers in analyzing precedents and drafting judgments.
 - Automated translation tools improve access to justice in multilingual societies.
 - For instance, **SUPACE (Supreme Court Portal for Assistance in Court's Efficiency)** is an AI-powered tool that helps judges research cases.
 - It was introduced by Chief Justice of India S.A. Bobde in April 2021.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Tackling Climate Change and Environmental Management:** AI aids in hyperlocal weather forecasting, climate modeling, disaster prediction, and real-time environmental monitoring.
 - AI-powered sensors track pollution levels, enabling timely intervention in urban areas. Smart grids and AI-driven energy management optimize renewable energy consumption.
 - **Google's DeepMind** uses AI to improve weather forecasting. **IBM Watsonx.ai's** geospatial foundation model, **built on NASA's satellite data**, analyzes global weather patterns, tracks land use changes, and predicts crop yields, functioning at both global and local scales.
 - Also, the **CoS-it-FloWS** was introduced in the **Periyar and Chalakudy river basins**, leveraging **AI models** for flood prediction. It employs **dynamic visualization and interactive maps** to analyze climate data trends and enhance forecasting accuracy.
- **Enhancing Education and Personalized Learning:** AI-powered EdTech platforms provide adaptive learning, ensuring customized education for students based on their learning pace.
 - AI-driven language translation tools enable content accessibility in multiple regional languages.
 - The **global artificial intelligence** in education market was valued at \$2.5 billion in 2022, and is projected to reach **\$88.2 billion by 2032**.
 - India's Education Ministry is also exploring ways to integrate AI on govt's online education platform **DIKSHA**.
- **Strengthening Urban Governance and Smart Cities:** AI-driven traffic management reduces congestion and enhances urban mobility.
 - AI-powered waste management systems optimize garbage collection and recycling.
 - For instance, **Bengaluru has implemented an AI-driven Adaptive Traffic Control System (ATCS)** at 41 junctions, reducing the need for manual traffic management.
- **Improving Financial Governance and Taxation:** AI automated fraud detection, enhancing financial transparency and reducing tax evasion.

- AI-powered chatbots simplify tax filing and grievance redressal for citizens. AI-based predictive analytics help optimize subsidy allocations, preventing leakages.
 - Automated auditing systems improve compliance monitoring in financial transactions.
- For instance, the **Reserve Bank of India (RBI)** has developed an AI/ML-based model called **MuleHunter.ai** to tackle the issue of **mule accounts**, which are used for financial fraud.

What are the Key Issues that AI Poses to India's Governance Landscape?

- **Job Displacement and Impact on the Labor Market:** AI-driven automation threatens millions of low-skilled and routine jobs, especially in manufacturing, BPOs, and the gig economy.
 - India's labor-intensive industries, which **rely heavily on a large workforce**, face risks of mass unemployment if reskilling efforts do not keep pace.
 - If AI adoption is not balanced with human-centric policies, rising inequality and job losses could trigger social unrest.
 - For instance, a study by the **World Economic Forum** suggests that AI could displace **75 million jobs in India by 2025**.
- **Algorithmic Bias and Discriminatory Outcomes:** AI models trained on datasets can potentially **reinforce caste, gender, and regional discrimination**, leading to unfair governance decisions.
 - For instance, in 2018, **Amazon discontinued its secret AI recruiting tool** after it was found to be biased against women.
 - Also, the **lack of diverse and representative datasets in India** exacerbates exclusionary outcomes, particularly for marginalized communities.
 - Without strong bias-mitigation frameworks, AI could replicate systemic prejudices rather than resolving them.
- **Privacy Violations and Mass Surveillance Risks:** AI-powered surveillance, including **facial recognition and predictive policing**, raises concerns about discrepancies and mass data collection without adequate safeguards.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- For instance, the Delhi Police considers facial recognition technology (FRT) matches with over **80% similarity as positive results, which may raise concerns.**
 - Also, in 2024, **UPSC announced plans to adopt facial recognition and AI-powered CCTV surveillance** to prevent cheating and impersonation in exams. While a positive step for exam integrity, it may raise concerns over privacy and data security.
 - **Deepfakes and Misinformation:** AI-generated deep fakes and misinformation campaigns can **undermine elections, disrupt governance, and erode public trust in institutions.**
 - The increasing sophistication of AI-generated content makes it harder to distinguish real from fake news, exacerbating social polarization.
 - Deepfake cases in India have surged by **550% since 2019**, with losses projected to reach Rs 70,000 crore in 2024 alone.
 - Deep Fake videos of **Prime Minister Modi and opposition leaders** went viral before India's **2024 general elections**, raising concerns about election integrity.
 - **Cybersecurity Vulnerabilities and AI-Powered Attacks:** AI-powered cyberattacks, including phishing and automated hacking, pose severe risks to India's digital infrastructure.
 - Critical sectors like **banking, defense, and healthcare** face AI-enhanced security threats that existing cybersecurity measures may not withstand.
 - Without AI-powered countermeasures, India's digital ecosystem remains highly vulnerable to sophisticated threats.
 - Indians lost nearly **Rs 12,000 crore to cyber scams in 2024**, with scams increasing by **300%**, driven by Artificial Intelligence.
 - **Digital Divide and Unequal AI Access:** AI adoption remains **highly uneven**, favoring **urban areas while leaving rural India behind**, deepening the digital divide.
 - Limited internet penetration, lack of AI literacy, and infrastructure deficits prevent equitable AI benefits, particularly for marginalized communities.
 - According to the NSSO data, **only 24% of rural Indian households have access to the Internet**,
- compared to a 66% penetration in cities, limiting AI-driven governance benefits in rural service delivery.
- NITI Aayog's report estimates **that only 22% of the firms in India use AI in any business process.**
- **AI-Induced Environmental Concerns:** AI systems require vast computing power, leading to increased **energy consumption and carbon emissions.**
 - The **growth of AI data centers in India** raises concerns over electricity demand and water usage for cooling infrastructure.
 - Without green AI policies, rapid AI expansion could conflict with India's sustainability goals.
 - According to the **International Energy Agency**, **a single ChatGPT search consumes 2.9 watt-hours**, compared to 0.3 watt-hours for a Google search.
 - A Goldman Sachs report estimates that **AI demand will add 200 terawatt-hours** of annual power consumption in data centers from **2023 to 2030.**
- **Weak AI Regulations and Policy Gaps:** India lacks a **comprehensive AI regulatory framework**, leading to unchecked AI development and deployment. Unlike the **EU's AI Act**, India has yet to introduce **stringent AI-specific laws**, leaving legal loopholes.
 - Also, AI decision-making in governance raises fundamental ethical questions about accountability and transparency.
 - The **absence of clear legal frameworks** makes it unclear who is responsible when AI-driven errors occur in governance.
- **Dependency on Foreign AI Technologies:** India relies heavily on foreign AI infrastructure, including **cloud services and advanced AI chips**, creating strategic vulnerabilities.
 - Without domestic AI innovation, **India risks economic dependency on US and Chinese AI firms**, affecting digital sovereignty.
 - The lack of indigenous AI R&D hampers self-reliance, making national security and economic interests vulnerable.
 - The recent, US administration's proposal for a new framework that **restricts the import of artificial intelligence chips** due to national security concerns **threatens India's AI hardware plans**

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



What are the Key Issues that AI Poses to Global Governance?

- **Regulatory Fragmentation and Lack of Global AI Standards** :Countries have diverging AI policies, with the **EU enforcing strict regulations (AI Act)**, while the **US and China** take more open-market approaches, leading to **lack of harmonization** in AI governance.
- **AI-Driven Misinformation and Threats to Democracy**: Deepfakes and AI-generated disinformation are being used to manipulate elections and destabilize nations, as seen in **AI-powered misinformation during the 2024 US elections**.
- **AI Weaponization and Autonomous Warfare Risks**: The rise of **autonomous lethal weapons (killer drones)** and AI-driven cyber warfare increases security threats, with the **UN struggling to regulate AI in military use**.
- **AI Bias and Ethical Concerns in Decision-Making** – AI systems trained on biased data lead to discrimination in law enforcement, banking, and healthcare, as seen in **racial bias in AI policing tools in the US**.
- **Surveillance and Privacy Violations** – Governments and corporations misuse AI for mass surveillance, eroding privacy, as seen in **China's AI-powered social credit system**.
- **Global South's AI Disadvantage and Digital Colonialism**: AI development is dominated by the **US, China, and EU tech giants**, leaving **developing nations dependent on foreign AI infrastructure** and widening the digital divide.

What Measures can India Adopt to Enhance AI Regulatory Framework and Shape Global AI Order?

- **Comprehensive AI Law with a Balanced Regulatory Approach**: India must **draft a dedicated AI law** that balances **innovation and regulation**, avoiding the extremes of the **EU's over-regulation** and the **US's laissez-faire approach**.
 - A flexible, **risk-based AI governance model** can classify AI systems into **low, medium, and high-risk categories**, ensuring **proportionate regulation**.
- AI-specific laws should include provisions for **algorithmic accountability, bias mitigation, and ethical AI development**.
 - Accelerating the passage of the **Digital India (AI) Act** with sector-specific guidelines would create a strong yet adaptable AI governance framework.
 - Also, India's **Digital Personal Data Protection Act (DPDP Act, 2023)** must be expanded to address **AI-specific risks**, particularly in **automated decision-making, AI surveillance, and deepfake prevention**.
- **Setting Up a National AI Regulatory Authority**: India can establish an AI Governance Authority (AIGA) to oversee AI ethics, compliance, risk assessment, and public-private collaboration.
 - The authority should mandate **AI audits, impact assessments, and algorithmic transparency standards** to prevent biased or harmful outcomes.
 - AIGA can also **certify AI products based on ethical compliance**, similar to how **BIS certifies electronic goods**.
 - Also, **UNESCO's Recommendation on the Ethics of AI** serves as a comprehensive framework for ensuring ethical governance of AI
- **Leading AI Safety for the Global South**: India can position itself as a **leader in AI safety for developing nations** by shaping **inclusive and equitable AI governance**.
 - By leveraging its **Digital Public Infrastructure (DPI) model**, India can assist Global South nations in **building AI regulatory capacity** while preventing **Western-dominated AI frameworks from dictating AI ethics globally**.
 - Establishing an **AI ethics consortium** within BRICS or G20 could help **develop alternative governance models** suited for emerging economies.
- **Promoting Explainable and Trustworthy AI**: India should mandate **Explainable AI (XAI) policies**, ensuring that **government and private AI models remain transparent and interpretable**.
 - Regulatory frameworks should include **algorithmic accountability rules**, where AI-driven decisions in **banking, recruitment, and governance** must be explainable to affected individuals.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Regulating AI in Law Enforcement and National Security:** AI in policing, surveillance, and cybersecurity should follow **clear legal safeguards** to prevent **mass surveillance, wrongful profiling, and human rights violations**.
 - The government should introduce an **AI Accountability Code for Law Enforcement**, ensuring AI-driven facial recognition, crime prediction, and biometric verification are used **transparently and with judicial oversight**.
 - India should also **develop AI-enabled cybersecurity strategies** to counter **AI-driven cyber threats and misinformation warfare**.
- **Creating AI Sandboxes for Innovation-Friendly Regulation:** India should set up **AI regulatory sandboxes**, where startups, businesses, and policymakers can **test AI applications in real-world conditions with temporary relaxations on certain regulations**.
 - These sandboxes can operate under **sector-specific AI guidelines**, allowing **financial, healthcare, and education AI models to be tested in a controlled legal environment**.
 - The **RBI's FinTech regulatory sandbox model** can be expanded to AI-driven **financial services, such as AI-powered credit scoring and fraud detection systems**.
- **Boosting Indigenous AI Development for Digital Sovereignty:** India must **reduce its dependence on foreign AI models, computing power, and semiconductor supply chains** by investing in **domestic AI chip manufacturing, cloud infrastructure, and sovereign AI models**.
 - The **IndiaAI Mission** and **National SuperComputing Mission** should focus on building **India's AI supercomputing capacity**, ensuring **self-reliance in AI research**.
- **Tackling AI-Driven Disinformation and Deepfake Threats:** India should **proactively regulate AI-generated deep fakes, misinformation, and electoral manipulation risk**.
 - The government should introduce an **AI-Verified Content Labeling System**, requiring platforms to **flag AI-generated media and misinformation in political campaigns**.

- AI-powered **fact-checking tools** should be integrated into **government information portals**, preventing **fake news amplification on social media**.
- A **Deep Fake Regulation Rules** can be introduced under **Digital India Act (yet to be passed)** to criminalize **AI-generated political misinformation**, ensuring **election integrity and public trust in governance**.

Conclusion:

The **Paris AI Action Summit** stands as a defining moment for global regulatory frameworks, with all eyes on its outcomes. As a **rising digital powerhouse**, India must take the lead in shaping balanced, future-ready regulations that foster innovation while ensuring ethical governance. By championing inclusive and adaptable policies, **India can set a global precedent, reinforcing its position as a key architect of the digital economy**.



India to Become a Fintech Powerhouse

This editorial is based on "[Lessons from India's fintech revolution](#)" which was published in The Hindustan Times on 07/05/2024. The article brings into picture India's fintech revolution, which has enabled a direct shift to mobile-first financial solutions, bypassing traditional banking. While this model serves as a blueprint for emerging economies, addressing key challenges is crucial for global leadership.

Tag: GS Paper - 3, Capital Market, IT & Computers, Cyber Security, Scientific Innovations & Discoveries

India's fintech revolution has **bypassed traditional banking**, enabling millions to **adopt mobile-first financial solutions**. Since **2009**, NPCI has standardized inter-bank transfers, facilitating a direct transition to digital payments—**distinct from the West's gradual evolution**. This **public-private-driven model** serves as a blueprint for emerging economies. However, to establish itself as a **global fintech leader**, India must address key challenges that lie ahead.

How the Fintech Sector Evolved in India?

- **About: Fintech (Financial Technology)** refers to the use of technology to deliver financial services efficiently.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



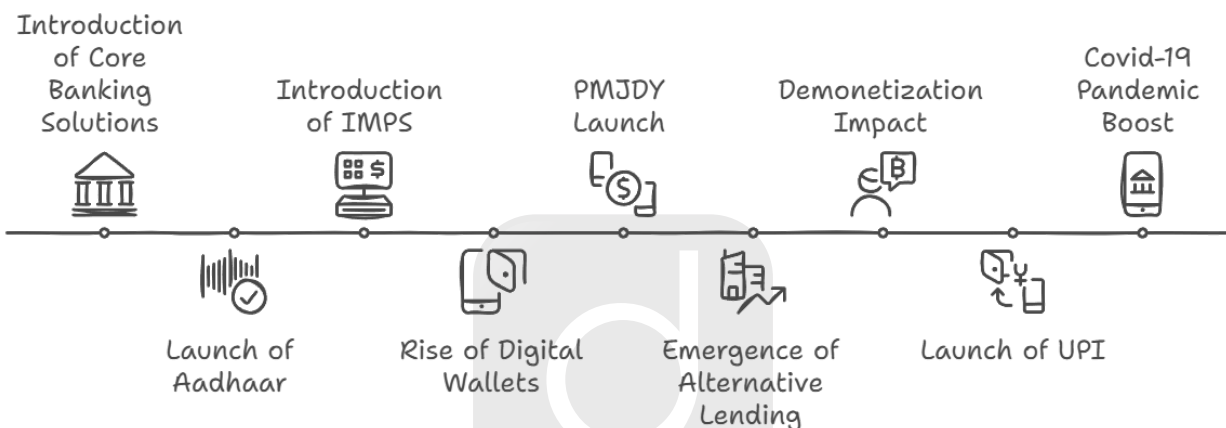
- India's fintech journey has been shaped by factors such as **smartphone penetration**, **internet access**, **regulatory support**, and **digital payment innovations**.

➤ Phases of Evolution

○ Early Phase (Pre-2000s)

- The banking sector relied on **core banking solutions (CBS)** and IT-driven services.
- Introduction of **ATMs**, **NEFT**, **RTGS**, and **electronic clearing services**.

Evolution of Fintech in India



○ Growth Phase (2000–2015)

- **2009**: Launch of Aadhaar, enabling digital identity verification.
- **2010**: Introduction of Immediate Payment Service (IMPS) by NPCI, facilitating real-time transactions.
- **2013**: Rise of digital wallets (e.g., Paytm) due to increasing e-commerce.
- **2014**: **Pradhan Mantri Jan Dhan Yojana (PMJDY)** launched, expanding financial inclusion.
- **2015**: Emergence of alternative lending platforms and digital NBFCs.

○ Acceleration Phase (2016–2020)

- **2016**: **Demonetization** accelerated digital transactions.
- **2016**: Launch of **Unified Payments Interface (UPI)** revolutionized real-time fund transfers.
 - Growth of fintech startups in lending, wealth management, and insurance (e.g., Zerodha, PolicyBazaar, PhonePe).

○ Current Phase (2020–Present)

- **Covid-19 Pandemic (2020)**: Boosted digital banking, contactless payments, and fintech adoption.
- **2021**: **Account Aggregator Framework** launched for seamless financial data sharing.
- **2022**: RBI introduced **Digital Lending Guidelines** to regulate online lending platforms.
- Rise of **Buy Now, Pay Later (BNPL)** models and embedded finance solutions.
 - Growth of **Rupay Credit Card linked UPI payments**, **cryptocurrency exchanges (regulated)**, and **AI-driven financial services**.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



What are the Key Drivers of Fintech Growth in India?

- **Rapid Digital Adoption, Smartphone Penetration and 5G:** The widespread availability of **affordable smartphones** and **cheap internet** has driven digital financial services.
 - With over **80 crore internet users**, fintech solutions have become accessible even in rural areas, bridging the financial inclusion gap.
 - According to a recent survey The percentage of households with smartphones, as well as internet connectivity, is around **88%**
 - **5G subscriptions** in India are expected to account for nearly **65% of all mobile subscriptions** by the end of 2029 reaching 840 million.
- **Government Initiatives and Regulatory Support:** The Indian government's push for a cashless economy through **Digital India, JAM Trinity (Jan Dhan-Aadhaar-Mobile)**, and financial inclusion schemes has significantly boosted fintech.
 - Over **54.58 crore Jan Dhan accounts** are opened as of 15th January, 2025, with **55.7% held by women**.
 - **RBI and SEBI** have introduced regulatory frameworks for **digital lending, digital banking units, and account aggregators**, ensuring a stable environment for fintech growth.
- **UPI Revolution and Payment Innovations:** India's **Unified Payments Interface (UPI)** has transformed digital transactions, offering seamless interoperability and zero-cost transactions.
 - The launch of **UPI-linked credit card payments** has further expanded its reach.
 - **UPI** is projected to account for **90% of the total transaction** volume in retail digital payments over the next 5 years.
 - India is expanding **UPI adoption in global markets**, with partnerships in Singapore, UAE, and France (NPCI).
- **Rise of Digital Lending and Alternative Credit Models:** Fintech-driven lending has expanded access to credit, especially for **MSMEs** and gig workers, using AI-based risk assessment instead of traditional credit scores.
 - Digital lenders and **Buy Now, Pay Later (BNPL)** models are reshaping consumer finance, offering instant, collateral-free credit.
- The size of the Indian digital lending companies is set to grow from **USD 38.2 billion in 2021** to nearly **USD 515 billion by 2030**.
- **Growth of InsurTech and WealthTech Platforms:** The fintech sector has disrupted **insurance (InsurTech)** and **wealth management (WealthTech)**, making financial products more accessible through digital channels.
 - AI-powered advisory services, robo-advisors, and blockchain-driven insurance claims have enhanced efficiency and transparency in financial planning.
 - The **WealthTech market** in India is projected to exceed **\$60 billion by 2025**, growing at a **12–15% CAGR (NASSCOM)**.
 - The **Indian InsurTech sector** has witnessed a **12-fold revenue growth** over the past five years to \$750 million in 2023, according to a report released by Boston Consulting Group
- **Expansion of Embedded Finance and Open Banking:** Embedded finance, where financial services are integrated into non-financial platforms (e.g., **Amazon Pay, Ola Money**), is driving seamless transactions.
 - Open Banking, facilitated by the **Account Aggregator framework**, enables secure financial data sharing, improving credit access for individuals and businesses.
 - Embedded finance can unlock \$25 billion revenue opportunity for India's digital and financial services platforms by 2030.
 - **India's Account Aggregator (AA)** ecosystem has expanded significantly, with **1.1 billion AA-enabled accounts** and **2.05 million users** voluntarily sharing their financial data with banks and financial institutions to access loans and secure better, faster deals on financial products.
- **Rise of Blockchain and CBDC (Digital Rupee):** Blockchain technology is enhancing security, transparency, and efficiency in financial transactions.
 - The RBI's launch of the **Central Bank Digital Currency (CBDC) or Digital Rupee** aims to modernize the payment ecosystem, reducing dependency on cash.
 - The latest Currency and Finance Report indicates that the number of retail **e-rupee users reached 5 million** by the end of June 2024.
 - India's blockchain technology market generated **USD 321.5 million in revenue in 2022** and is projected to grow to **USD 53,182.9 million by 2030**

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Increasing Foreign Investments and Fintech Startups Boom:** India's fintech ecosystem is one of the **world's fastest-growing, attracting global investors.**
 - The combination of a vast consumer base, progressive regulations, and technological advancements makes India a fintech hub.
 - India has over **2,500 fintech startups**, second only to the US (**Invest India**).

What are the Key Issues Related to the Fintech Sector in India?

- **Regulatory Uncertainty and Compliance Challenges:** The fintech sector in India operates in a **rapidly evolving regulatory environment**, leading to uncertainty for startups and investors.
 - **RBI banned Paytm Payments Bank (2024)** from onboarding new customers due to regulatory violations, highlighting significant compliance challenges in the sector.
 - Also, the lack of clear guidelines on **AI-enabled fintech, cryptocurrency, and data protection** makes compliance difficult.
- **Cybersecurity Risks and Digital Fraud:** With increasing digital transactions, cyber threats like **phishing, identity theft, and financial fraud have surged.**
 - Many fintech firms lack robust cybersecurity frameworks, exposing customer data to breaches.
 - India witnessed a **65% increase in payment fraud cases in 2023**, with financial losses exceeding **INR 1200 crore.**
 - UPI frauds constituted around 40% of these incidents with **digital arrest** led fraud being the prominent ones.
- **Digital Lending and Predatory Practices:** The rise of digital lending platforms has led to issues like **high-interest rates, unethical recovery practices, and harassment of borrowers.**
 - Many loan apps operate without proper RBI registration, trapping low-income users in debt cycles.
 - While RBI's **Digital Lending Guidelines** aim to regulate the sector, enforcement challenges persist.
- The Indian government recently proposed a law to ban unregulated lending and impose a **Rs 1 crore fine on offenders**, but implementation remains a major concern.
- **Data Privacy and Consent Issues:** Fintech companies collect vast amounts of user data but lack robust frameworks to ensure privacy and transparency.
 - India ranked **5th in global data breaches in 2023**, with 5.3 million leaked accounts.
 - Many apps access **sensitive information without user consent**, leading to data misuse and security concerns.
 - **India's Digital Personal Data Protection Act (2023)** with its recently released rules, is still in its nascent stage.
- **Digital Divide and Financial Inclusion Gaps:** Despite fintech growth, **rural and semi-urban India** still faces challenges in accessing digital financial services.
 - **Limited internet penetration, lack of digital literacy**, and language barriers prevent millions from benefiting from fintech solutions. T
 - The JAM (Jan Dhan-Aadhaar-Mobile) framework has expanded access, but digital adoption remains slow.
 - Only **38%** of rural or semi urban Indians use digital financial services. **Also, 11.30 crore** Jan Dhan accounts remain inactive.
- **High Customer Acquisition Costs and Profitability Concerns:** Fintech startups struggle with high customer acquisition costs due to **intense competition and heavy reliance on discounts and cashback offers.**
 - Many firms operate on **thin margins, making long-term profitability a challenge.** The lack of a sustainable revenue model has led to the shutdown of several startups.
 - Fintechs in India raised just **USD 2.1 billion in 2023**, reflecting a nearly **300% drop from 2022.**
- **Monopoly Concerns and Lack of Market Competition:** A few players dominate India's fintech ecosystem, leading to concerns about monopolistic practices.
 - **Three firms control over 94% of UPI transactions** – PhonePe, Google Pay, and Paytm.
 - Lack of competition reduces innovation and creates dependency on a handful of platforms.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- NPCI introduced **UPI market cap rules** to limit the dominance of big players, but full implementation is delayed and deadlines keep getting extended.

What Steps can India take to Revitalize its Fintech Sector and become a Global Model?

- **Establishing a Comprehensive and Adaptive Regulatory Framework:** India needs a **unified and dynamic regulatory framework** that balances innovation with consumer protection.
 - Clear guidelines on **digital lending, data privacy, cryptocurrency, and embedded finance** will create stability for fintech players.
 - A **Regulatory Sandbox 2.0** can allow controlled testing of new financial products before full-scale implementation.
 - Strengthening coordination between **RBI, SEBI, and NPCI** will ensure streamlined oversight.
- **Strengthening Data Protection and Cybersecurity Infrastructure:** **Digital Personal Data Protection Law** should be complemented with clear provisions on **consent, data portability, and security**, that will safeguard user privacy.
 - Mandating **zero-trust security architecture** and AI-driven fraud detection will enhance cybersecurity resilience.
 - **Stricter penalties for data breaches and compliance mandates** for fintech firms will build consumer trust.
 - Promoting indigenous cybersecurity startups can reduce reliance on foreign security solutions.
 - Also, India can **lead global fintech security standards by integrating blockchain** for secure transactions.
- **Financial Inclusion through Regional Language Fintech Solutions:** To bridge the **digital divide**, fintech platforms must provide multilingual, voice-enabled, and AI-driven interfaces.
 - Leveraging **UPI Lite, offline payments, and feature-phone banking** will improve accessibility for low-income groups.
 - Encouraging Indian fintech startups to develop **vernacular financial literacy programs** will enhance adoption in rural areas.
- Special financial products tailored for **MSMEs, gig workers, and women entrepreneurs** will promote inclusive growth. India can showcase fintech as a tool for mass financial empowerment to the world.
- **Encouraging Open Banking and Interoperability for Seamless Transactions:** A well-structured **Open Banking ecosystem**, supported by the **Account Aggregator framework**, will enable secure and seamless financial data sharing.
 - Mandating **universal API standards** will improve interoperability among fintech firms, banks, and NBFCs.
 - Expanding **UPI-like models for global remittances and cross-border transactions (as initiated by India with UAE)** will enhance India's global fintech footprint.
 - Ensuring fair access to financial data while **preventing monopolistic control will promote healthy competition**. Open banking can position India as a model for democratic digital finance.
- **Scaling Embedded Finance and BNPL with Responsible Lending Guidelines:** Embedded finance (fintech within non-financial platforms) and **Buy Now, Pay Later (BNPL)** models must be regulated with consumer protection safeguards.
 - Mandatory **risk assessment algorithms** will prevent over-lending and debt traps.
 - Introducing a **Central Digital Credit Bureau** can monitor alternative credit lending in real time.
 - Encouraging ethical lending practices through **interest rate transparency and responsible debt collection policies** will reduce predatory lending.
- **Strengthening Fintech Funding:** To sustain fintech innovation, **Fintech Venture Funds** backed by government-private partnerships should provide early-stage capital.
 - **Tax incentives for startups in AI-driven finance, blockchain, and cybersecurity** will attract more fintech entrepreneurs.
 - Expanding **co-lending models between fintech firms and traditional banks** can create hybrid financial solutions.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Ensuring fintech startups have a clear **path to profitability** instead of over-reliance on cashbacks and discounts will make the sector more resilient.
 - A balanced funding ecosystem will establish India as a **global fintech hub**.
- **Leveraging AI, Blockchain, and Quantum Computing for Next-Gen Fintech:** Encouraging AI-driven wealth management, fraud detection, and automated lending can enhance financial efficiency.
 - Blockchain-powered **smart contracts** for trade finance and asset tokenization will drive financial innovation.
 - Exploring **quantum computing** for ultra-secure **transactions** will place India at the forefront of fintech security research.
 - Promoting **decentralized finance (DeFi)** regulations will enable India to lead in Web3-driven financial systems.
 - Adopting deep-tech-driven fintech models will position India as a **next-generation financial powerhouse**.
- **Institutionalizing Global Fintech Standards and Thought Leadership:** India should lead international fintech standardization efforts through the G20, BIS, and IMF to influence global regulations.
 - Establishing an **India Global Fintech Institute** to conduct research, policymaking, and regulatory innovation will strengthen thought leadership.
 - India can emerge as the **Silicon Valley of Fintech** by driving regulatory and technological best practices.

Conclusion:

India's fintech revolution has **redefined financial inclusion through digital payments, AI-driven lending, and blockchain innovations**. Strengthening data protection, fostering competition, and enhancing global fintech partnerships will be key to leadership in the sector. A balanced approach—**promoting innovation while ensuring consumer protection**—can position India as a **global fintech powerhouse**.



Reimagining Governor's Role in Indian Democracy

*This editorial is based on "**Wilful violation: On the Tamil Nadu Governor's conduct**" which was published in The Hindu on 13/01/2025. The article brings into focus the Supreme Court's scrutiny of the Tamil Nadu Governor, highlighting concerns over gubernatorial overreach in withholding assent to state Bills. This crisis underscores the need to reassess the Governor's role in India's federal structure.*

Tag: GS Paper - 2, Constitutional Bodies, Role of Governor, Co-operative Federalism, Centre-State Relations, 2nd ARC

The **Supreme Court's** recent scrutiny of the **Tamil Nadu Governor** highlights a growing pattern of **constitutional overreach by gubernatorial offices**. The case revolves around the **Governor withholding assent to Bills** and **referring them to the President**, despite constitutional provisions mandating approval after a second passage by the State Assembly. **Prolonged delays and alleged obstruction of state legislation** have intensified concerns about the misuse of gubernatorial powers. While the Attorney-General cites conflicts with central laws, the core issue remains the **Governor's engagement in state governance**. This crisis underscores the urgent need to **reassess the role and authority of Governors in India's federal structure**.

What are the Key Constitutional Functions of the Governor in India?

- **Executive Head of the State:** The Governor serves as the chief executive head of the state, functioning as a nominal authority while also **acting as an agent of the central government**.
 - As per **Article 154**, all executive actions of the state government are carried out in the Governor's name, and under **Article 166**, rules for transaction of business are formulated by the Governor.
 - Additionally, the Governor appoints the **Chief Minister** and, on their advice, the Council of Ministers.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Legislative Role and Assent to Bills:** As the constitutional link between the state legislature and the Union, the Governor summons, prorogues, and dissolves the state assembly under **Article 174**.
 - A Bill must receive the **Governor's assent to become law**, similar to the President at the Union level, or it may be reserved for the President's consideration under Article 200.
 - The Governor plays a crucial role in the state's financial governance, as no Money Bill can be introduced in the assembly without their recommendation under **Article 207**.
 - They also ensure **state finances comply with constitutional and fiscal responsibilities**.
- **Discretionary Powers and Role in Hung Assemblies:** The Governor exercises discretionary powers in certain situations, such as **recommending President's Rule under Article 356** or inviting a party to form the government in case of a hung assembly.
 - They also **decide on matters where the Constitution grants them discretion**, independent of the Council of Ministers' advice.
- **Role in Appointments and Administration:** The Governor appoints key functionaries, including the **Advocate General**, and members of the **State Public Service Commission** under **Articles 165, and 316**.
 - They **appoint Vice-Chancellors** of state universities, which has been a contentious issue in recent years.
 - This function ensures the smooth administration of the state, but must be exercised in consultation with the state government.
- **Role in Implementing President's Rule:** Under **Article 356**, if the Governor believes that the constitutional machinery in a state has failed, they can recommend President's Rule.
 - This provision is meant as an **emergency** measure but has often been misused for political gains.
 - The Supreme Court has ruled that such recommendations must be justified and not arbitrary.
- **Judicial Powers:** The Governor of an Indian state holds pardoning powers under Article 161 of the Constitution, allowing them to grant **pardons, reprieves, respites, or remissions of punishment for offenses against state laws**.

- However, this power is limited compared to the President's authority in cases of pardoning, as the **Governor cannot pardon death sentences or court-martial cases**.

- This provision ensures a system of checks and balances while allowing humanitarian considerations in justice.

- **Special Responsibilities for Scheduled Areas and Tribal Welfare:** In the states of **Assam, Meghalaya, Tripura, and Mizoram**, the Governor has special powers over Scheduled Areas.

- These states are administered as **Autonomous Districts** under the Sixth Schedule of the Constitution.
- They can intervene in tribal administration to protect indigenous rights and promote welfare policies.

What are the Key Concerns Related to the Office of Governor in India?

- **Delay in Granting Assent to Bills:** Governors have increasingly withheld or delayed assent to Bills passed by state legislatures, undermining the legislative process and federal principles.
 - While **Article 200** allows Governors to reserve Bills for the President's consideration, excessive delays create legislative paralysis.
 - The Supreme Court has emphasized that the phrase "**as soon as possible**" in Article 200 must be followed in letter and spirit, yet delays of **over two years** have been observed in multiple states.
 - **Example:** In **Punjab (2023)**, Governor withheld assent to multiple Bills for two years, leading to the Supreme Court's intervention.
 - Similarly, in **Tamil Nadu**, the Governor delayed **12 Bills**, prompting judicial intervention.
- **Partisan Conduct and Central Influence:** Governors, appointed by the Centre, often act in ways that align with the ruling party at the Union, rather than being neutral arbiters.
 - This raises concerns about **political bias and misuse of discretionary powers** to destabilize opposition-led state governments.
 - **Example:** In **Arunachal Pradesh (2016)**, Governor actions led to the dismissal of the elected government, which was later reinstated by the Supreme Court.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



➤ **Misuse of Discretionary Powers in Government Formation:** Governors often **exercise discretion arbitrarily** when inviting parties to form the government in case of a hung assembly.

- The **lack of clear guidelines** results in inconsistent decisions, sometimes favoring particular parties, thereby distorting the democratic mandate.
- **Example:** In **Karnataka (2018)**, the Governor gave a political party **15 days** to prove majority, later reduced to **24 hours** by the Supreme Court.
 - In **Maharashtra (2019)**, Governor Koshyari's decision to swear in a **chief minister candidate** without proving majority led to an **80-hour government**.

➤ **Conflict Over University Appointments:** Governors, as **Chancellors of state universities**, often interfere in appointments, overriding elected governments.

- This has led to **standoffs between state governments and Governors over Vice-Chancellor selections**, with courts frequently having to intervene.
- The growing tussle has raised questions about **whether Governors should continue as university Chancellors**.
- **Example:** In **West Bengal (2023)**, the Governor unilaterally appointed Vice-Chancellors, leading to a legal battle with the state government.

➤ **Lack of Accountability and Transparency:** Unlike the Chief Minister, who is accountable to the legislature, the Governor is only accountable to the President and can be removed **at the Union government's discretion (Article 156)**.

- This creates a situation where Governors act **without facing any direct consequences for their actions**.
 - The **lack of impeachment provisions** further shields them from scrutiny, making them unaccountable despite holding significant powers.

➤ **Overreach in Administrative Matters:** Governors have increasingly interfered in day-to-day governance, bypassing the **elected Chief Minister and Council of Ministers (Article 163)**.

- This overreach often leads to governance paralysis, where **Governors refuse to clear files, delay cabinet decisions, or publicly criticize state policies**.

○ **Example:** In **Delhi (2023)**, frequent clashes between the **Lieutenant Governor and the state government** over bureaucratic appointments led the Supreme Court to rule that **Delhi's elected government has control over services, not the LG**.

➤ **Arbitrary Use of President's Rule:** Governors have historically been instrumental in **invoking Article 356** (President's Rule), often on dubious grounds, leading to the dismissal of elected governments.

○ Although the **S.R. Bommai judgment (1994)** limited such misuse, recent instances suggest that **Governors continue to play a role in politically motivated dismissals**.

○ **Example:** In **Uttarakhand (2016)**, the Governor recommended President's Rule **just before a floor test**.

What Measures can be Adopted to Redefine and Enhance the Position of Governor in India?

➤ **Defining Time Limits for Governors Decisions on Bills:** Governors should be made to act on Bills within a **fixed timeframe** to prevent legislative paralysis and uphold federal principles.

○ The **Supreme Court in the Punjab case (2023)** ruled that Governors cannot indefinitely delay assent, reinforcing the need for clear timelines.

○ The **Punchhi Commission (2010)** recommended a **six-month limit** for the Governor's decision on reserved Bills.

➤ **Limiting Discretionary Powers in Government Formation:** Governors' discretion in inviting parties to form governments after elections must be clearly defined to prevent partisan bias.

○ The **S.R. Bommai judgment (1994)** limited the Governor's role in dismissing governments, and similar guidelines are needed for **post-election scenarios**.

○ The **Punchhi Commission** suggested following a structured order: **pre-poll alliances > single largest party > post-poll alliances**, preventing manipulations.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Ensuring Neutrality in University Appointments: The position of the Governor can be reassessed as a Chancellor.
 - The **Sarkaria Commission (1988)** recommended that Governors should **not be given statutory powers unrelated to their constitutional role**, and states should have a greater say in university governance.
 - Recently, **West Bengal, Tamil Nadu, and Kerala have passed Bills** reducing the Governor's role in appointing Vice-Chancellors.
 - Establishing **state-level independent commissions** to handle appointments would depoliticize the process.
- **Revising the Appointment and Removal Process:** The appointment process must be more transparent to ensure Governors act independently rather than as agents of the Centre.
 - The **Sarkaria Commission** recommended that Governors should be appointed **after consulting the Chief Minister** to avoid political bias.
 - Similarly, the **Punchhi Commission** advised that Governors should **not have recent political affiliations** to ensure impartiality.
- **Holding Governors Accountable Through Judicial Review:** While **Article 361** grants immunity to Governors, their actions should be subject to judicial scrutiny to prevent unconstitutional conduct.
 - The **Rameshwar Prasad case (2006)** ruled that Governors' decisions can be reviewed if found to be **malicious or unconstitutional**.
 - A **constitutional amendment** to include a **parliamentary accountability mechanism** (such as a Governor's Annual Report to the Rajya Sabha) would increase transparency.
- **Clear Guidelines on Imposing President's Rule (Article 356):** The misuse of **Article 356** has repeatedly led to the arbitrary dismissal of elected governments, necessitating stricter safeguards.
 - The **S.R. Bommai case (1994)** mandated that **President's Rule must be justified and subject to judicial review**.
 - The **Punchhi Commission** advocated for **protecting states' rights by curbing the Centre's power during emergency**, recommending **targeted interventions in troubled areas instead of statewide emergency rule** and **limiting its duration to three months**.

- **Sarkaria Commission** recommended that President Rule should be used as a **measure of last resort** when all available alternatives fail to prevent or rectify the breakdown of the Constitutional Machinery of the State
- **Creating an Impeachment Process for Governors:** Currently, Governors can only be removed by the **President**, leaving no mechanism for holding them accountable at the state level.
 - The **Punchhi Commission** suggested introducing an **impeachment process similar to that of the President**, where state legislatures can pass a resolution for removal. .
 - Also, the Supreme Court in **BP Singhal vs Union of India (2010)** upheld the "**pleasure doctrine**" but emphasized that a Governor's removal must have a valid reason.
 - While the court assumes the President's decision is justified, the Centre must provide reasons if challenged.

Conclusion:

The Governor's role is vital but increasingly contentious due to delays in assent, political bias, and overreach. The Supreme Court has emphasized adherence to constitutional principles and democratic norms. Reforms like time-bound decisions, limiting discretion in government formation, and ensuring neutrality in appointments are crucial. Strengthening accountability through judicial review and parliamentary oversight can prevent misuse.



Strengthening Indo-French Ties

*This editorial is based on "**Shared understanding: On India-France ties**" which was published in The Hindu on 14/02/2025. The article brings into picture the deepening Indo-French partnership, highlighting key agreements in defense, nuclear energy, and AI as both nations pursue strategic autonomy while balancing ties with the US and China.*

Tag: GS Paper - 2, Effect of Policies & Politics of Countries on India's Interests, International Treaties & Agreements

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



The deepening **Indo-French partnership**, marked by their frequent high-level exchanges, reflects a strategic alignment between two powers seeking autonomous paths in an uncertain global landscape. During recent meetings in **Paris and Marseille**, both nations advanced crucial agreements in **defense, nuclear energy, and technological cooperation, particularly in AI**. As shifting geoeconomic policies reshape international dynamics, both nations are strategically positioning themselves as independent powers while maintaining constructive engagement with both the **US and China**.

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

- **Civil Nuclear Collaboration:** India and France are strengthening nuclear energy cooperation to enhance energy security and achieve climate goals.
 - The focus has shifted from large nuclear plants like the **9,900 MW Jaitapur project** to **Small Modular Reactors (SMRs)**, which offer cost-effectiveness and faster deployment.
 - France's expertise in nuclear technology makes it a key partner in India's plan to generate **100 GW of nuclear power by 2047**.
 - The **₹20,000 crore Nuclear Energy Mission** announced in the 2024-25 Budget supports research in SMRs.
- **Defence and Strategic Partnership:** India-France defence ties have deepened through joint military projects, technology transfer, and maritime cooperation.
 - France is a key arms supplier, supporting India's military modernisation through **Rafale jets, Scorpene submarines, and naval cooperation in the Indo-Pacific**.
 - **France** and the United States are emerging as key suppliers to India, collectively accounting for **46%** of its arms imports.
 - Also, in December 2024, the two leaders expressed their support for the launch of **FRIND-X (France-India Defence Startup Excellence)** in Paris.
- **Space and Aerospace Cooperation:** France has been a longstanding partner in India's space ambitions, particularly in **satellite technology, launch vehicles, and climate monitoring**.
 - Collaboration includes joint satellite missions like **TRISHNA (Thermal Infrared Imaging Satellite for High-resolution Natural Resource Assessment)** and joint research on space security.
- India's space startups are also benefiting from **France's expertise in AI-based satellite applications**.
- In 2021, the **Indian Space Research Organisation (ISRO)** and the French space agency CNES signed a new space cooperation agreement at the **Human Space Flight Centre (HSFC)** in Bangalore.
- **Artificial Intelligence and Technology Innovation:** India and France are leveraging AI for economic and strategic growth while focusing on **ethical AI development**.
 - Recently, the Indian Prime Minister and French President unveiled the **India-France Roadmap on Artificial Intelligence (AI)**, reflecting their shared vision for developing **safe, open, secure, and trustworthy AI**.
 - They welcomed the participation of Indian startups at the **French startup incubator Station F** and acknowledged the expanded opportunities for utilizing India's real-time payment system, **Unified Payments Interface (UPI)**, in France.
- **Indo-Pacific Security and Maritime Cooperation:** France, with its territories in the Indo-Pacific, aligns with India's vision of a **free, open, and rules-based maritime order**.
 - Both nations conduct **joint naval exercises (Varuna)** and are developing joint projects for **climate resilience and connectivity in third countries**.
 - The **India-France Indo-Pacific Triangular Cooperation** aims to finance sustainable projects.
- **Economic and Trade Relations:** France is one of India's largest European investors, focusing on **manufacturing, clean energy, and financial services**.
 - India-France trade is expanding, especially in **high-tech sectors and electric mobility**.
 - The **India-Middle East-Europe Economic Corridor (IMEC)**, where France proposes Marseille as a hub, will boost connectivity and trade.
 - Trade relations between India and France have witnessed steady growth, with bilateral trade reaching an impressive **USD 13.38 billion in 2023-24**.
- **Renewable Energy and Green Technologies:** Both countries are working together on **climate action, renewable energy, and decarbonisation**.
 - France supports India's **solar and hydrogen economy**, particularly under the **International Solar Alliance (ISA)**.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Joint research on **energy storage solutions and grid modernisation** ensures efficient renewable integration.
- France is also aiding India's **National Green Hydrogen Mission** with technical expertise.
- **Education and Cultural Exchange:** France is a top European destination for Indian students, with **7,344 Indian students enrolling in the 2023-24 academic year**
 - The **Young Professionals Scheme (YPS)** India-France Migration and Mobility Partnership Agreement (MMPA) aims to enhance mobility, while joint cultural programs strengthen people-to-people ties.

What are the Key Areas of Friction Between India and France?

- **Delays in Defence Procurement and Technology Transfer:** India's defence deals with France have often faced bureaucratic delays, cost escalations, and policy hurdles.
 - Projects like **Rafale jets, Scorpene submarines, and jet engine collaborations** have been slowed due to **contract negotiations, policy changes, and localisation demands**.
 - The **Scorpene submarine project** under **Project 75(I)** has faced delays since 2017.
- **Civil Nuclear Energy Roadblocks:** Despite strong nuclear cooperation, projects like **the Jaitapur nuclear plant (9,900 MW)** face hurdles related to **high costs, local protests, and legal ambiguities**.
 - The **Civil Liability for Nuclear Damage Act, 2010**, places financial liability on suppliers, discouraging French nuclear firms from deeper collaboration.
 - In 2023, France stated that **nuclear liability issues** for the Jaitapur project remain unresolved.
- **Trade Imbalances and Market Access Issues:** While trade between India and France is growing, barriers like **high tariffs, regulatory hurdles, and localisation requirements** create friction.
 - France seeks greater access for its **pharmaceutical, luxury goods, and defence industries**, while India demands easier entry for **IT, agriculture, and generic drugs** in the French market.
 - The slow progress on **India-EU Free Trade Agreement (FTA)** further complicates the trade dynamic.

- **Disagreements on Global AI and Data Regulation:** While India and France collaborate on **AI development**, differences persist over **data privacy and digital regulation**.
 - France supports the **EU's strict General Data Protection Regulation (GDPR)** model, while India prefers a **flexible, innovation-friendly approach** under its **Digital Personal Data Protection Act, 2023**.
 - Disagreements over **open-source AI, cybersecurity norms, and digital sovereignty** could limit deeper AI cooperation.
- **Divergences in Indo-Pacific and Strategic Autonomy:** While both nations support a free and open Indo-Pacific, their approaches differ in **military alignment and strategic independence**.
 - **France, a NATO member**, often aligns with Western policies, while India follows a **multipolar, non-aligned strategy**.
 - India's growing ties with **Russia (for energy and defence)** sometimes create tensions with France, which has strongly opposed Russia's Ukraine invasion.
 - India refused to **join NATO-led sanctions on Russia** after the Ukraine war, while France has been a **key military backer of Ukraine**.
- **Immigration and Mobility Restrictions:** Despite growing educational and professional ties, **visa restrictions, work permit limits, and recognition of Indian qualifications** remain challenges for Indian students and professionals in France.
 - India seeks **easier residency and work opportunities** for its skilled workforce, but France prioritises **EU-wide immigration policies**, limiting flexibility.
 - The **Young Professionals Scheme (YPS)** is launched to ease mobility, but France looks to **tighten Schengen visa policies**.

What Measures can India Adopt to Further Strengthen Ties with France?

- **Fast-Track Defence Co-Development and Technology Sharing:** India should shift from a **buyer-seller relationship** to **joint development and production** of advanced defence technologies.
 - Establishing dedicated R&D centres for **jet engines, naval propulsion, and missile systems** under **India's Defence Industrial Roadmap** with France can boost indigenisation.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Expediting negotiations on **Project 75(I) submarines and Rafale-M for the Navy** will strengthen maritime security cooperation.
- To accelerate nuclear collaboration, India must **revise the Civil Liability for Nuclear Damage Act, 2010**, ensuring balanced supplier liability without deterring foreign investment.
 - Faster approvals for the **Jaitapur Nuclear Power Plant** and clarity on **power purchase agreements (PPAs)** will enhance investor confidence.
- **Strengthening AI and Digital Sovereignty Cooperation:** India should align its AI regulations with **France's AI ethics framework**, ensuring **data sovereignty, cyber resilience, and secure AI governance**.
 - Creating a **bilateral AI Innovation Fund** to support Indian and French startups in **trustworthy AI, cybersecurity, and semiconductors** will accelerate cooperation.
 - Expanding the **India-France AI Roadmap** to include **joint AI research labs and talent exchange programs** can drive leadership in **ethical AI development**.
- **Expanding Indo-Pacific Maritime Security Collaboration:** India and France should transition from **joint exercises like Varuna** to **permanent maritime task forces** for patrolling the Indian Ocean and South Pacific.
 - Enhancing **intelligence sharing, interoperability, and naval logistics agreements** will strengthen deterrence against regional threats.
 - Setting up a **Maritime Innovation and Security Hub** in the **Reunion Islands** with Indian participation will deepen Indo-Pacific strategic engagement.
- **Accelerating Green Hydrogen and Renewable Energy Investments:** India should facilitate **technology transfer agreements** with France for **electrolyser manufacturing, hydrogen fuel cells, and energy storage systems**.
 - Expanding the scope of **France's investments under India's ₹19,700 crore National Green Hydrogen Mission** will enhance industrial-scale deployment.
 - Establishing a **bilateral Green Energy Fund** can accelerate investments in **offshore wind, solar PV, and carbon capture technologies**.
- **Deepening Infrastructure and Connectivity Collaboration:** India must ensure **faster implementation of the India-Middle East-Europe Economic Corridor (IMEC)** by engaging France in **multi-modal logistics, smart port development, and digital trade facilitation**.
 - Encouraging French participation in **high-speed rail, metro, and sustainable urban infrastructure projects** will drive long-term investments.
 - Strengthening financial incentives for **French firms under India's Production Linked Incentive (PLI) scheme** will attract more **foreign direct investment (FDI)**.
- **Enhancing Space Cooperation for Strategic Autonomy:** India and France should co-develop **dual-use space technologies, satellite-based early warning systems, and secure communication networks** for strategic resilience.
 - Expanding collaboration under the **2047 Space Cooperation Roadmap**
 - Establishing a **Bilateral Space Security Forum** to counter **space weaponization and cyber threats to satellite networks** can ensure long-term cooperation.
 - Strengthening joint R&D in **earth observation, space situational awareness (SSA), and lunar exploration** will also elevate India-France space collaboration.
- **Strengthening Trade and Investment Facilitation:** India should push for **sector-specific market access agreements** in **pharmaceuticals, agribusiness, and high-end manufacturing** to balance trade asymmetries with France.
 - Encouraging **France-based venture capital firms** to invest in **India's deep-tech, semiconductors, and AI startups** will boost economic engagement.
 - Creating **joint innovation clusters** in **Bengaluru, Pune, and Paris** focusing on **AI, quantum computing, cybersecurity, and semiconductor fabrication** will drive technological synergies.
- **Expanding Educational and Mobility Agreements:** India should **expand dual-degree programs** with France's top universities, ensuring **credit transferability and simplified visa procedures** for Indian students.
 - Increasing funding for **joint research grants in AI, renewable energy, and biotechnology** will enhance academic ties.
 - Extending the **Young Professionals Scheme (YPS)** to mid-career professionals in **STEM, defence, and policy sectors** can deepen people-to-people engagement.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



What Role can France Play In Enhancing India-Europe Ties?

- **Bridging India-EU Free Trade Agreement (FTA) Negotiations:** France, as a key EU member, can mediate regulatory and trade standard alignments between India and the European Union.
 - By advocating for reduced tariffs, easing market access, and harmonizing digital and environmental policies, France can accelerate FTA finalization, unlocking billions in trade potential.
- **Strengthening India-Europe Connectivity via IMEC:** France's strategic port of Marseille can serve as a key hub in the India-Middle East-Europe Economic Corridor (IMEC).
 - By investing in multi-modal logistics, digital trade facilitation, and supply chain diversification, France can position itself as a critical transit point between India and the EU.
- **Facilitating India's Deeper Engagement with European Defence Networks:** France can act as India's entry point into European defence cooperation, particularly with OCCAR (Organisation for Joint Armament Cooperation).
 - Recently, Government of India has officially become the newest Observer State in the OCCAR-managed MALE RPAS (Eurodrone) programme
- **Strengthening Climate and Energy Partnerships in Europe:** France can champion India's renewable energy initiatives within Europe, encouraging more EU-based funding for India's solar, wind, and hydrogen projects.
 - By supporting technology transfer and green finance, France can position India as a preferred partner in EU's Green Deal frameworks.
- **Expanding India-Europe Digital and AI Cooperation:** France can help align India's data governance and AI policies with EU standards, ensuring smoother tech collaboration.
 - By integrating India's AI innovation ecosystem with European AI hubs, coordinating cybersecurity efforts, and promoting India-EU quantum computing research, France can drive a structured digital partnership.

Conclusion:

The Indo-French partnership is evolving into a comprehensive strategic alliance, underpinned by collaboration in defense, nuclear energy, AI, and space. As both nations navigate an uncertain global order, they

are leveraging their shared vision for multipolarity and technological sovereignty. Strengthening Indo-Pacific security, green energy investments, and AI governance can further solidify this partnership.



Growing Menace of Forest Fires in India

This editorial is based on "Addressing the growing threat of forest fires" which was published in The Hindu on 12/02/2025. The article brings into picture the tenfold surge in forest fires over two decades, causing ₹1.74 lakh crore in annual losses, with conservation efforts hindered by implementation gaps and climate change.

Tag: GS Paper - , GS Paper - 3, Conservation, Issues Relating to Development, Management of Social Sector/ Services, Forest Resources

Forest fires have emerged as a critical environmental challenge, with India witnessing a tenfold increase in incidents over the past two decades despite merely a 1.12% growth in forest cover. With over 36% of India's forest area prone to fires, the devastation extends beyond environmental damage to significant economic losses, estimated at ₹1.74 lakh crore annually. Despite progressive policies and constitutional safeguards, the implementation gaps in forest management, coupled with climate change impacts, continue to undermine India's forest conservation efforts.

Why Do Forest Fires Frequently Occur in India?

- **Climate Change and Rising Temperatures:** India's rising temperatures, prolonged dry spells, and erratic monsoon patterns have increased forest fire susceptibility.
 - Warming trends have led to drier forests, reducing moisture levels in vegetation, making them highly flammable.
 - Unseasonal heat waves in March-April, especially in Himalayan states, have intensified fire risks.
 - India recorded its hottest February in 2023 (IMD), impacting pre-monsoon soil moisture.
 - As a result, India State of Forest Report (ISFR) 2023, revealed that Uttarakhand alone experienced 5,351 forest fires between November 2022 and June 2023.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



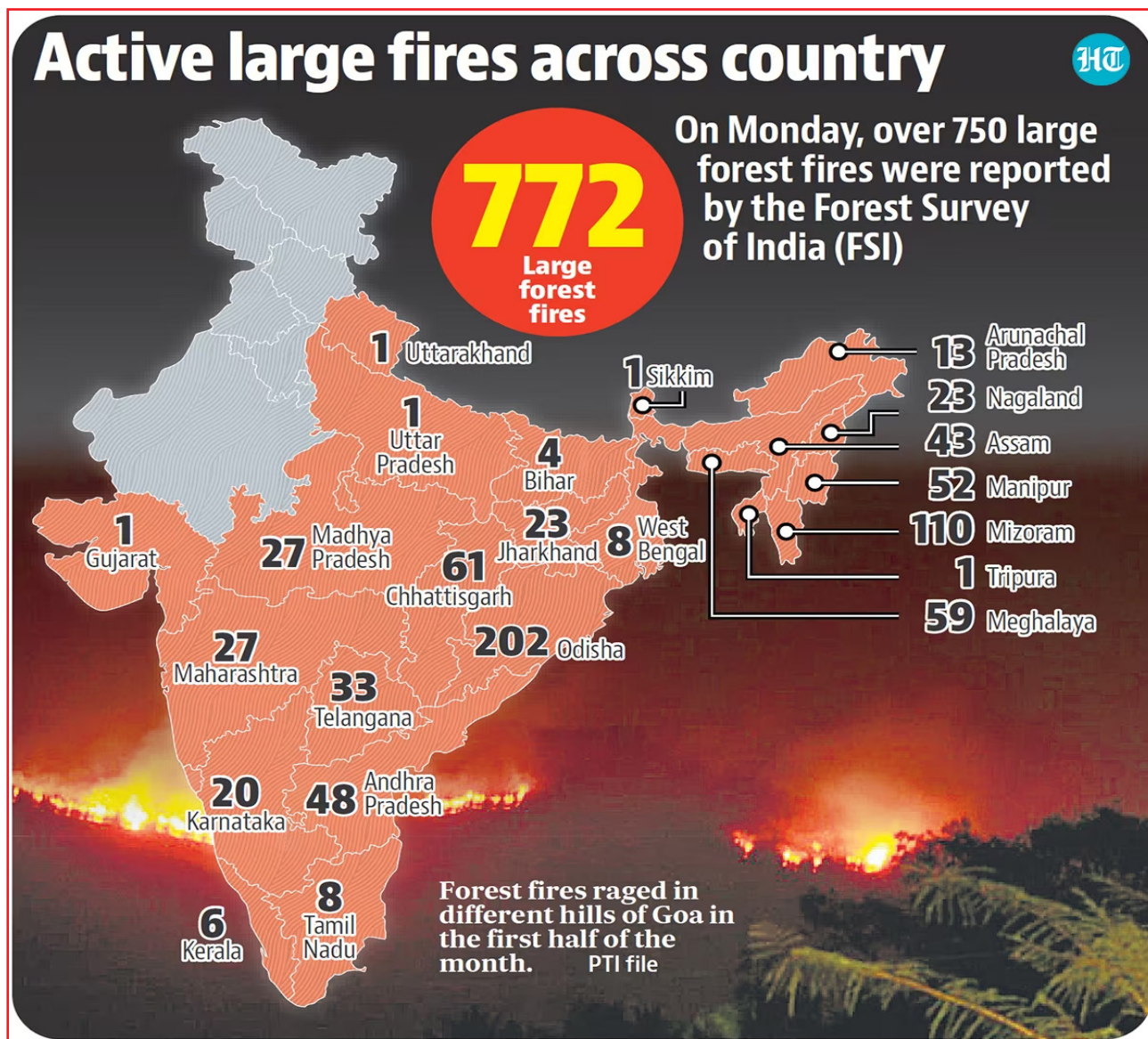
IAS Current
Affairs Module
Course



Drishti
Learning
App



- Also, climate change is making El Niño phenomena more common. **El Niño** years bring below-average rainfall, extending dry periods and intensifying fire risks.
- Erratic monsoons leave forests drier for longer, creating ideal conditions for wildfires.
- The 2023–2024 El Niño was regarded as one of the five strongest **El Niño–Southern Oscillation** event in recorded history
 - In 2024, the IMD reported a pre-monsoon rainfall deficit with shortages of 30% in the east and northeast and 68% in the south.



- **Human-Induced Causes and Encroachments:** Expanding agricultural frontiers and illicit land clearing contribute to frequent fires.
 - **Slash-and-burn techniques**, rampant in Northeast India, worsen fire outbreaks, particularly during dry seasons.
 - Infrastructure projects like roads and railways also escalate **accidental ignitions**.
 - WWF International in its 2020 report has estimated that humans are responsible for around **75% of all wildfires**.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course

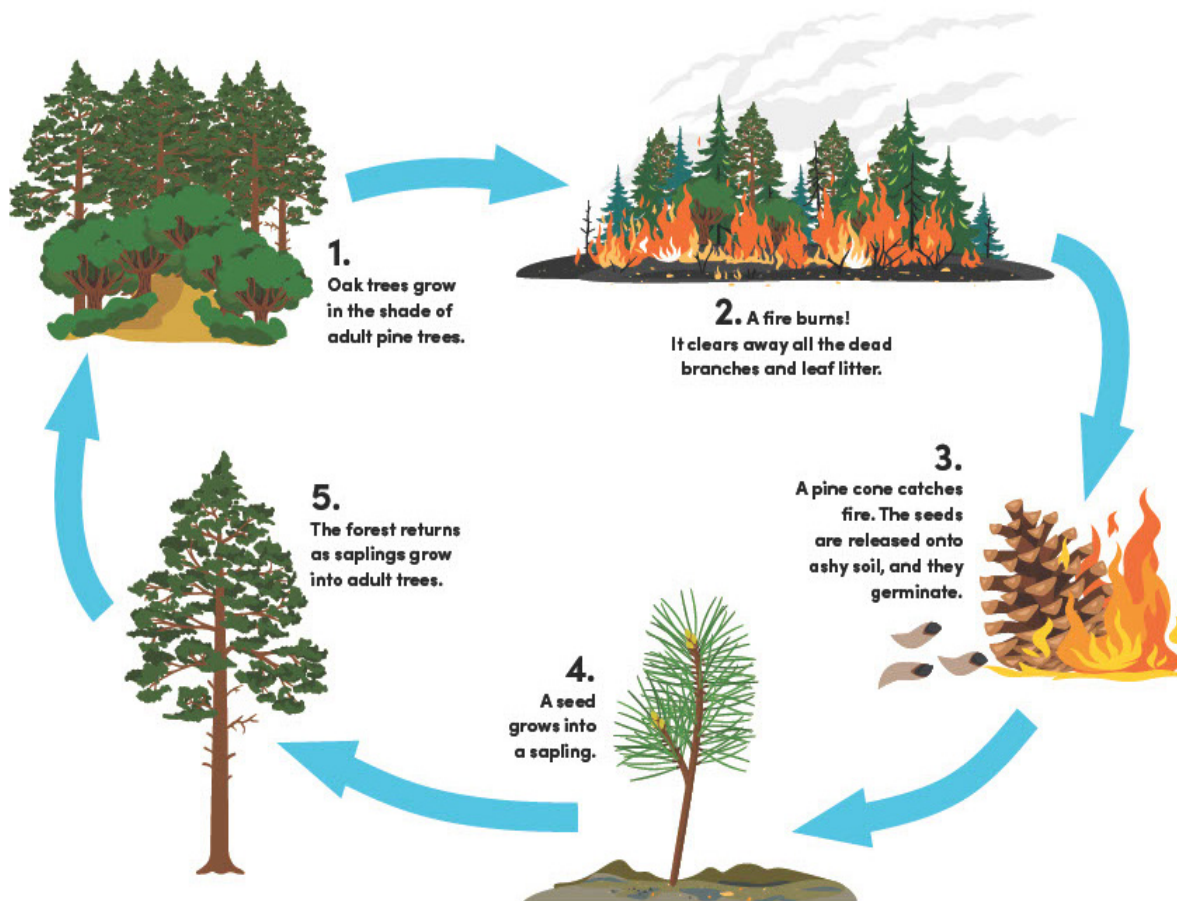


Drishti
Learning
App



- Increasing footfall in forested regions for tourism, **particularly in the Himalayas and Western Ghats**, has led to more accidental fires.
 - Pilgrimage routes like **Vaishno Devi** witness open fires due to improper waste disposal, escalating fire risks.
- **Deficient Early Warning and Fire Management Systems:** Inadequate fire surveillance, outdated response mechanisms, and weak enforcement of fire prevention laws exacerbate the crisis.
 - **Most state forest departments lack real-time monitoring** and rapid response teams.
 - As of 2019, the country had just **3,377 fire stations** as against the **8,559 required** with only minimal progress since then.
 - This is a pressing concern when **more than 60% of Indian states** are highly prone to forest fire events.
- **Biodiversity Hotspots and Flammable Vegetation:** India's vast biodiversity, especially in **dry deciduous and pine forests**, is highly fire-prone.
 - **Pine forests** in **Uttarakhand and Himachal Pradesh** shed resin-rich dry needles, acting as natural fuel.
 - For instance, forest fire in Himachal and in mid-Himalaya and lower belts may directly be correlated with **chir pine forests**.
 - **Grasslands and bamboo groves** in Central India also ignite easily during dry spells.

Pitch Pine Fire Cycle Diagram



Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Weak Community Participation and Awareness:** Many rural communities depend on forests for livelihoods but **lack awareness about fire risks and mitigation**.
 - Traditional fire control practices have declined, and incentives for fire prevention are weak.
 - **Lack of coordination between panchayats, forest officials, and local residents** worsens the situation.
- **Lack of Technological Integration in Fire Prevention:** Despite advances in satellite monitoring, India lacks AI-driven predictive fire models and real-time drone surveillance.
 - Current forest fire alerts are often delayed, preventing timely action.
 - The absence of weather-based fire forecasting further hampers preparedness.
 - **AI-based fire prediction models** are yet to be widely implemented beyond pilot projects (MoEFCC).

What are the Other Issues Related to Forests in India?

- **Deforestation Due to Infrastructure and Industrial Projects:** Large-scale infrastructure projects like **highways, railways, and mining** have led to massive forest loss.
 - Increasing **urbanization and industrial expansion** are causing fragmentation of forest ecosystems, **reducing wildlife corridors**.
 - Despite compensatory afforestation laws, forest land diversion continues unchecked.
 - According to **Global Forest Watch (GFW)**, India has lost 2.33 million hectares of tree cover since 2000, marking a 6% decline between 2001 and 2023.
 - Projects like the **Great Nicobar Project** involving diverting **130 square kilometres of forest**, to construct several developmental projects including a transshipment, have also come into the spotlight.
- **Depleting Forest Cover in Tribal and Scheduled Areas:** Tribal communities rely on forests for sustenance, but aggressive commercial plantations and encroachments are displacing them.
 - The **Forest Rights Act (FRA)** implementation **remains weak**, with many rightful claims rejected.

- Government afforestation programs often prioritize commercial species over native biodiversity.
 - Over 38% of all claims over land made under the Forest Rights Act (FRA), 2006 till **November 2022**, have been rejected.
- **Monoculture Plantations Impacting Natural Biodiversity:** Afforestation efforts are often focused on commercial monocultures like **eucalyptus, teak, or acacia**, which deplete groundwater and fail to support native biodiversity.
 - Such plantations do not compensate for the ecological value of lost natural forests, leading to biodiversity imbalances.
 - For instance, **Eucalyptus Plantations** have reduced groundwater levels by 20-30% in affected regions.
- **Human-Wildlife Conflict Due to Shrinking Habitats:** Rapid deforestation is forcing **wildlife into human settlements**, leading to an increase in conflicts, particularly with elephants, leopards, and tigers.
 - Expanding agricultural fields and highways through forests further escalates encounters, endangering both humans and animals.
 - For instance, between **2019 and 2024**, elephant attacks claimed **2,727 lives**, while tiger attacks resulted in 349 fatalities in India.
- **Forest Degradation Due to Unregulated Grazing:** **Overgrazing** by **livestock**, especially in fragile ecosystems, reduces regeneration capacity, compacts soil, and accelerates erosion.
 - **Traditional pastoral systems are collapsing**, leading to unsustainable grazing patterns that deplete forest biomass. Government policies often overlook sustainable grazing management.
 - As much as **77% of the country's livestock are herded or left to range on their own on common land by pastoralists**, per the September 2020 'Accounting for pastoralists in India' report.
- **Climate-Induced Shifts in Forest Ecosystems:** Rising temperatures and erratic monsoon patterns are altering **India's forest composition**, leading to species migration and ecosystem imbalances.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Alpine and tropical forests** are witnessing shifts in **flora and fauna**, impacting biodiversity and local livelihoods.
 - For instance, **oak forests** in the Himalayas are being replaced by **chir pine**.
- Also, West Bengal has lost **110 square kilometres of mangroves in the Sundarbans** in the past two decades due to climate change and global warming
- **Weak Implementation of Conservation Policies and Laws:** Despite strong legal frameworks, poor enforcement, bureaucratic delays, and political interference weaken conservation efforts.
 - Policies like **CAMPA** and **Green India Mission** have been criticized for inefficiency and fund misallocation.
 - Local communities often remain excluded from decision-making.
 - About **45% of funds allotted by the Centre for compulsory afforestation between 2017 and 2022** have not been utilized by the state.

What Measures can India adopt to Ensure Sustainable Forest Management?

- **Community-Led Fire Prevention and Control Mechanisms:** Empowering local communities through **Van Panchayats and Joint Forest Management Committees (JFMCs)** can enhance forest fire preparedness.
 - Training villagers in early detection, controlled burning techniques, and rapid response mechanisms will ensure timely action.
 - Incentivizing **local participation through ecotourism revenue sharing** can sustain these initiatives.

Example: **Uttarakhand's Van Panchayats** have successfully reduced fire incidents in select areas through community patrols and firebreaks.
- **Use of AI and Satellite-Based Early Warning Systems:** Deploying artificial intelligence (AI)-driven predictive models and real-time satellite monitoring can help detect fire-prone zones.
 - Drones equipped with thermal imaging can help assess fire risks and direct firefighting efforts.
 - Forest Survey of India (FSI) utilizes fire detection data from two satellite sensors: **MODIS (Moderate Resolution Imaging Spectroradiometer)** and **SNPP-VIIRS (Suomi National Polar-orbiting Partnership**

- **Visible Infrared Imaging Radiometer Suite**) to monitor forest fires across India, that can be further enhanced.
- **Fire-Resistant Afforestation and Green Firebreaks:** Shifting from **monoculture plantations to fire-resistant native species** can reduce forest fire susceptibility at prone areas.
 - Creating **green firebreaks—zones** with fire-resistant species like **sal, mahua, and jamun**—can prevent the spread of wildfires.
 - Also, broad-leaved trees like **oak and rhododendron** can help reduce the risk of forest fires.
 - Also, using **fungi-based mycelium barriers and bio-bricks** made from forest waste can create natural, fire-resistant zones.
 - These barriers decompose naturally while preventing fire spread in vulnerable regions. Integrating them with green firebreaks will enhance fire mitigation efforts.
- **Strengthening Forest Rights and Tribal Participation:** Recognizing and expediting **Forest Rights Act (FRA) claims** will empower tribal communities to sustainably manage forests.
 - Promoting **traditional knowledge-based conservation practices**, such as seed ball dispersal and water harvesting, will enhance forest resilience.
 - Direct benefit-sharing models from forest produce collection can create economic incentives for conservation.
 - **Odisha's Similipal Biosphere** has integrated tribal honey collectors into conservation efforts through cooperatives.
- **Transitioning to Climate-Resilient Forestry:** Integrating climate adaptation strategies, such as **selecting drought-tolerant native species** and restoring wetlands within forest landscapes, can enhance ecological resilience.
 - India's Carbon Credit Mechanism needs to be further refined to develop **forest-based carbon credit programs that can** attract investments for afforestation and conservation.
 - Aligning forest policies with **India's Net Zero targets** will ensure long-term sustainability.
 - **Meghalaya's Living Root Bridges ecosystem** is a brilliant example that aligns with natural climate resilience principles.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Banning Destructive Mining and Infrastructure in Eco-Sensitive Zones:** Strictly regulating mining, road expansion, and hydroelectric projects in fragile forest ecosystems will prevent irreversible damage.
 - Implementing **No-Go Zones** for mining and enforcing stricter **environmental impact assessments (EIAs)** will safeguard biodiversity.
 - Promoting eco-friendly alternatives, such as underground cabling instead of deforestation-heavy transmission lines, can mitigate damage.
 - In 2013, the Supreme Court asked the forest dwellers to decide if mining in **Niyamgiri hills** will affect their religious and cultural rights, **a significant step in involving forest communities.**
- **Integrating Agroforestry and Sustainable Forest-Based Livelihoods:** Promoting agroforestry models where **farmers grow trees alongside crops** can enhance tree cover without impacting food security.
 - Strengthening **Non-Timber Forest Produce (NTFP) value chains**, like medicinal plants and bamboo, can provide sustainable livelihoods.
 - Market linkages through initiatives like **Van Dhan Yojana** will ensure fair pricing and economic viability.
- **Enhancing Water Conservation in Forest Ecosystems:** Restoring **forest-based water bodies**, **reviving traditional rainwater harvesting structures**, and protecting riparian forests can strengthen hydrological cycles.
 - Encouraging catchment area treatment in deforested river basins will improve groundwater recharge.
 - Policies should integrate watershed management with afforestation projects for holistic forest health.
 - The **Aravalli Green Wall project** in Haryana is reviving **35,000 hectares of land** and restoring water bodies to combat desertification, can serve as a model.
- **Leveraging Sustainable Tourism for Conservation:** Regulating ecotourism through responsible tourism guidelines can generate revenue while protecting forests.
 - **Developing low-impact tourism infrastructure** and enforcing carrying capacity limits will reduce human disturbances.
 - Involving local communities in homestays and nature guide programs will ensure inclusive conservation efforts.
 - **Example: Kaziranga National Park** has successfully linked community-based ecotourism with conservation incentives.
- **Seed Bombing with Native and Climate-Resilient Species:** Drones can be used for aerial seed dispersal over degraded forests, improving afforestation efficiency.
 - Using indigenous seed varieties that require minimal water and are pest-resistant ensures better survival.
 - This technique is ideal for inaccessible or conflict-prone forest zones.
- **Forest-Based Blockchain for Transparent Conservation Funding:** Using blockchain to track afforestation and conservation funding can ensure accountability in tree plantation programs.
 - It will help **verify if afforestation commitments under CAMPA and CSR initiatives are actually implemented** on the ground.
 - Smart contracts can link funding to measurable outcomes like tree survival rates.
- **Artificial Fog Harvesting in Dry Forests:** Using fog nets to capture atmospheric moisture can provide water for forest regeneration in arid and semi-arid zones.
 - This is **particularly useful in regions where conventional water conservation methods are difficult.** Fog harvesting can be integrated with tree nurseries for improved seedling survival.
 - Tamil Nadu's coastal forests are experimenting with fog harvesting for afforestation efforts.

Conclusion:

India's escalating forest fire crisis underscores the urgent need for holistic and sustainable forest management. While climate change, human encroachments, and weak enforcement exacerbate fire risks, **solutions lie in community-driven conservation, AI-based early warning systems, fire-resistant afforestation, and stronger legal implementation.** Integrating traditional knowledge with modern technology, promoting eco-sensitive infrastructure, and aligning forest policies with India's climate goals will be crucial.



Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



Building a Secure and Prosperous Indian Ocean Region

This editorial is based on “[What India needs to do in the Indian Ocean](#)” which was published in The Indian Express on 15/02/2025. The article brings into focus the Indian Ocean’s strategic importance, once dominated by India but now contested by global powers. The Eighth Indian Ocean Conference highlights its growing geopolitical significance and India’s renewed maritime aspirations.

Tag: GS Paper - 1, Groupings & Agreements Involving India and/or Affecting India’s Interests, Bilateral Groupings & Agreements, India and its Neighbourhood

The **Indian Ocean**, deriving its name from **India’s millennia-old civilizational influence**, stands as a critical maritime artery handling **70% of global container traffic**. While India once dominated these waters in the first millennium, **leading to its economic supremacy**. But today, as global power shifts to the Indian Ocean Region, this body of water has become increasingly **contested**, with major powers including the **US, UK, France, and China vying for influence**. The ongoing **Eighth Indian Ocean Conference in Muscat**, bringing together foreign ministers from 30 countries, underscores the region’s growing **significance in global geopolitics and India’s renewed maritime aspirations**.



What are the Key Stakes of India in the Indian Ocean Region?

- **Economic Lifeline and Trade Dominance:** The Indian Ocean is India’s primary trade artery, carrying nearly **80% of its external trade and 90% of energy imports**.
 - In FY22, all key ports in India handled **720.29 million tonnes (MT) of cargo traffic**. India’s merchandise exports in FY23 were at **US\$ 451 billion**.
 - Ensuring free and secure sea lanes is vital for sustaining economic growth and energy security.
 - The government’s **Sagarmala Project** focuses on port-led development to boost exports and reduce logistics costs.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Geopolitical and Strategic Influence:** India seeks to counterbalance China's increasing naval presence and infrastructure projects in the **Indian Ocean Region (IOR)**, which threaten regional stability.
 - Through **SAGAR (Security and Growth for All in the Region)** and the **Indo-Pacific Oceans Initiative**, India is reinforcing its regional leadership.
 - Bilateral and multilateral partnerships, including **Quad**, **IORA**, **BIMSTEC**, and **ASEAN**, are central to maintaining influence.
 - Strengthening ties with key partners like Oman, Maldives, and Seychelles enhances India's strategic depth.
- **Maritime Security and Counterterrorism:** The Indian Ocean is a **hotspot for piracy, smuggling, and sea-based terrorism**, making maritime security a key priority.
 - India has strengthened naval capabilities through fleet modernization, increased patrols, and intelligence-sharing agreements.
 - The **Information Fusion Centre – Indian Ocean Region (IFC-IOR)** in Gurugram tracks maritime threats, enhancing regional security cooperation.
 - Indian Navy has deployed **Mission-Based Deployments (MBDs)** across **key choke points**, including the **Strait of Malacca**.



Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Energy Security and Blue Economy Expansion:** The Indian Ocean is critical for securing energy imports from the **Middle East** and expanding India's blue economy potential.
 - **Offshore energy exploration**, deep-sea mining, and marine biotechnology offer new growth opportunities.
 - India is investing in **offshore wind farms and hydrogen fuel production** to transition towards clean energy.
 - India's blue economy contributes **4% to GDP**. The **Deep Ocean Mission (MATYSA 6000)** aims to explore **polymetallic nodules** in the Central Indian Ocean Basin.
- **Infrastructure Development and Connectivity:** To strengthen its economic and strategic footprint, India is developing **critical infrastructure in the IOR**.
 - Projects like **Chabahar Port in Iran** and **Sittwe Port in Myanmar** enhance regional trade and connectivity.
 - Collaboration with **Japan and ASEAN** for **island development and smart ports** bolsters India's maritime logistics.
 - India is charting a course towards robust infrastructure development with a planned **USD 82 billion investment in port projects by 2035**.
- **Climate Change and Environmental Leadership:** As rising sea levels threaten coastal cities and island nations, **India is leading climate resilience efforts in the IOR**.
 - Initiatives like **Coalition for Disaster Resilient Infrastructure (CDRI)** and **International Solar Alliance (ISA)** promote sustainable development.
 - In June 2024, CDRI committed **\$8 million through its IRIS Programme** to strengthen disaster-resilient infrastructure in **Small Island Developing States (SIDS)**.
 - Strengthening climate diplomacy enhances India's credibility as a responsible ocean state.
 - The **Blue Flag certification** has been awarded to **12 Indian beaches**, promoting eco-friendly coastal tourism.

- **Cultural and Historical Ties Strengthening Soft Power:** India's historical maritime ties with **Southeast Asia, the Middle East, and Africa** position it as a natural leader in the IOR.
 - Shared civilizational links, including the **spread of Buddhism and ancient trade networks**, enhance India's soft power.
 - Cultural diplomacy through **Project Mausam** and naval goodwill missions fosters deeper regional engagement.
 - For instance, The **India-Africa Forum Summit (IAFS)** deepens cooperation with African nations, focusing on capacity building.
 - Also, India has emerged as a **leading advocate for the Global South**, representing the interests of numerous Indian Ocean nations.

What are the Key Strategic Concerns for India in the Indian Ocean Region?

- **China's Expanding Naval Presence and Encirclement Strategy:** China's increasing influence in the Indian Ocean through the **String of Pearls** strategy threatens India's maritime security and regional dominance.
 - **Chinese military bases, dual-use ports, and frequent naval patrols** in IOR challenge India's strategic autonomy.
 - The leasing of **Hambantota Port in Sri Lanka** and **Gwadar in Pakistan** provides Beijing a foothold near India's critical sea lanes.
 - China has **17 strategic port investments** in IOR, including **Djibouti's naval base** and **Ream Naval Base in Cambodia**.
 - In **2023**, Chinese research cum spy vessel **Shi Yan 6** docked in the Maldives, raising security concerns.
- **Maritime Security Threats: Piracy, Terrorism, and Illegal Activities:** The rise in **piracy, arms trafficking, and terrorism in the Indian Ocean** disrupts trade routes and threatens national security.
 - The **resurgence of Somali piracy** and Pakistan-based terror networks pose continuous risks.
 - Drug and human trafficking networks in the Arabian Sea undermine regional **stability and law enforcement capabilities**.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- The **Indian Navy** carried out **18 rescue operations in the Arabian Sea** from mid-December 2023 to March 2024 under its **Operation Sankalp**.
- Also, **unregulated fishing by foreign vessels**, including **Chinese deep-sea trawlers**, depletes India's marine resources.
- **Geopolitical Competition and Growing Foreign Military Presence:** The Indian Ocean is witnessing intense geopolitical competition, with the **US, China, UK, France, and Russia** increasing their naval deployments.
 - The growing presence of extra-regional powers, **US's Diego Garcia base** whereas Russia is **securing its first African naval base in Sudan**, gaining a crucial foothold in the Red Sea—one of the world's **busiest trade routes**.
 - The leasing of critical ports and infrastructure by foreign powers limits India's ability to shape regional security.
 - The **AUKUS Pact (2021)** is further strengthening Western presence in the Indo-Pacific, altering power dynamics in IOR.
- **Climate Change and Environmental Risks in the Indian Ocean:** Rising sea levels, frequent cyclones, and **coral reef degradation** threaten India's coastal security and marine economy.
 - Climate-induced displacement of populations from island nations like **Maldives and Seychelles** can lead to geopolitical instability.
 - The **Indian Ocean is among the fastest warming oceans**, with dire consequences for heat waves and extreme rain over the Indian subcontinent.
 - **Marine heat waves** are also a major concern now for corals and fisheries.
 - Also, the **2024 coral bleaching season in the Western Indian Ocean (WIO)** was severe due to **El Niño, positive Indian Ocean Dipole (IOD) phases**.
- **Weak Naval Infrastructure and Lagging Shipbuilding Capabilities:** India's naval modernization and **domestic shipbuilding industry** lag behind global standards, limiting its ability to project power in IOR.
 - The **reliance on foreign imports for advanced naval equipment**, including submarines and aircraft carriers, hampers operational readiness.

- Infrastructure bottlenecks at major Indian ports reduce efficiency in logistics and maritime trade.
- India ranks **20th in global shipbuilding with only a 0.06% share**, while China alone holds over 50%.
 - The annual shipbuilding output of Indian shipyards is only 0.072 million GT.
- **Cybersecurity Threats and Undersea Cable Vulnerability:** Subsea cables currently transmit more than 99% of the world's internet traffic.
 - The deployment of the **India Asia Xpress (IAX)** and **India Europe Xpress (IEX)** undersea cables marks a major advancement in India's connectivity with Asia and Europe.
 - It leaves highly vulnerable to **cyber threats**.
 - Increasing cyberattacks on India's maritime infrastructure, including ports and naval networks, highlight the need for stronger cybersecurity measures.
 - In 2021, **Recorded Future (Cybersecurity company)** observed an active '**handshake**' between a **China-linked group and an Indian maritime port**, with some connections still operational.

What are the Key Multilateral Groupings in the Indian Ocean that India is a part of?

- **Indian Ocean Rim Association (IORA):** Promotes regional cooperation in **maritime security, trade, blue economy, and disaster resilience**.
 - **India's Role:** Founding member, actively pushing initiatives in security, trade, and climate action.
- **Indian Ocean Naval Symposium (IONS)**
 - **Objective:** Strengthen maritime cooperation among navies of the Indian Ocean Region (IOR).
 - **India's Role:** Initiated by the **Indian Navy (2008)**; key player in joint exercises and information-sharing.
- **Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)**
 - **Objective:** Regional cooperation among Bay of Bengal littorals in security, trade, connectivity, and disaster management.
 - **India's Role:** Lead country in **security, transport connectivity, and energy cooperation**.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



➤ Colombo Security Conclave (CSC)

- **Objective:** Strengthen regional security cooperation in the Indian Ocean, focusing on counterterrorism, cyber threats, and HADR.
- **India's Role:** Founding member along with Sri Lanka and Maldives;

➤ Indo-Pacific Oceans Initiative (IPOI)

- **Objective:** Promote a **free, open, and rules-based maritime order** in the Indo-Pacific.
- **India's Role:** Launched by India (2019); leads efforts in maritime security and connectivity.

➤ Djibouti Code of Conduct (DCoC) & Jeddah Amendment

- **Objective:** Counter piracy, illegal fishing, and maritime crimes in the western Indian Ocean.
- **India's Role:** **Observer state**, supporting regional maritime security initiatives.

➤ QUAD (India-US-Japan-Australia)

- **Objective:** Ensure maritime security, freedom of navigation, and counter China's growing influence in the Indo-Pacific.
- **India's Role:** Active in joint **naval exercises (Malabar)** and infrastructure projects in IOR.

➤ ASEAN-India Maritime Cooperation

- It promote maritime transport cooperation between ASEAN and India, and encourage potential private sector participation in the development of seaports

What Measures can India Adopt to Strengthen its Influence in the Indian Ocean?

- **Expanding Naval and Maritime Capabilities:** India must accelerate its **blue-water navy expansion** by commissioning more aircraft carriers, nuclear submarines, and multi-role warships to project power effectively.
 - Strengthening **Mission-Based Deployments (MBDs)** in key chokepoints will enhance maritime domain awareness.
 - Developing **anti-access/area denial (A2/AD) capabilities** and undersea surveillance networks will counter external military threats.

- Investing in **AI-driven maritime intelligence** and cyber-resilient naval systems will ensure technological superiority.

- Strengthening **logistics agreements with regional partners** will allow sustained naval operations across the Indian Ocean Region (IOR).

➤ **Enhancing Indian-led Infrastructure Development:** India must lead the development of **strategic port infrastructure** under a co-development model to counter China's Belt and Road Initiative (BRI) through **Diamond of Necklace Strategy**.

- Strengthening projects like **Chabahar Port (Iran), Sabang Port (Indonesia), and Sittwe Port (Myanmar)** will enhance trade and connectivity.
- Upgrading **Indian ports like Kandla, Kochi, and Visakhapatnam** into transshipment hubs will boost India's maritime economy.
- Establishing **India-led special economic zones (SEZs) in island nations** will promote sustainable regional growth.

➤ **Deepening Regional Security Partnerships:** India must institutionalize **defense cooperation frameworks** like **India, France and UAE Maritime Partnership Exercise and Indo-Pacific QUAD (India, US, Japan, Australia)**.

- Expanding **defense exports of naval equipment and indigenous shipbuilding projects** will bolster regional self-reliance.
- Establishing **coastal radar networks** in partner nations will improve shared maritime domain awareness.
- Enhancing **humanitarian assistance and disaster relief (HADR) capabilities** will position India as a first responder in regional crises.

➤ **Strengthening Economic and Trade Diplomacy:** India must accelerate the development of **new trade corridors** in the Indian Ocean, such as the **India-Middle East-Europe Economic Corridor (IMEC)**.

- Developing **currency swap agreements and regional payment mechanisms** will reduce trade dependence on external currencies.
- Enhancing **blue economy cooperation** through joint ventures in **fisheries, ocean mining, offshore wind energy, and marine biotechnology** will create mutual economic benefits.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Promoting “**Make in India**” naval shipbuilding collaborations will support regional maritime industry growth.
 - Leveraging **BIMSTEC** and **IORA** for regional economic integration will strengthen India’s economic leadership.
- **Establishing a Strong Cyber and Digital Strategy:** India must invest in **secure undersea data cables, 5G expansion, and indigenous satellite-based navigation (NavIC)** to reduce dependence on foreign networks.
 - Expanding **digital public infrastructure (DPI)** projects like **Aadhaar, UPI (like in UAE), and CoWIN** in IOR nations will increase India’s technological influence.
 - Strengthening **cybersecurity frameworks** for **Indian ports, naval networks, and oil infrastructure** will protect against digital threats.
 - Collaborating with **ASEAN and Africa on data governance and AI cooperation** will create a regional digital ecosystem.
- **Strengthening Climate and Sustainable Development Leadership:** India must lead **green shipping corridors** and promote **decarbonization in maritime trade** to position itself as a sustainability leader.
 - Expanding **solar and wind energy projects** under the **International Solar Alliance (ISA)** will enhance regional energy security.
 - Developing **blue carbon initiatives like mangrove restoration and ocean conservation programs** will strengthen India’s ecological diplomacy.
 - Encouraging **marine-based ecotourism and sustainable fisheries management** will generate economic growth while preserving marine biodiversity.
- **Enhancing Soft Power and Cultural Diplomacy:** India must deepen **historical and civilizational ties** through **Project Mausam, Buddhist circuit diplomacy, and education scholarships** for IOR nations.
 - Strengthening **people-to-people ties through tourism, medical diplomacy, and student exchange programs** will enhance India’s regional goodwill.
 - Promoting **regional language broadcasting and digital outreach** via **DD India and Indian news agencies** will counter external narratives.
 - Expanding **cooperation in Ayurveda, yoga, and traditional medicine sectors** will strengthen India’s cultural influence.

Conclusion:

India’s strategic interests in the Indian Ocean are shaped by its historical maritime significance and its contemporary focus on security, trade, and regional cooperation. As the Indian Prime Minister emphasized on the 5-S framework—**Samman, Samvad, Sahyog, Samridhi, and Shanti**—as pillars of Indian diplomacy and through initiatives like **SAGAR and the Indo-Pacific Oceans Initiative**, India is poised to lead the region towards **greater stability, sustainability, and shared growth**, ensuring a balanced global order in the Indian Ocean.



Strengthening Indo-US Strategic Partnership

*This editorial is based on “**Foundation for layered India-America relations**” which was published in Hindustan Times on 17/02/2024. The article brings into picture the resilience of India-US ties, highlighting progress in defense, technology, and regional cooperation.*

Tag: GS Paper - 2, Bilateral Groupings & Agreements, Effect of Policies & Politics of Countries on India’s Interests, Indian Diaspora, Groupings & Agreements Involving India and/or Affecting India’s Interests

The recent **high-level diplomatic engagement between India and the United States** in Washington DC provided a moment of stability amid broader administrative turbulence. The bilateral meeting yielded substantive discussions across multiple sectors spanning technology, defense, energy, and regional cooperation. It demonstrated the **resilience of Indo-US ties despite shifting global dynamics**, particularly in critical areas like technology transfer and defense cooperation. However, significant challenges remain to be navigated, **especially regarding trade policies and broader geopolitical alignments**.

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

- **Defense and Security Cooperation:** India and the US have significantly expanded their defense ties, **moving from a buyer-seller relationship to co-production and technology sharing**.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- India's designation as a **Major Defense Partner (MDP)** and inclusion in **STA-1** facilitate high-tech defense trade, including potential access to **F-35 fighter jets**.
- The **"Autonomous Systems Industry Alliance (ASIA)"** and agreements between **Anduril-Mahindra and L3 Harris-Bharat Electronics** enhance AI-driven defense capabilities.
 - The **procurement of Javelin missiles and Stryker vehicles (2025)** and expanded **"Tiger Triumph"** tri-service exercises showcase growing interoperability.
- **Trade and Investment Ties:** Both countries aim to **double bilateral trade to \$500 billion by 2030**, addressing long-standing issues like market access, tariffs, and supply chain resilience.
 - The planned **Bilateral Trade Agreement (BTA) by 2025** will enhance **fair trade, reduce tariffs, and ease regulations**, particularly in **agriculture, ICT, and industrial goods**.
 - India has reduced **tariffs on bourbon, motorcycles, and ICT products**, while the US has improved access for **Indian mangoes, pomegranates, and pharma products**.
 - As many as 155 Indian companies have invested \$22 billion in the US, while US firms like **Tesla and Micron** expand in India.
- **Energy and Climate Cooperation:** Energy security is a major pillar of India-US ties, with the US becoming a top supplier of **crude oil, LNG, and petroleum products** to India.
 - The **US-India Energy Security Partnership (2025)** focuses on **hydrocarbon trade, renewables, and nuclear energy**, with India set to join the **International Energy Agency (IEA)** as a full member.
 - In **January-November 2024**: India imported **5.12 million tonne LNG** from US, **20% of overall LNG imports**.
- **Technology and Innovation Partnership:** Both nations are advancing cooperation in **AI, semiconductors, quantum, and biotech** under the **"U.S.-India TRUST" initiative (2025)**.
 - The **Recovery and Processing Initiative** strengthens collaboration in **lithium, rare earths, and critical minerals**, crucial for EVs and defense.
- The **INDUS Innovation (2025)** platform fosters private sector innovation, complementing **INDUS-X for defense tech collaboration**.
 - In 2023, Micron confirmed up to **\$825 million** investment in **chip facilities** in India.
- **Space Collaboration:** India and the US are strengthening space collaboration with **NASA-ISRO partnerships** in **human spaceflight and planetary exploration**.
 - The **NISAR satellite (2024)** will map Earth's surface changes, aiding climate resilience.
 - The **NASA-ISRO AXIOM mission-4 (2025)** will send the **first Indian astronaut to the International Space Station (ISS)**.
 - India's entry into the **Artemis Accords (2023)** with NASA underlines deepening ties.
 - The US is also supporting India's **Gaganyaan** human spaceflight mission.
- **Strategic Indo-Pacific Cooperation:** As key Quad partners, India and the US are committed to a **free, open, and rules-based Indo-Pacific**, countering China's assertiveness.
 - Quad initiatives on **shared airlift capacity to support civilian response** to natural disasters and maritime patrols to improve interoperability is **acquiring global attention**.
 - **Quad Critical and Emerging Tech Group** promote **infrastructure, trade, and digital connectivity**.
 - India's full membership of the multinational **US-led Combined Maritime Forces (CMF)**, announced in November 2023, represents a step change in India-US ties.
- **People-to-People and Educational Ties:** The Indian-American community, which has grown to **5 million in 2023**, has broken through many barriers to become one of the most influential immigrant groups.
 - With more than **3.3 lakh Indian students in the US (2024)** contributing significantly to its economy, education is a cornerstone of bilateral ties.
 - The **India-US Working Group on Education & Skill Development** is promoting **dual degrees, joint research, and faculty exchanges**.
 - **IIT Council and Association of American Universities** signed MoU in 2023 to set up Indo-US Global Challenges Institute.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



What are the Key Areas of Friction Between India and the US?

- **Trade Disputes and Tariff Barriers:** Despite progress, trade imbalances and tariff disputes remain contentious.
 - The US has long criticized India's **high tariffs on agricultural and industrial products**, while India resents **non-tariff barriers on pharmaceuticals and IT services**.
 - In 2018, when the **U.S. imposed taxes on steel and aluminium**, India retaliated by raising tariffs on **29 U.S. products**.
 - The **U.S. goods trade deficit with India rose by 5.4% to \$45.7 billion in 2024**, a growing concern for Washington over trade imbalances.
- **Defense Technology and Export Control Restrictions:** Despite growing defense ties, US export controls limit **technology transfer** and co-development.
 - India seeks **fifth-generation fighter jets and advanced undersea systems**, but the US restricts access (though under review).
 - The **Reciprocal Defense Procurement (RDP) agreement (2025)** aims to address regulatory misalignments.
 - While India was granted **STA-1 status (2018)**, it still struggles with restrictions on **AI, drone, and missile technologies**.
- **Differences Over China Policy and Strategic Autonomy:** While both nations share concerns over China's **aggression in the Indo-Pacific**, their strategic approaches differ.
 - The US wants India to **align more closely with Western security frameworks**, but India maintains **non-alignment and independent foreign policy**.
 - The Quad's military potential is somewhat hampered by India's reluctance to join a treaty-based security alliance.
 - India's **participation in BRICS and the SCO** creates discomfort in Washington, as it engages with **China and Russia simultaneously**.
- **Visa and Immigration Restrictions for Indian Professionals:** Despite strong educational and professional ties, **visa restrictions and work permit issues** continue to create friction.
 - The **H-1B visa program**, critical for India's IT sector, faces **quotas, delays, and restrictions on extensions**.
 - The demand for US green cards remains high among Indians, yet a substantial backlog and strict annual caps slow progress.
- **Lack of Progress on Civil Nuclear Cooperation:** Despite the landmark **US-India Civil Nuclear Agreement (2008)**, nuclear cooperation has stalled due to **liability concerns and regulatory hurdles**.
 - The US wants India to **amend the Civil Liability for Nuclear Damage Act (CLNDA)** to protect suppliers from excessive liability.
 - But only recently in **Union Budget 2025** India planned to amend the **Atomic Energy Act and the Civil Liability for Nuclear Damage Act** to develop 100 GW of nuclear energy by 2047.
- **Digital Trade and Data Localization Issues:** The US opposes India's **data localization mandates**, arguing they hurt **US tech firms like Google, Amazon, and Meta**.
 - India, on the other hand, insists on **data sovereignty** to protect user privacy and national security.
 - The **Digital Personal Data Protection Act (2023)** mandates **local storage of sensitive data**, affecting cross-border data flows.
 - The US also objects to India's **antitrust probes into Big Tech**, including recent cases against **Google and Apple** for market dominance.
- **Divergences on Multilateral Platforms and Global Governance:** Despite US support for India's **permanent UNSC membership**, differences persist over **global governance approaches**.
 - The US wants India to take a **stronger anti-Russia stance at the UN**, but India maintains a **neutral position**. India has abstained from **UNGA votes condemning Russia's Ukraine invasion**, despite US pressure.
 - The **WTO disputes over agricultural subsidies** also strain ties, with the US opposing India's **Minimum Support Price (MSP) policy**.
 - The newly elected US President has threatened to impose high tariffs on **BRICS nations, including India**, citing **trade imbalances and unfair practices**.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



What Measures India Can Adopt to Further Enhance Ties with the US?

- **Strengthening Defense Co-Development and Industrial Collaboration:** India should push for **greater technology transfer, joint production, and co-development** under initiatives like the **India-US Defense Industrial Cooperation Roadmap**.
 - Expediting agreements like the **Reciprocal Defense Procurement (RDP) pact** can streamline arms procurement and interoperability.
 - Expanding **joint AI, drone, and undersea warfare projects** will enhance defense synergies.
 - Boosting **private-sector participation in defense manufacturing** will make India a stronger strategic partner.
- **Addressing Trade Barriers and Expanding Bilateral Agreements:** India should work towards **finalizing the Bilateral Trade Agreement (BTA)** to reduce tariffs, non-tariff barriers, and trade disputes.
 - Enhancing **market access for US firms in retail, agriculture, and digital sectors** while securing **preferential treatment for Indian exports** will improve trade balance.
 - Strengthening **supply chain integration in semiconductors, critical minerals, and pharmaceuticals** can mitigate geopolitical risks.
 - India should leverage **regional trade frameworks like IPEF** to enhance economic collaboration.
 - Aligning **intellectual property rights (IPR) and regulatory standards** with US norms can facilitate smoother trade.
- **Deepening Energy and Climate Cooperation:** India should **expand long-term energy deals** with the US to secure **LNG, crude oil, and strategic petroleum reserves**.
 - Strengthening partnerships in **renewable energy, green hydrogen, and energy storage** will align with global sustainability goals.
 - Joint development of **small modular reactors (SMRs) and civil nuclear projects** can boost India's nuclear energy capacity.
- Collaborating on **carbon capture, battery technology, and electric mobility** will support India's clean energy transition.
- **Advancing Technology and Innovation Partnerships:** India should accelerate **joint R&D and co-development** in **AI, semiconductors, quantum computing, biotech, and space technologies** under the **US-India TRUST initiative**.
 - Expanding the **INDUS-X and INDUS Innovation platforms** will foster deeper defense-tech collaboration.
 - Strengthening **trusted digital supply chains and relaxing data localization norms selectively** can attract US tech investments.
 - Facilitating **US venture capital participation** in Indian tech startups will drive innovation growth.
 - Joint production of **next-generation telecom and 5G/6G infrastructure** can strengthen technological ties.
- **Enhancing Strategic and Indo-Pacific Cooperation:** India should **expand maritime and intelligence cooperation** in the **Indo-Pacific and Indian Ocean Region**.
 - Expanding **defense infrastructure projects in Southeast Asia** with US backing can counter regional security threats.
 - Aligning cyber and space security policies under **US-India strategic dialogues** will improve security cooperation.
 - Enhancing **collaboration on economic corridors like IMEC** will strengthen regional connectivity.
- **Reforming Immigration and Mobility Frameworks:** India should negotiate for **higher H-1B visa caps, Green Card relaxations, and streamlined work permits** for Indian professionals.
 - Establishing **dual-degree programs and university collaborations** can enhance knowledge exchange.
 - Strengthening **mutual recognition of professional qualifications** will boost skilled workforce mobility.
 - Ensuring **faster visa processing and reducing work permit restrictions** will benefit Indian students and professionals.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Expanding Multilateral and Global Governance Engagement:** India should seek stronger US backing for **permanent UNSC membership and leadership roles in global institutions**.
 - Aligning **global trade policies within WTO frameworks** will reduce trade frictions.
 - Coordinating on **counterterrorism, cybersecurity, and nuclear non-proliferation** will enhance strategic alignment.
 - Strengthening cooperation on **global health security and pandemic preparedness** can deepen diplomatic ties.
 - Engaging in **plurilateral groupings like Quad, I2U2, and IPEF** can reinforce India's global influence.
- **Strengthening Digital and Data Governance Cooperation:** India should work on **harmonizing data privacy regulations** with US standards to ease digital trade restrictions.
 - Encouraging **US tech firms to set up R&D hubs and semiconductor fabs** in India will enhance investment flows.
 - Aligning **cybersecurity frameworks and AI governance policies** can improve trust in emerging tech collaboration.
 - Developing **joint frameworks for fintech regulation** can expand digital financial services.
- **Resolving Bilateral Differences Through Diplomatic Engagement:** India should institutionalize **high-level strategic dialogues** to proactively resolve trade, security, and human rights differences.
 - Strengthening **Track 1.5 and Track 2 diplomatic channels** will ensure consistent communication.
 - Expanding **legislative and subnational cooperation between US states and Indian states** can enhance local partnerships.
 - Engaging **think tanks and industry groups** to shape policy recommendations will improve bilateral understanding.
 - Promoting **cultural and diaspora diplomacy (through Cricket diplomacy as observed in T20 World Cup 2024)** will reinforce mutual goodwill.

What are the Key Groupings that India and the US Are Part of?

- **Quad (Quadrilateral Security Dialogue):** Strategic partnership with **Japan and Australia** to ensure a **free, open, and rules-based Indo-Pacific**.
- **I2U2 (India-Israel-UAE-USA):** Focuses on **economic cooperation, infrastructure, food security, and clean energy** in the Middle East.
- **Indo-Pacific Economic Framework (IPEF):** A US-led initiative for **trade, supply chains, clean energy, and anti-corruption**, with India joining three of its four pillars.
- **G20:** A global economic forum where India and the US collaborate on **climate action, digital economy, and global financial stability**.
- **Financial Action Task Force (FATF):** Both nations cooperate on **counterterrorism financing and anti-money laundering efforts**.
- **Global Biofuels Alliance (GBA):** Joint efforts for **sustainable energy transition and biofuel adoption**.
- **Artemis Accords:** Space exploration cooperation under **NASA's lunar and deep-space missions**.

Conclusion:

The recent high-level engagement between India and the US underscores the resilience of their **strategic partnership amid global uncertainties**. While significant progress has been made in **defense, trade, technology, and energy cooperation**, key challenges—such as trade barriers, strategic autonomy concerns, and regulatory hurdles—persist. Strengthening institutional frameworks, fostering co-development in emerging technologies, and addressing trade imbalances will be crucial in unlocking the full potential of this partnership.



Reforming India's Disaster Strategy

This editorial is based on "[Bill to amend Disaster Management Act: a proposed solution involving the States](#)" which was published in The Hindu on 18/02/2025. The article brings into picture the growing tensions between the Centre and states over disaster relief funding, highlighting delays and inadequate allocations. It underscores the need for a transparent, equitable, and depoliticized disaster management framework to ensure timely recovery.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



Tag: GS Paper - 2, Important International Institutions, GS Paper - 3, Disaster Management, Environmental Impact Assessment (EIA), Environmental Pollution & Degradation

India's disaster relief funding system has become a point of contention between the Centre and states, as seen in Tamil Nadu's recent struggle for adequate **National Disaster Response Force** assistance post-cyclone. While states face rising climate-induced disasters, delays and insufficient allocations from the **SDRF** and **NDRF** hinder timely recovery efforts. Legislative proposals like the **Disaster Management (Amendment) Bill, 2024** aim to enhance transparency and ensure proportional state representation in decision-making. As extreme weather events escalate, India urgently needs a resilient and depoliticized disaster management system.

What are the Key Disaster Threats India is Facing?

- **Increasing Frequency of Extreme Weather Events:** India is witnessing a surge in climate-induced disasters such as cyclones, floods, and heatwaves, driven by rising global temperatures and erratic monsoon patterns.
 - The warming of the Indian Ocean is intensifying cyclones, while shifting monsoon trends are causing unpredictable droughts and floods.
 - **Cyclone Michaung (2023)** caused ₹37,000 crore losses in Tamil Nadu; **2023 floods** in Himachal Pradesh led to ₹10,000 crore damage.
 - India reported 2,227 casualties due to extreme weather events in 2022 (IMD, 2024).
- **Urban Flooding Due to Poor Infrastructure:** Unplanned urbanization, clogged drainage systems, and disappearing wetlands have turned seasonal rains into devastating urban floods.
 - Cities like Delhi, Chennai, and Bengaluru face severe water logging due to concretization and poor stormwater management.
 - For instance, Delhi recorded its highest single-day rainfall (153 mm) in 41 years in July 2023, leading to Yamuna flooding and widespread traffic disruption.
 - In 2022, Bengaluru suffered a loss of Rs 2.25 billion due to flooding.

- **Droughts and Water Scarcity Affecting Agriculture:** Erratic monsoons, rising temperatures, and groundwater depletion are making droughts more frequent and severe.
 - India's over-reliance on monsoon-dependent farming makes its food security highly vulnerable.
 - Inefficient irrigation practices and delays in implementing climate-resilient agriculture are compounding the crisis.
 - **Indian Meteorological Department** declared 2023's August as the driest in 122 years, severely impacting Kharif crop yields.
 - Also, according to a recent estimate by the World Wide Fund for Nature, 30 Indian towns would face a "severe water risk" by 2050.
- **Himalayan Glacial Melting and Flash Floods:** Rising global temperatures are accelerating glacier retreat in the Himalayas, increasing the risk of Glacial Lake Outburst Floods (GLOFs) and landslides.
 - Infrastructure projects like hydropower dams and highways in fragile Himalayan regions worsen the situation.
 - The absence of early warning systems and disaster-resilient infrastructure leads to significant human and economic losses.
 - In October 2023, a Glacial Lake Outburst Flood (GLOF) from North Sikkim's South Lhonak Lake burst, leading to widespread destruction.
- **Rising Sea Levels and Coastal Erosion:** India's 7,500 km coastline is increasingly vulnerable to rising sea levels, coastal erosion, and saline water intrusion.
 - Unchecked sand mining, port expansion, and mangrove destruction are worsening the situation.
 - Despite India's Climate Action Plan, coastal resilience efforts remain slow.
 - According to a study by National Centre for Coastal Research, (NCCR), about 33.6% of the coast is eroding.
- **Earthquakes in High-Risk Zones:** India sits on multiple seismic zones, making northern and northeastern states highly earthquake-prone.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Poor enforcement of **building codes** and outdated infrastructure increase the disaster impact.
 - The **lack of retrofitting policies** for old buildings and critical infrastructure makes earthquake preparedness weak.
- The **6.4 magnitude Assam earthquake (2021)** caused widespread structural damage.
 - Recent **tremors in Delhi-NCR**, with a potential epicenter near Dhaula Kuan, highlight growing seismic threats.
- **Industrial and Chemical Disasters:** Rapid industrial expansion without stringent **safety compliance** is increasing **chemical disasters and gas leaks**.
 - Poor regulatory oversight and outdated technology in hazardous industries amplify risks.
 - The **Vizag LG Polymers gas leak led to many casualties**. **Delhi's Mundka factory fire (2022)**, highlighting poor industrial safety standards.
- **Biological Disasters and Public Health Crises:** Pandemics, zoonotic diseases, and antimicrobial resistance pose **long-term disaster risks**.
 - Rising pollution, deforestation, and climate change are increasing the frequency of **vector-borne diseases**.
 - The **Covid-19 pandemic** exposed gaps in India's **healthcare infrastructure**, underscoring the need for **stronger disease surveillance**.
 - India has been **identified as a hotspot of emerging antibiotic resistance** owing to excessive use to antibiotics in both domestic animals and humans

What are the Key Structural Issues in India's Disaster Management Strategy?

- **Overcentralization and Delayed Fund Disbursal:** India's disaster management remains highly **centralized**, with states dependent on the **National Disaster Response Fund (NDRF)**, leading to delays and inefficiencies.
 - States often struggle with **inadequate State Disaster Response Fund (SDRF) allocations**, limiting their capacity for **timely relief and rehabilitation**.
 - Tamil Nadu has recently urged the Union government to release **₹6,675 crore under the National Disaster Response Fund (NDRF)** so that the State can carry out the relief and restoration work required after **Cyclone Fengal**.
- **Weak Local Governance and Implementation Gaps:** Despite the **Disaster Management Act, 2005**, local authorities remain **underfunded and lack decision-making power**, making disaster response slow and ineffective.
 - Many districts have **inactive or non-functional District Disaster Management Authorities (DDMAs)** due to lack of **trained personnel and technical capacity**.
 - Even **disaster-prone states** lack proper **risk assessment and preparedness plans** at the grassroots level.
 - During the **2023 Himachal Pradesh floods**, lack of district-level coordination led to **slow relief operations, delaying aid for thousands**.
- **Outdated Early Warning Systems and Poor Forecasting:** India's **early warning systems (EWS)** suffer from **technological gaps, poor last-mile connectivity, and inaccurate forecasting**, leading to **delayed evacuations and higher casualties**.
 - While **IMD issues warnings**, they are often **not specific or localized enough**, making it difficult for authorities to **take timely preventive measures**.
 - Many **rural and tribal communities** remain out of reach of **real-time alerts**, increasing their vulnerability.
 - **Infrastructural limitations**, such as **insufficient Doppler radar coverage**, further weaken prediction capabilities.
 - The **South Lhonak Lake GLOF in Sikkim (2023)** had **no proper early warning system**, leading to **many casualties and massive infrastructure loss**.
 - Also, an estimated **72% of districts in India** are exposed to extreme flood events but **only 25% of them have level flood forecasting stations**
- **Inadequate Urban Planning and Infrastructure Resilience:** Rapid, unplanned urbanization has made cities **highly vulnerable to flooding, earthquakes, and heatwaves**, with **weak building codes and poor drainage systems** worsening disasters.
 - **Retrofitting of old structures** remains neglected, increasing the risk of casualties during disasters like earthquakes.
 - Poor enforcement of the **National Building Code (NBC), 2016**, allows developers to ignore disaster-resistant construction standards.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- A recent study found that over 80% of Delhi's buildings are vulnerable to a major earthquake due to poor adherence to NBC guidelines.
- **Insufficient Community Awareness and Preparedness:** Despite India's high disaster vulnerability, **public awareness about disaster preparedness remains low**, especially in rural and marginalized communities.
 - Lack of **disaster drills, education programs, and evacuation training** leads to high casualties and inefficient crisis response.
 - The **absence of inclusive disaster policies** means that **vulnerable groups—women, elderly, disabled people—are often left out of preparedness plans.**
- **Limited Use of Technology and Innovation:** India's disaster management relies heavily on **traditional response mechanisms**, with **slow adoption of AI, remote sensing, and GIS mapping** for disaster prediction and relief.
 - Blockchain and satellite imagery could enhance real-time damage assessment and faster fund disbursement, but implementation remains limited.
 - Lack of **inter-agency data sharing and integration of smart technologies** weakens **decision-making and coordination.**
 - While countries like **Japan use AI-based tsunami prediction models**, India's coastal EWS still relies on conventional sensors.
- **Fragmented Disaster Health Management:** Disaster-hit areas often face **severe shortages of emergency medical facilities, trauma care centers, and trained healthcare professionals**, worsening post-disaster mortality.
 - Many state disaster plans **lack dedicated public health response strategies**, making them **reactive rather than preventive.**
 - **Heatwaves, pandemics, and chemical disasters** require specialized healthcare responses, but coordination between **NDMA and the Health Ministry remains weak.**
 - Mobile hospitals and **telemedicine solutions** are underutilized in disaster-affected regions.
 - During the **2024 Odisha heatwave**, over **26 lives were lost in 24 hours**, with many hospitals lacking adequate emergency cooling facilities.

What Measures to Strengthen India's Disaster Management System?

- **Decentralized Disaster Governance and Fund Allocation:** Empower **State and District Disaster Management Authorities (SDMAs & DDMAs)** with **autonomy in fund utilization** to ensure faster response.
 - Establish a **formula-based, impact-driven NDRF allocation** mechanism to avoid political interference and delays.
 - Strengthen **local governance frameworks** by integrating disaster risk reduction (DRR) into **Panchayati Raj Institutions (PRIs)** and urban local bodies (ULBs).
 - Increase **flexibility in SDRF utilization** to allow states to respond to evolving disaster risks.
- **Strengthening Early Warning Systems and Real-Time Monitoring:** Upgrade **Doppler radar networks, satellite imaging, and AI-based predictive analytics** to enhance **localized and accurate forecasting.**
 - Implement **automated alert systems via SMS, social media, and mobile networks** for last-mile connectivity, especially in rural and tribal regions.
 - Develop a **multi-hazard early warning system (MHEWS)** covering floods, cyclones, earthquakes, and heatwaves in an integrated manner.
 - Promote **community-based early warning dissemination** through local volunteer networks.
- **Climate-Resilient Infrastructure and Urban Planning Reforms:** Implement **strict enforcement of the National Building Code (NBC), 2016**, ensuring all new constructions are **earthquake, flood, and cyclone-resistant.**
 - Promote **nature-based solutions** like **wetland restoration, mangrove plantations, and permeable urban surfaces** to mitigate urban flooding.
 - Mandate **risk-sensitive land-use planning** by integrating **disaster vulnerability assessments** into Smart City and AMRUT projects.
 - Encourage **disaster-resilient retrofitting of old buildings, bridges, and dams**, especially in seismic zones.
 - Introduce **green infrastructure incentives** to promote **sustainable urbanization.**

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Enhancing Community Awareness and Disaster Preparedness:** Integrate disaster risk education into school and university curricula to foster a culture of preparedness.
 - Conduct **regular disaster drills, mock evacuations, and awareness campaigns** at community and workplace levels.
 - Strengthen **Self Help Groups (SHGs)**, local NGOs, and citizen response teams to act as first responders in disaster-prone regions.
 - Use **vernacular media, traditional knowledge systems, and digital outreach** for more effective risk communication.
- **Leveraging Technology and Innovation for Disaster Management:** Expand the use of AI, blockchain, and GIS-based decision support systems for real-time disaster risk assessment.
 - Deploy **IoT-based smart sensors** in dams, bridges, and landslide-prone areas to detect early signs of failure.
 - Strengthen **drone-based disaster mapping and emergency supply delivery** for faster relief operations.
 - Develop **integrated disaster management mobile applications** that provide real-time alerts, evacuation routes, and emergency contacts.
- **Strengthening Healthcare and Post-Disaster Response Mechanisms:** Establish mobile emergency hospitals and rapid medical response teams in disaster hotspots.
 - Equip **primary health centers (PHCs) and district hospitals** with heatwave, flood, and pandemic preparedness protocols.
 - Train **paramedics, ASHA workers, and disaster volunteers** in mass casualty management and psychological first aid.
 - Stockpile **emergency medical supplies, vaccines, and portable diagnostic tools** for quicker post-disaster interventions.
- **Institutional Reforms and Inter-Agency Coordination:** Enhance coordination between IMD, ISRO, NDMA, and NDRF through a unified **National Emergency Coordination Hub (NECH)**.
 - Train **bureaucrats, first responders, and law enforcement personnel** in modern disaster response protocols.
 - Promote **inter-ministerial collaboration** for synchronized climate adaptation and disaster risk reduction efforts.
 - Ensure **real-time intelligence sharing** among scientific institutions, disaster response forces, and local governments.
- **Strengthening Financial Resilience and Disaster Insurance Mechanisms:** Expand state-level catastrophe risk insurance schemes to cover crop loss, property damage, and livelihood disruptions.
 - Develop **parametric insurance models** to provide **automatic compensation** based on predefined disaster triggers.
 - Encourage **corporate social responsibility (CSR) funds** for disaster risk reduction projects.
 - Establish a **dedicated National Resilience Fund (NRF)** to support climate adaptation and pre-disaster mitigation strategies.
 - Incentivize **micro-insurance programs** for **vulnerable communities**, reducing post-disaster economic shocks.
- **Promoting Nature-Based Solutions and Ecosystem Restoration:** Implement large-scale afforestation and wetland conservation projects to enhance natural flood control and climate resilience.
 - Strengthen **coastal zone management** by restoring mangroves, coral reefs, and sand dunes to protect against storm surges and erosion.
 - Promote **sustainable agriculture and water conservation** to mitigate drought risks.
 - Integrate **disaster resilience** into **MGNREGA** and **Jal Shakti Abhiyan** for long-term ecological sustainability.
- **Ensuring Faster Rehabilitation and Livelihood Recovery:** Develop pre-approved disaster recovery frameworks to streamline post-disaster reconstruction efforts.
 - Strengthen **livelihood diversification programs** to help disaster-affected populations regain economic stability.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Implement **fast-track housing reconstruction schemes** with climate-resilient designs in disaster-prone areas.
- Establish **psycho-social support programs** to help trauma-affected survivors recover faster.
 - Promote **local entrepreneurship and vocational training** to rebuild economies in disaster-hit regions.

Conclusion:

India's disaster management system must evolve into a decentralized, technology-driven, and climate-resilient framework to address escalating threats. Strengthening early warning systems, community preparedness, and sustainable infrastructure is crucial for reducing disaster impacts. The **Sendai Framework for Disaster Risk Reduction (2015-2030)** emphasizes a proactive approach, focusing on **risk mitigation, resilient recovery, and inclusive governance**.



Make in India, Make for the World

This editorial is based on "Making in India for the world" which was published in The Hindu on 17/02/2025. The article highlights India's transformation from post-colonial scarcity to a global manufacturing hub, driven by policy reforms, a skilled workforce, and technological advancements.

Tag: GS Paper - 2, Government Policies & Interventions, GS Paper - 3, Industrial Growth, Industrial Policy

India's journey from post-colonial scarcity to a **global manufacturing hub** reflects its **economic resilience** and **policy-driven growth**. With a skilled workforce, technological advancements, and pro-business reforms, the country offers a thriving ecosystem for industries. Initiatives like the **National Manufacturing Mission** are boosting infrastructure, workforce development, and MSME growth. As India strengthens its manufacturing base, it is poised to **serve both domestic and global markets efficiently**. **Make in India, Make for the World!**

What are the Key Factors Driving India as a Global Manufacturing Hub?

- **Policy Reforms and Ease of Doing Business:** The Indian government has introduced several policy reforms to enhance manufacturing competitiveness.
 - The **Production-Linked Incentive (PLI) scheme** across 14 sectors, reduction in corporate tax rates (15% for new manufacturing units.), and streamlined regulatory processes have created a business-friendly environment.
 - Additionally, India's proactive approach in trade agreements, such as **India-UAE CEPA** and **India-Australia ECTA**, has improved market access.
 - As a result India jumped to **63rd in Ease of Doing Business** (World Bank's 2020 report).
- **Infrastructure Development and Logistics Advancements:** India is aggressively upgrading its infrastructure to support industrial expansion and supply chain efficiency.
 - The **Gati Shakti National Master Plan** aims to integrate road, rail, air, and port connectivity to enhance logistics.
 - Initiatives like the **PM MITRA Mega Textile Parks** and the **Dedicated Freight Corridors (DFC)** are strengthening industrial clusters.
 - The **Budget 2025-26**, aligned with the **Viksit Bharat @ 2047** vision, allocates ₹11.21 lakh crore to the infrastructure sector.
- **Technological Adoption and Industry 4.0:** India is embracing automation, AI, IoT, and robotics to modernize manufacturing and improve global competitiveness.
 - The **National Quantum Mission** and investment in semiconductor fabrication (e.g., **semiconductor plant in Dholera**) signal a shift towards high-tech manufacturing.
 - The **PLI scheme for IT hardware and electronics** is also bolstering the electronics and semiconductor industry, attracting global players like Foxconn and Micron.
 - India is projected to become a **\$300 billion electronics manufacturing hub by 2026** and the **Semicon India Program** has earmarked ₹76,000 crore (\$9 billion) to develop chip manufacturing.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Growth of Green and Sustainable Manufacturing:** With increasing global demand for sustainable production, India is positioning itself as a green manufacturing hub.
 - The **National Green Hydrogen Mission** and incentives for renewable energy industries are attracting investments.
 - Policies like **Faster Adoption and Manufacturing of Electric Vehicles (FAME II)** and the **solar PLI scheme** promote clean energy adoption in industries
 - India targets **50% of energy from non-fossil fuels by 2030** and aims to produce **5 MMT of green hydrogen annually by 2030**, making it an attractive exporter.
- **Geopolitical Realignment and China+1 Strategy:** The global supply chain restructuring, driven by the U.S.-China tensions and Covid-19 disruptions, has led to increased investments in India.
 - Companies are diversifying their manufacturing bases, and India is benefiting from the **China+1 strategy**.
 - Major firms like **Apple, Tesla, and Samsung** are expanding Indian production facilities to reduce dependence on China.
 - Apple's iPhone exports from India surged nearly four times on year to cross **\$5 billion (more than Rs 40,000 crore)** in FY23
 - India's CEA V. Anantha Nageswaran suggests that India can boost manufacturing by **strategically replacing certain imports with Chinese investments**, aligning with the **China Plus One strategy** to integrate into global supply chains.
- **Rigid Labor Laws and Skill Gaps:** Despite **labor code reforms**, bureaucratic hurdles and compliance burdens persist, discouraging large-scale labor-intensive industries.
 - Additionally, **skill gaps in advanced manufacturing, AI-driven production, and semiconductor fabrication** limit India's ability to compete in high-tech industries.
 - India will need **30 million digitally skilled professionals by 2026**, and **50% of the current workforce** will need to re-skill themselves
 - The shift from India's predominantly unorganized workforce (**90%**) to a globally competitive labor pool remains slow.
- **Weak MSME Ecosystem and Credit Constraints:** **MSMEs**, which form the backbone of Indian manufacturing, face severe credit shortages and limited access to technology.
 - Delays in **availing loans, high-interest rates, and collateral requirements** restrict their growth potential.
 - According to **CRISIL estimates**, **only 20% of India's MSMEs have access to formal credit**.
 - While the increase in CGTMSE guarantees has provided some relief, **only 2.5 crore out of 6.3 crore MSMEs** have availed formal credit, underscoring a significant gap.
- **Infrastructure Gaps and Power Reliability Issues:** Despite improvements, **inconsistent power supply, inadequate industrial land, and poor urban planning** hinder manufacturing expansion.
 - Frequent electricity disruptions in industrial zones increase production costs and deter foreign investors.
 - The overall impact on the GDP due to power shortage is expected to be a fall of about **1-1.9%**.
 - Additionally, **delays in land acquisition and complex regulatory approvals** slow down the setup of new manufacturing units, particularly in high-growth sectors like semiconductors and EVs.
 - The lack of a **plug-and-play industrial ecosystem** remains a critical bottleneck.
- **Dependence on China for Critical Components and Raw Materials:** Despite India's push for self-reliance, **its heavy dependence on China for raw materials, electronics, and critical inputs** weakens its supply chain resilience.

What are the Key Challenges Hindering India's Emergence as a Global Manufacturing Hub?

- **High Logistics and Supply Chain Costs:** India's logistics costs remain significantly higher than global benchmarks, **reducing export competitiveness**.
 - The **Economic Survey 2022-23** pointed out that logistics costs in India have been in the range of **14-18% of GDP** against the global benchmark of **8%**
 - Inefficiencies in **transport networks, port congestion, and last-mile connectivity** delays increase operational costs for manufacturers.
 - Without streamlined logistics, **India struggles to match China and Vietnam** in cost-effectiveness for large-scale manufacturing.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Key industries like **pharmaceuticals** (70% of **Active Pharmaceutical Indicators**), **electronics**, and **renewable energy** (semiconductor wafers) rely on Chinese imports, making India vulnerable to geopolitical disruptions.
 - While initiatives like the PLI scheme aim to localize production, the transition to domestic sourcing remains slow and costly.
 - **India imports 70% of its API (Active Pharmaceutical Ingredients)** from China. After India removed curbs on using imported solar modules in 2023, imports of Chinese solar components rose **400% in less than a year**.
 - **Slow Adoption of High-Tech Manufacturing and R&D Weakness:** India lags in **advanced manufacturing capabilities**, particularly in AI, robotics, and semiconductor fabrication.
 - While the **Semicon India Program** aims to establish chip manufacturing plants, execution delays and lack of a robust R&D ecosystem pose challenges.
 - India spends only **0.65% of GDP on R&D**, compared to **2.4% in China and 4.8% in South Korea**.
 - **Global Trade Uncertainties and Geopolitical Risks:** India's trade competitiveness faces challenges due to **global economic uncertainties, protectionist policies, and geopolitical tensions**.
 - India is **yet to finalize crucial trade agreements with the EU, UK, and Canada**, which limits its export potential.
 - Additionally, the **US-China trade war** and disruptions in global supply chains (like the **Red Sea Crisis**) affect India's raw material sourcing and export markets.
 - Without stronger trade alliances, India risks missing opportunities in global value chains.
 - India's exports declined by 2.38% to \$36.43 billion in January 2025 due to low demand while imports surged by 10.28% to \$59.42 billion.
- What Measures can India Adopt to Advance Towards Make in India, Make for the World?**
- **Enhancing Logistics and Supply Chain Efficiency:** India must lower logistics costs by fast-tracking the **Gati Shakti National Master Plan**, optimizing **multi-modal transport networks**, and integrating **Dedicated Freight Corridors (DFC)** with industrial clusters.
 - Strengthening port modernization, warehousing infrastructure, and inland waterways will
 - reduce transit delays and improve global trade competitiveness.
 - **Streamlining customs clearance, single-window approvals, and leveraging blockchain** for supply chain transparency will enhance efficiency.
 - A focus on regional trade hubs and free trade zones can further position India as a global manufacturing hub.
 - **Labor Law Reforms and Workforce Skilling:** Full implementation of the four labor codes is crucial for easing compliance and promoting labor-intensive industries.
 - Introducing **flexible hiring policies, gig economy integration, and sector-specific wage policies** will enhance employment generation.
 - Expanding Skill India, PMKVY, and apprenticeship programs **aligned with Industry 4.0, AI, robotics, and semiconductors** will create a future-ready workforce.
 - Strengthening **industry-academia linkages, vocational education, and STEM learning** will drive innovation.
 - Encouraging women's workforce participation through **workplace safety measures** and incentives can boost productivity.
 - **Strengthening MSME Ecosystem and Credit Access:** Streamlining credit disbursement through digital platforms, **increasing ECLGS (Emergency Credit Line Guarantee Scheme) coverage**, and lowering collateral requirements will enhance MSME growth.
 - Expanding **Mudra loans, SIDBI assistance, and factoring mechanisms** will improve liquidity for small manufacturers.
 - Encouraging MSME participation in global supply chains through **cluster-based development, technology adoption, and export incentives** will enhance competitiveness.
 - Supporting local component manufacturing under the **Atma Nirbhar Bharat initiative and One District One Product Initiative** will reduce import dependency.
 - **Infrastructure Modernization and Industrial Corridors:** Accelerating industrial corridor projects such as **DMIC (Delhi-Mumbai Industrial Corridor)**, **CBIC (Chennai-Bengaluru Industrial Corridor)**, and **AKIC (Amritsar-Kolkata Industrial Corridor)** will boost manufacturing hubs.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Expanding plug-and-play industrial zones with ready infrastructure, uninterrupted power supply, and low-cost land acquisition policies will attract investments.
- Strengthening **smart cities, urban logistics hubs, and green energy grids** will ensure sustainable industrialization.
- Leveraging public-private partnerships (PPPs) in infrastructure financing will ease fiscal constraints.
 - **Integrating high-speed rail freight systems with major industrial zones** will improve supply chain resilience.
- **Reducing Import Dependence and Strengthening Domestic Manufacturing:** India must accelerate indigenization in critical sectors such as **semiconductors, electronics, pharmaceuticals, and defense manufacturing**.
 - **Expanding PLI (Production Linked Incentive) schemes and integrating R&D incentives** for high-value manufacturing will reduce foreign reliance.
 - Developing **special economic zones (SEZs) for electronic components and auto parts** can enhance import substitution.
 - Encouraging joint ventures, technology transfers, and domestic value chain integration will enhance self-reliance.
- **Boosting High-Tech Manufacturing and R&D Ecosystem:** India must scale up high-value manufacturing in **semiconductors, aerospace, electric vehicles (EVs), biotech, and deep-tech sectors** through targeted R&D funding.
 - Expanding **National Quantum Mission, AI innovation hubs, and startup incubation programs** will create a globally competitive tech-driven manufacturing ecosystem.
 - Strengthening **patent protection, technology transfer policies, and university research grants** will drive innovation.
 - Promoting **public-private partnerships (PPPs) in R&D** will enable faster commercialization of indigenous technologies.
- **Strengthening Global Trade Partnerships and Export Competitiveness:** India must aggressively **finalize pending FTAs with the EU, UK, and Canada** to expand market access for manufacturers.
 - Strengthening **participation in global value chains (GVCs) by integrating domestic industries with multinational supply networks** will drive exports.

- Enhancing export credit facilities, **cross-border e-commerce integration, and global marketing support** will improve trade competitiveness.
- Strengthening bilateral trade agreements in emerging markets (like **Africa**) will diversify export destinations.
- **Transitioning to Sustainable and Green Manufacturing:** Promoting **carbon-neutral industrial zones**, expanding Green Hydrogen Mission, and incentivizing solar and wind energy adoption will make India a leader in sustainable manufacturing.
 - Encouraging **circular economy practices, eco-friendly packaging, and zero-waste production models** will align industries with global ESG standards.
 - Imposing **green regulations while offering tax incentives for sustainability investments** will drive eco-conscious manufacturing.
 - Establishing **certification frameworks for carbon credits, green bonds, and renewable energy adoption** will attract global investors.

Conclusion:

India's manufacturing growth hinges on **policy reforms, infrastructure upgrades, and technological advancements** to enhance global competitiveness. By strengthening logistics, MSME support, high-tech R&D, and sustainable practices, the nation can solidify its position as a global manufacturing powerhouse. Embracing '**Vocal for Local, Local to Global**' will be key to making India a hub for world-class manufacturing.



President's Rule and Federalism in India

*This editorial is based on "**President's Rule and the road ahead**" which was published in The Hindu on 20/02/2025. The article discusses the imposition of President's Rule in Manipur, focusing on rebuilding trust, promoting fairness, and avoiding divisive agendas for lasting peace.*

Tag: GS Paper - 2, Indian Constitution, Constitutional Amendments, Federalism, Centre-State Relations, Emergency Provisions, Judiciary.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



The imposition of **President's Rule in Manipur** has revived discussions on **federalism** and central intervention. **Article 356**, intended as a safeguard against **governance failures**, has frequently faced criticism for its potential misuse. Since **1950**, it has been imposed **134 times**, with **Manipur experiencing it 11 times**. President's Rule under **Article 356**, allows the **Centre to assume State administration** when governance fails. However, concerns over **federalism, constitutional integrity and potential political misuse** make its application a contentious issue in Indian democracy.

What are the Constitutional Provisions and Significance of President's Rule?

➤ Constitutional Provisions:

- **Constitutional Basis and Emergency Provisions:** The **Indian Constitution**, under Part XVIII (Articles 352 to 360), provides for three types of **emergencies**: **National Emergency (Article 352)**, **President's Rule (Article 356)**, and **Financial Emergency (Article 360)**.
- **Union's Responsibility:** Article 355 mandates that the Union Government must protect every State against **external aggression and internal disturbances** and ensure governance per constitutional provisions.
- **Grounds for Imposition:** President's Rule can be proclaimed under **two constitutional provisions**, namely:
 - **Article 356** empowers the President to assume State administration, granting **Union control** over **executive powers** and allowing Parliament to exercise **legislative authority**.
 - **Article 365** empowers the President to declare governance failure if a State disregards **Union directives**, potentially leading to the invocation of Article 356.
- **Process of Imposition:** A proclamation of President's Rule must be approved by both **Houses of Parliament** within two months.
- **Duration and Extensions:** President's Rule is initially imposed for **six months** and can be extended up to **three years**.
 - Extensions beyond one year require a **National Emergency** under **Article 352** or an Election Commission certification that elections cannot be held in the State.

➤ Significance:

- **Ensuring Constitutional Governance:** President's Rule under **Article 356** prevents a **leadership vacuum** during a State's administrative breakdown.
- **Restoring Stability and Law & Order:** It allows the Union Government to intervene, **restore stability, and conduct fresh elections**.
- **Constituent Assembly Debate:** Debates on **Article 356 and 365** raised fears of **political misuse and ambiguity** in defining constitutional breakdown.
 - While some members feared **excessive centralization**, others defended these provisions as essential for **maintaining national unity and stability**.
 - **Dr. B.R. Ambedkar** defended these provisions as a **necessary safeguard for constitutional order** but hoped they would remain a **"dead letter"** and be used only in exceptional cases.

President's Rule in India Till Date

- **President's Rule has been imposed 134 times across 29 States and UTs since 1950**, reflecting both its utility as a governance tool and concerns over its misuse.
- **First Instance (1951)** – Punjab was the **first State to come under President's Rule**.
- **Most Frequent Impositions** – **Manipur and Uttar Pradesh** have experienced President's Rule **11 times each**, indicating **chronic political instability**.
- **Longest President's Rule** –
 - **Jammu & Kashmir** holds the record with **over 12 years (4,668 days)** due to separatist movements.
 - **Punjab (1980s)** witnessed **over 10 years (3,878 days)** during militancy.
 - **Puducherry** remained under **President's Rule for over seven years (2,739 days)**.

How Does President's Rule Work?

- **Executive and Legislative Control:** Under President's Rule, **State executive powers** shift to the **Union Government**, and **legislative functions** are exercised by **Parliament**.
 - However, the **judiciary**, including the **High Court**, remains unaffected.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Governor's Role as Central Administrator:** The Governor administers the State on behalf of the President, assisted by the Chief Secretary or centrally appointed advisers.
- **Impact on the State Legislature:** The State Legislative Assembly may be suspended or dissolved by the President.
 - Parliament assumes responsibility for law-making in the State during the period of President's Rule.
 - Ordinances may be promulgated when Parliament is not in session to address urgent matters.
- **Financial and Administrative Control:** The President can sanction expenditures from the Consolidated Fund of the State for governance.
 - Administrative actions and policy decisions align with the Centre's priorities, often sidelining State-specific needs.
- **Revocation of President's Rule:** The President can revoke President's Rule through a **fresh proclamation**, without requiring **parliamentary approval**.

Difference Between National Emergency and President's Rule

Aspect	National Emergency (Article 352)	President's Rule (Article 356)
Grounds for Imposition	Declared when India's security is threatened by war, external aggression, or armed rebellion.	Declared when a state government fails to function as per the Constitution, unrelated to war or external aggression.
Effect on State Government	The state executive and legislature continue to function, while the Centre gains concurrent powers.	The state executive is dismissed, and the legislature is suspended or dissolved, with the President governing through the Governor.
Legislative Powers	Parliament legislates on State List subjects but cannot delegate powers.	Parliament can delegate law-making powers to the President or other authorities.
Duration	No maximum period; can continue indefinitely with Parliament's approval every six months.	The maximum limit of three years, must end with the restoration of constitutional governance.
Effect on Centre-State Relations	Modifies Centre's relationship with all states.	Modifies Centre's relationship with only the affected state.
Parliamentary Approval	Requires a special majority for approval and continuation.	Requires simple majority for approval and continuation.
Impact on Fundamental Rights	Can restrict Fundamental Rights under Articles 19, 20, and 21.	Does not affect Fundamental Rights of citizens.
Revocation Process	Lok Sabha can pass a resolution for revocation.	Revocation is solely at the President's discretion.

What are the Debates Associated with the Imposition of President's Rule?

- **Federalism and Constitutional Autonomy:** President's Rule undermines federalism by allowing **excessive centralization** of power and diminishing State autonomy.
 - The imposition of **President's Rule weakens elected State governments**, allowing the **Centre to assume executive and legislative control**, reducing State autonomy.
- **Political Misuse for Power Consolidation:** Since 1950, **President's Rule has been misused to dismiss opposition-ruled State governments**.
 - For example, the period of 1966–1977 saw 48 impositions of the President's Rule.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Definition of Constitutional Breakdown:** The Constitution does not precisely define “**failure of constitutional machinery**”, leading to **subjective interpretations** and misuse by the Centre.
- **Constitutional Safeguards:** Initially, the President’s satisfaction under Article 356 was beyond judicial review.
- The **38th Amendment (1975)** made President’s Rule non-justiciable, but the **44th Amendment (1978)** restored **judicial review**.
- **Governance Paralysis:** President’s Rule delays policy execution and weakens administration as State officials report directly to the Centre.
- **Misuse by the Governor:** The Governor’s role in recommending President’s Rule has been controversial, as seen in the **Arunachal Pradesh 2016 case**.
 - **Punchhi Commission’s** suggested that Governors should act independently and not be “agents of the Centre.”

What are the Supreme Court’s Key Observations on President’s Rule?

- **State of Rajasthan v. Union of India (1977):** **The Supreme Court** upheld the **Centre’s broad discretion** under **Article 365** to impose **President’s Rule**.
 - The Supreme Court ruled that **judicial review is limited**, reinforcing the **unitary bias in Indian federalism** and allowing the dismissal of State governments for constitutional non-compliance.
- **S.R. Bommai Case (1994):** The **S.R. Bommai vs. Union of India (1994)** judgment set important limits on the use of Article 356.
 - The court ruled that the **President’s Rule is conditional, not absolute**, and is subject to judicial review.
 - The Court emphasized that Article 356 should only be invoked as a **last resort** and not for political purposes.
 - The Court also ruled that the President **cannot dissolve a state’s assembly without Parliament’s approval** and must first issue a warning to the state government.
 - The Supreme Court ruled that a government’s majority must be tested on the **floor of the House** before recommending President’s Rule.

- **Rameshwar Prasad Case (2006):** The Supreme Court held that the **dissolution of the Bihar Legislative Assembly** under **President’s Rule** was unconstitutional.
 - It emphasized **judicial review** of such decisions, reinforcing that **President’s Rule** should only be used for genuine breakdowns in governance, not political reasons.
- **Gujarat Mazdoor Sabha Case (2020):** The Court clarified that under **Article 356**, President’s Rule can only be invoked when **internal disturbances** disrupt the **constitutional machinery** of a state, making it impossible for the state government to function as per the Constitution.

What Should be the Way Forward?

- **Sarkaria Commission Recommendations:** Article 356 (**President’s Rule**) should be invoked **only in exceptional circumstances**, as a **last resort** when all other options have been exhausted.
 - The Governor cannot dismiss the Council of Ministers as long as it retains **majority** support in the State Assembly.
- **Punchhi Commission Recommendations:** When state administration collapses due to **external aggression or internal disturbances**, the Union must first exhaust all options under **Article 355** before invoking **Article 356** strictly for constitutional failure.
 - To prevent misuse, **Article 356** should align with the **S.R. Bommai (1994)** ruling through constitutional amendments, ensuring clarity and preserving **Centre-State relations**.
 - Given strict conditions for Articles 352 and 356, a **localized emergency framework** would allow targeted Central intervention without dissolving the **State Assembly**, maintaining State governance.
- **NCRWC Recommendations:** The **National Commission to Review the Working of the Constitution (NCRWC)** recommended limiting Article 365’s misuse by ensuring **clear criteria for non-compliance** before invoking **President’s Rule**.
 - It emphasized **judicial safeguards**, requiring the **Governor’s report to be detailed**, and advocated for alternative measures before Central intervention in State affairs.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Strengthening Safeguards: Mandatory floor test** before imposition is required to prove the government's loss of majority before invoking Article 356.
 - No immediate dissolution of State Assemblies should occur until Parliament approves the President's Rule proclamation to prevent misuse.
- **Legal and Constitutional Reforms:** Defining "**failure of constitutional machinery**" in **Article 356** is essential to avoid misuse and subjective interpretation.
 - Reducing the maximum duration of President's Rule should be reconsidered to prevent prolonged Central control.
- **Improving Governance Accountability:** Conducting timely elections to restore **democratic governance** is essential, ensuring elections are held promptly to return governance to an elected government.
 - Encouraging **decentralized administration** during President's Rule by strengthening local governance mechanisms can prevent excessive dependency on the Centre during President's Rule.
- **Ensuring Democratic Integrity and Federal Balance:** President's Rule should serve as a constitutional safeguard for **crisis management** rather than a tool for political maneuvering.
 - Strengthening judicial scrutiny, revising constitutional guidelines, and reinforcing federalism will ensure that **Article 356** is applied judiciously within a democratic framework.

Conclusion

Dr. B.R. Ambedkar hoped **President's Rule** would remain a "**dead letter.**" To uphold democracy, it must be a **constitutional safeguard, not a political tool.** Strengthening **judicial oversight**, defining governance failure, and ensuring timely elections can prevent misuse. A **balanced approach** that respects federalism while ensuring stability is crucial for India's democratic framework.



Future Cities Planning for Resilience and Inclusivity

*This editorial is based on "**Kumbh's transient city raises lessons in urban planning and resilience**" which was published in Business Standard on 21/02/2025. The*

article highlights that the Kumbh Mela exemplifies transient urbanism, demonstrating rapid infrastructure development for a temporary city while raising important questions about sustainability, safety, human behavior, and collective responsibility in urban planning.

Tag: GS Paper-2, Urbanization, Local Self Governance, Government Policies & Interventions.

The **Kumbh Mela's transient city** showcases rapid urbanization but also highlights challenges in **sustainability, resilience, and governance.** With India's urban population projected to reach **50% by 2050**, unplanned growth is straining **housing, transportation, and resources.** Inadequate planning, poor governance, and a shortage of urban planners worsen congestion and environmental issues. Strengthening urban planning, governance, and sustainable **infrastructure** is crucial for **future-ready cities.**

What is the Need for Reforming Urban Planning and Transformation?

- **Rapid Urbanization:** India's **urban population** is projected to reach **50% by 2050**, increasing pressure on infrastructure.
 - Between 2001 and 2011, Census towns increased from 1,362 to 3,892, highlighting **unplanned growth.**
 - Inadequate urban planning leads to **congestion, housing shortages, environmental degradation, and resource mismanagement.**
 - The McKinsey Global Institute estimates that India needs to invest **\$1.2 trillion** in urban infrastructure by 2030.
- **Lack of Comprehensive Planning Mechanisms:** According to **NITI Aayog**, **52%** of the 4,041 statutory towns (as per the **2011 Census of India**) currently lack an approved or under-preparation **master plan.**
 - Unplanned **urban sprawl** results in inefficient **transportation systems, water scarcity, and sanitation issues.**
 - Retrofitting cities becomes costly and ineffective once **unregulated expansion** takes place.
- **Shortage of Skilled Urban Planners:** As per a study by TCPO and NIUA for NITI Aayog, while India has only 17,000 urban planners, there is a shortage of 12,000 town planners.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Without **skilled professionals**, urban governance remains **fragmented, inefficient, and unsustainable**.
- **Fragmented Urban Governance:** The **74th Constitutional Amendment** aimed to empower **Urban Local Bodies (ULBs)** but remains inadequately implemented.
 - Multiple agencies handling urban planning independently lead to inefficiencies and poor service delivery.
 - ULBs lack **financial autonomy**, making them dependent on state and central governments for funds.
 - For instance, the cities of **Bengaluru and Jaipur** are collecting a meager **5 to 20 %** of the potential income from property taxes.

What are the Challenges in Urban Planning and Transformation?

- **Outdated Regulatory Frameworks:** Most state-level **Town and Country Planning Acts** are outdated, failing to address modern urban challenges.
 - Regulations lack provisions for **climate resilience, smart infrastructure, and sustainable urbanization**.
 - Slow land acquisition processes hinder the timely implementation of **infrastructure projects**.
- **Inefficient Land Utilization and Slum Growth:** Poor land-use policies contribute to congestion, unplanned expansion, and increasing slum populations.
 - **Encroachments and unauthorized colonies** continue to grow due to weak enforcement of zoning laws.
 - As per 2011 census, **Maharashtra and Andhra Pradesh**, with a combined slum population of 2.20 crore, accounted for approximately **33.6%** of India's total slum population of **6.55 crore**.
 - The **Dharavi Redevelopment Project** aims to rehabilitate **more than 1 million** slum dwellers but faces delays due to land disputes.
- **Limited Public Participation and Awareness:** Despite higher literacy rates, public engagement in urban planning remains minimal.
 - **Lack of awareness** about urban governance leads to ineffective policy implementation.

- **Participatory budgeting**, where residents contribute to **decision-making**, is largely absent in Indian cities.
- **Financial Constraints in Urban Local Bodies (ULBs):** ULBs struggle with revenue generation due to **low property tax** compliance and poor financial management.
 - As per **RBI report**, the tax revenues constitute only **30% of Municipal Corporations' income**.
 - The dependence on central and state funding limits cities' ability to execute independent development plans.
- **Environmental Challenges and Climate Resilience:** India generates **42 million tons of municipal solid waste** annually, with **72%** from Tier-I cities.
 - Unregulated urbanization exacerbates **pollution, waste mismanagement, and resource depletion**.
 - Air quality in major cities like Delhi, Mumbai, and Bengaluru continues to deteriorate due to poor urban planning.
 - A **Lancet Planet Health study** found that no part of India meets WHO's air quality standards, with PM2.5 pollution linked to 1.5 million deaths annually.

What Steps Have been Taken for Urban Planning and Transformation?

- **Legislative and Policy Reforms:**
 - The 1996 Urban Development Plan Formulation and Implementation (UDPI) Guidelines streamlined the planning process.
 - The **2014 Urban and Regional Development Plan Formulation and Implementation (URDPFI)** Guidelines introduced modern urban strategies.
 - The **15th Finance Commission** recommended municipal reforms and increased funding for **urban governance**.
 - **The Model Tenancy Act (2021)** aims to formalize rental markets and prevent housing shortages.
 - The **Government of India** promoted **municipal bonds** to enhance **urban infrastructure financing** under the **Smart Cities Mission and AMRUT**.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Cities like **Pune, Indore, and Ahmedabad** successfully issued bonds, ensuring financial sustainability and improved urban governance through market-driven investments.

➤ Initiatives:

- In **Union Budget 2025-26**, the **Urban Challenge Fund** has allocated ₹1 lakh crore to support **Cities as Growth Hubs, Creative Redevelopment of Cities, and Water and Sanitation**, with ₹10,000 crore specifically earmarked for 2025-26.
- **The Smart Cities Mission (2015)** promotes **technology-driven governance** and infrastructure improvements.
- **AMRUT (Atal Mission for Rejuvenation and Urban Transformation)** focuses on basic urban infrastructure development.
- **Pradhan Mantri Awas Yojana (PMAY)** aims to provide affordable housing to urban poor.
- **Swachh Bharat Mission-Urban** is a nationwide initiative aimed at eliminating open defecation, improving waste management, and promoting cleanliness in urban areas.
- **Deen Dayal Antyodaya Yojana - NULM** is a mission empowering urban poor through **skill development, self-employment, and financial inclusion** for sustainable livelihood opportunities.
- **The Gati Shakti Master Plan (2021)** integrates transport, logistics, and urban infrastructure to streamline development.
- **Integration of Digital and GIS-Based Planning:**
 - **GIS-based master plans** are being implemented under AMRUT for Class-I cities.
 - **Digital platforms** for citizen engagement, like **MyGov**, enhance transparency in urban governance.
 - The adoption of **AI and big data** analytics aids in traffic management and service delivery.
 - For example, the **Pune Expressway** uses **Intelligent Traffic Management System (ITMS)** to monitor traffic violations, detect patterns, and improve **safety and efficiency** for a smoother travel experience.
 - **The Digital India Land Records Modernization Program (DILRMP)** has digitized 95% of land records, improving urban planning.

Best Practices and Examples of Urban Transformation in India

- **Kumbh Mela: A Model for Temporary Urbanization:** The 2025 Kumbh Mela in Prayagraj showcased rapid infrastructure development, **AI surveillance**, and **smart city solutions**.
 - 30 pontoon bridges and 92 renovated roads ensured smooth traffic movement.
 - AI-enabled surveillance with 2,700 CCTV cameras and drones enhanced safety and crowd management.
 - The event generated **\$2.7 billion** in economic activity, highlighting urban planning's economic potential.
- **Indore's Waste Management Model:** Indore's decentralized waste management system achieved 100% waste segregation at source.
 - The city implemented strict monitoring, citizen engagement, and composting units to reduce landfill dependency.
 - **Indore** has consistently ranked as India's cleanest city in the **Swachh Survekshan** rankings since 2017.
- **Urban Traffic Management: Chandigarh's AI Traffic System** automates violation detection with 2,000+ CCTV cameras, ensuring seamless rule enforcement.
 - **Kolkata's Real-Time Traffic Management** adjusts signals using AI to reduce wait times and improve vehicle movement.
- **Bengaluru's Sustainable Mobility Initiatives:** Metro expansion projects and electric bus fleets aim to reduce congestion and emissions.
 - Integration of last-mile connectivity with electric vehicles and bicycle-sharing programs enhances accessibility.
 - The **Namma Metro Phase-2** expansion will cover 72 km, reducing travel time by 40%.
- **Chennai's Water Management Reforms:** By implementing mandatory rainwater harvesting, Chennai has enhanced its water quality and significantly raised groundwater levels.
 - The city now fulfills 15% of its water demand through recycling, and 8% of treated wastewater is sold to industries.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



➤ Other Best Practices:

- Visakhapatnam built India's first park designed for differently-abled children, featuring sensory experiences, wheelchair accessibility, and safe play zones to promote inclusive urban spaces.
- Jabalpur's 311 App enables citizens to access civic services, report grievances, and track public infrastructure issues. The app ensures direct governance interaction and real-time resolution.
- Surat's Integrated Command and Control Centre for Urban Management integrates IT systems for city surveillance, traffic control, and emergency response. The system enhances urban governance, citizen safety, and municipal efficiency.
- Nashik adopted a multi-level flood preparedness plan, integrating GIS mapping, real-time alerts, and coordinated rescue operations, significantly reducing disaster impact on urban infrastructure.
- Chennai transformed Pondy Bazaar into a pedestrian-friendly promenade, enhancing walkability, urban aesthetics, and local business engagement, making cities more livable.

What Should be the Way Forward?

- **Enhancing Urban Governance and Autonomy:** Cities should be granted greater financial autonomy by leveraging property taxes and land value capture.
 - Germany's municipal finance system allocates nearly 15% of total tax revenue to city governments.
 - Also, Mumbai Municipal Corporation boosted revenue through property tax reforms and land monetization, planning to assess 50,000 slum businesses for ₹350 crore, serving as a model for other urban bodies.
- **Expanding PPP for Infrastructure Development:** Bangalore's Kempegowda International Airport, developed through Public-Private Partnerships (PPPs), showcases effective private sector participation in urban infrastructure.
 - The UK's Thames Tideway Tunnel project, a successful PPP initiative, can serve as a model for cleaning rivers like Yamuna and Musi through efficient sewage management.

- **Sustainable Urban Development:** Singapore's Green Plan 2030 focuses on sustainable transport, waste management, and net-zero carbon developments.
 - Copenhagen has developed a climate adaptation plan with blue-green infrastructure to combat urban flooding.
 - Surat's Climate Resilience Strategy, combining flood management, urban greening, and sustainable water practices, can serve as a model for other cities facing similar environmental challenges.
- **Strengthening Digital and Smart Urban Planning:** Barcelona's smart city initiatives use IoT technology to optimize waste management and urban mobility.
 - India's Smart Cities Mission has deployed integrated command centers in cities like Bhopal and Pune for real-time monitoring.
- **Promoting Inclusive and Participatory Urban Development:** The participatory budgeting model in Porto Alegre, Brazil, empowers residents in municipal decision-making.
 - Pune's participatory budgeting model, empowering local communities to propose and implement urban projects, can serve as a valuable example for other cities fostering community-driven development.

Conclusion

India's urban transformation must focus on sustainable growth, efficient governance, and inclusive planning. Strengthening urban governance, digital integration, and skilled workforce will create resilient, people-centric cities. A forward-looking approach will ensure livable, environmentally sustainable, and economically vibrant urban spaces, fostering long-term prosperity for future generations.



India's Soil Health Crisis

This editorial is based on "Fixing India's soil crisis: Farmer awareness, tech can arrest degradation" which was published in Business Standard on 23/02/2025. The article brings into picture the adverse impact of India's skewed fertilizer policy, where excessive urea subsidies have led to a severe nutrient imbalance.

Tag: GS Paper - 3, Conservation, Environmental Impact Assessment (EIA)

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



India's soil health crisis stems from a skewed **fertilizer policy** that heavily subsidizes urea, leading to excessive nitrogen application. The current NPK ratio of **7.7:3.1:1** stands in stark contrast to the ideal **4:2:1** ratio, reflecting a severe nutrient imbalance in agricultural soils. This over-reliance on nitrogen-based fertilizers, coupled with insufficient use of phosphorus, potassium, micronutrients, and organic manure, has triggered a **vicious cycle of declining soil productivity**.

As India aims to ensure food security for its growing population, addressing this soil health crisis through balanced nutrient management and policy reforms demands urgent attention.

What is the Role of Soil in Maintaining India's Agricultural Prosperity?

- **Foundation of Food Security and Crop Productivity:** Soil is the primary medium for **plant growth**, directly influencing crop yields, nutrient absorption, and overall agricultural output.
 - The fertility of Indian soils sustains high productivity for staple crops like **rice, wheat, and pulses**, ensuring food security for 1.4 billion people.
 - Different soil types, such as **alluvial in the Indo-Gangetic plains and black soil in Maharashtra**, support diverse cropping patterns.
 - The **FAO Report** highlights that **95% of global food production relies on soil**, making its preservation crucial for India's agricultural sustainability.
 - In **2022-23**, foodgrain production hit an all-time high of **329.7 million tonnes**, and oilseeds production reached 41.4 million tonnes.
- **Ensuring Nutrient Cycling and Soil Microbial Health:** Healthy soil functions as a **natural nutrient reservoir**, providing essential elements like **nitrogen, phosphorus, and potassium** for plant growth.
 - **Microbial activity in soil** plays a vital role in decomposing organic matter, fixing atmospheric nitrogen, and maintaining soil fertility. India's organic farming movement, including traditional techniques like **vermiculture and biofertilizers**, relies on **nutrient-rich soils**.
 - Without efficient nutrient cycling, agricultural productivity declines, increasing dependence on chemical fertilizers.

- **Water Retention and Drought Resilience:** Soil acts as a **natural sponge**, regulating **water infiltration, retention, and drainage**, ensuring stable crop growth.
 - High **organic matter content** in soil enhances **water-holding capacity**, reducing irrigation demand and making crops more resilient to erratic monsoons.
 - In drought-prone regions like **Rajasthan and Bundelkhand**, soil moisture conservation practices like **mulching and cover cropping** help maintain agricultural productivity.
 - Proper soil structure also prevents waterlogging and root diseases in high-rainfall areas.
- **Climate Change Mitigation and Carbon Sequestration:** Soil plays a crucial role in **absorbing and storing carbon**, helping mitigate climate change impacts on agriculture.
 - **Carbon-rich soils** act as a buffer against **extreme weather** by stabilizing temperatures and preventing desertification.
 - Practices like **agroforestry and conservation agriculture** enhance soil carbon sequestration, reducing greenhouse gas emissions.
 - The health of India's agricultural soils directly influences the country's ability to combat climate change and maintain long-term productivity.
 - Agricultural soils have the **technical potential to absorb 3–8 gigatons of CO₂ annually for 20–30 years**, helping bridge the gap between emission reductions and climate stabilization.
- **Biodiversity Conservation and Pest Control:** Healthy soils support a diverse ecosystem of **beneficial microorganisms, fungi, and insects** that contribute to **natural pest control**.
 - Soil-dwelling organisms, such as **earthworms and mycorrhizal fungi**, improve soil aeration and nutrient uptake for crops.
 - A balanced soil ecosystem reduces the **need for chemical pesticides**, making agriculture more sustainable and cost-effective.
 - Also, a recent study found that farms with high soil biodiversity had **fewer pest outbreaks** than degraded soils.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Economic Stability and Rural Livelihoods:** Soil fertility directly influences agricultural income, as **healthy soils lead to higher crop yields and better market prices.**
 - About two-thirds of the Indian population is dependent on agriculture and soil health determines their economic stability and employment prospects.
 - **Fertile soil reduces input costs** by lowering dependency on fertilizers and pesticides, increasing farmers' profit margins.
 - Soil-based agro-industries, such as **organic farming and compost production**, also provide livelihood opportunities in rural India.

What are the Key Factors Contributing to India's Soil Health Crisis?

- **Unsustainable Agricultural Practices:** Excessive use of **chemical fertilizers, pesticides, and monocropping** has degraded soil fertility and caused nutrient imbalances.
 - Intensive farming in states like **Punjab and Haryana**, driven by **MSP-backed wheat-rice cycles**, has led to severe soil degradation.
 - Additionally, **over-tillage and deep plowing** break down soil structure, reducing its ability to retain water and nutrients.
 - The **2022 State of India's Environment Report** found that **30% of India's land** faces degradation.
- **Declining Organic Carbon and Soil Microbial Life:** **Soil organic carbon (SOC)** is crucial for fertility, but **rapid depletion due to reduced organic matter incorporation** has worsened soil health.
 - Burning of crop residues, particularly in the **Indo-Gangetic belt**, eliminates organic matter instead of returning nutrients to the soil.
 - Over-reliance on **synthetic fertilizers disrupts microbial ecosystems**, leading to lower nutrient cycling.
 - Deforestation and encroachment for urbanization further strip soil of natural organic content.
 - The Soil Organic Carbon (SOC) content in India has come down to **0.3% from 1% in the past 70 years**
 - In states like Punjab, **only 6.9% of soils had high organic carbon**, and this percentage declined further in 2024-25.
- **Soil Erosion and Desertification:** Rampant **deforestation, overgrazing, and poor water management** contribute to severe soil erosion and land degradation, especially in semi-arid regions.
 - **Unsustainable mining and industrial activities also strip topsoil**, reducing land's agricultural potential.
 - According to the **Desertification and Land Degradation Atlas of India (SAC 2021)**, the current extent of land degradation in India is **97.85 million hectares**, which represents approximately **29.77% of the country's total geographical area.**
- **Over Extraction and Salinization Due to Poor Irrigation Practices:** Unscientific irrigation, including **excessive groundwater extraction** and **flood irrigation**, leads to soil salinity, alkalinity, and waterlogging.
 - In states like **Punjab and Haryana**, continuous irrigation without proper drainage has caused **secondary salinization.**
 - Canal irrigation without proper management also leads to **waterlogging**, reducing soil aeration and microbial activity.
 - The total annual groundwater extraction for the entire country in 2022 **has been estimated as 239.16 bcm**, with agriculture being the predominant consumer of groundwater resources, accounting for about **87% of the total annual groundwater extraction.**
 - India's 6.7 Mha of salt-affected land results in a loss of 11.18 million tonnes of crops, valued at around **₹150.17 billion.**
- **Climate Change and Extreme Weather Events:** Unpredictable weather patterns, including **erratic monsoons and rising temperatures**, have worsened soil degradation through **droughts, floods, and heat stress.**
 - Intense rainfall events lead to runoff, washing away topsoil and depleting nutrients.
 - Rising temperatures accelerate soil carbon loss, reducing long-term sustainability of agriculture.
 - Due to climate change, high to very high soil erosion zones are projected to rise from 35.3% to **40.3% by the century's end.**
 - For instance, the **2023 Himachal Pradesh floods** led to significant topsoil loss in agricultural areas.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course

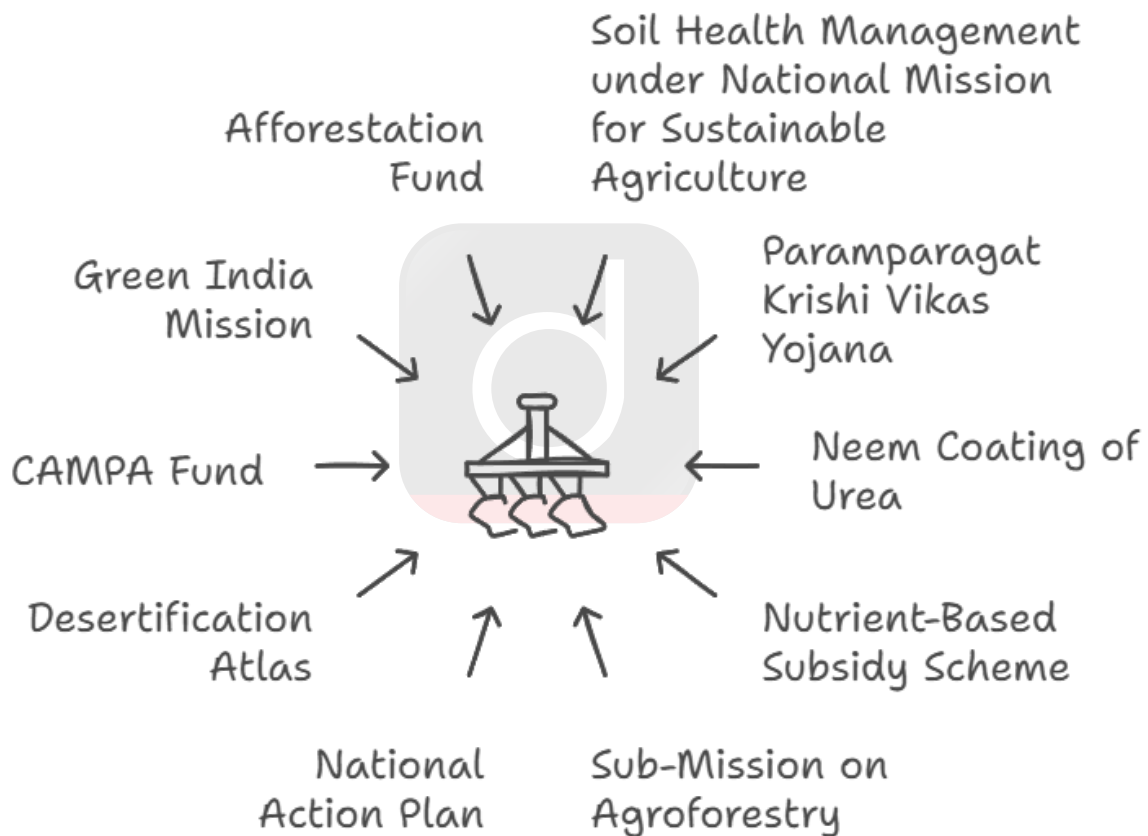


Drishti
Learning
App



- **Pollution from Industrial and Urban Waste:** Unchecked dumping of **heavy metals, industrial effluents, and plastic waste** has led to toxic contamination of agricultural soils.
 - In peri-urban areas, **untreated sewage sludge and landfill leachates** degrade soil structure and introduce hazardous chemicals.
 - Groundwater pollution from landfills and chemical waste further affects soil chemistry.
 - **India's farmland** is heavily contaminated by heavy metals like **lead, cadmium, and arsenic**.

Government Initiatives for Soil Conservation



- **Lack of Effective Policy Implementation and Awareness:** Despite schemes like the **Soil Health Card (SHC) program**, adoption of sustainable practices remains low due to inadequate farmer awareness and follow-up.
 - For the **2024 fiscal year**, India allocated **one-ninth of its total agricultural budget to fertilizer subsidies**.
 - But **many farmers still lack access to real-time soil quality data**, limiting their ability to optimize fertilizer use.
 - Government subsidies on **urea encourage overuse**, despite recommendations for balanced fertilizer application.
 - The existing **NPK ratio of 7.7:3.1:1** deviates significantly from the ideal 4:2:1, highlighting a severe nutrient imbalance in soils.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Loss of Traditional Agroecological Practices:** Traditional organic farming methods, including **green manure**, **crop rotation**, and **agroforestry**, have declined due to the push for high-yield, chemical-dependent crops.
 - Indigenous soil management techniques, such as **“Zai pits” in Rajasthan** and **“Vermiculture” in the Northeast**, are being replaced by intensive, mechanized agriculture.
 - The marginalization of indigenous knowledge, particularly among small and tribal farmers, reduces resilience to soil degradation.
- **Impact of Genetically Modified (GM) Crops and High-Yield Varieties:** The introduction of **GM crops** and **high-yielding varieties (HYVs)** has intensified nutrient depletion, as these crops demand higher fertilizer inputs.
 - **Bt cotton**, for instance, has been linked to declining soil biodiversity in Maharashtra and Telangana.
 - The rapid expansion of HYVs has also led to loss of **traditional, resilient crop varieties that maintain better soil structure**.

What Measures India Can Adopt for Soil Health Restoration and Conservation?

- **Promoting Integrated Nutrient Management (INM) for Balanced Fertilization:** India must shift from excessive chemical fertilizer use to **Integrated Nutrient Management**, combining organic manure, biofertilizers, and judicious synthetic inputs.
 - Promoting **Nano Urea** and organic alternatives can help to reduce fertilizer overuse.
 - **Soil Health Cards (SHC)** and **Paramparagat Krishi Vikas Yojana (PKVY)** should be linked to encourage bio-fertilizer adoption.
 - Large-scale **composting units** in rural areas can enhance organic carbon levels in degraded soils.
- **Expanding Agroforestry and Perennial Crop Systems:** Integrating **trees with agriculture** through **National Agroforestry Policy (NAP)** enhances soil organic carbon, prevents erosion, and boosts farm income.
 - Crops like **alley-cropped millet and legume plantations** can rejuvenate degraded lands while maintaining productivity.

- Agroforestry, already **popular in Karnataka and Odisha**, should be scaled up nationwide.
- Linking **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)** for soil conservation works can support large-scale afforestation on degraded farmlands.
- **Encouraging Zero-Tillage and Conservation Agriculture:** Shifting to **zero-tillage farming** reduces soil erosion, enhances microbial activity, and conserves moisture, especially in wheat-rice cropping systems.
 - **Happy Seeder technology** in Punjab and Haryana has successfully reduced stubble burning while improving soil health.
 - **Direct Seeded Rice (DSR) method** in paddy farming lowers groundwater usage and preserves soil structure.
 - Conservation agriculture, backed by the **National Mission for Sustainable Agriculture (NMSA)**, must be expanded to semi-arid regions.
 - **Brazil’s success in no-till soybean farming** can be adapted to India’s pulse and cereal cultivation.
- **Restoring Degraded Lands Through Agroecological Approaches:** Soil restoration efforts must adopt **agroecology-based models**, incorporating natural ecosystems to improve soil structure and fertility.
 - Encouraging **intercropping and crop rotation** with nitrogen-fixing plants like pulses and legumes can naturally replenish nutrients.
 - Reviving techniques like Rajasthan’s **Zai pit technique** can successfully reverse soil erosion.
 - These approaches should be mainstreamed through **Watershed Development Component (WDC-PMKSY)** under **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)**.
- **Implementing Controlled Irrigation and Preventing Salinization:** Over-irrigation has led to **soil salinity and waterlogging** in the Indo-Gangetic plains; adopting **drip and sprinkler irrigation** can mitigate these effects.
 - Micro-irrigation techniques under **Pradhan Mantri Krishi Sinchayee Yojana** can be promoted to a wider extent to conserve soil moisture while reducing erosion.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Conjunctive use of **rainwater harvesting** and **surface water irrigation** will prevent groundwater depletion.
 - Using **salt-tolerant crop varieties** in saline-affected areas (as done in **coastal Gujarat**) can restore productivity.
- **Strengthening Soil Biodiversity and Microbial Rejuvenation:** Enhancing **soil microbial diversity** through **bioinoculants, vermiculture, and mycorrhizal fungi** can improve soil fertility and plant resilience.
 - **Integrated Farming Systems (IFS)** that combine livestock, cropping, and fish farming ensure natural nutrient cycling.
 - **Decomposers** like **Pusa Bio-Decomposer (IARI innovation)** must be widely adopted for organic residue recycling.
 - Soil-friendly techniques, such as **Fukuoka's natural farming**, have shown promising results.
- **Combating Soil Erosion Through Terracing and Grassland Regeneration:** Hilly and semi-arid regions require **terracing, check dams, and vegetative barriers** to prevent topsoil loss.
 - Encouraging **community-led watershed management** (as done in **Ralegan Siddhi, Maharashtra**) can restore eroded landscapes.
 - Grassland restoration efforts in **Gujarat's Banni Grasslands** provide a model for reviving degraded pasturelands.
 - Linking **Compensatory Afforestation (CAMPA funds)** with soil conservation projects can ensure sustainable land use.
- **Strengthening Policy Implementation and Farmer Awareness:** **Capacity-building initiatives** through Krishi Vigyan Kendras (KVKs) and **FPOs (Farmer Producer Organizations)** must be strengthened.
 - Linking **Soil Health Card Scheme** with **Direct Benefit Transfer (DBT)** can ensure customized fertilizer application for individual farms.
 - A strong policy push under the National Project on Soil Health and Fertility **sub-scheme of National Mission for Sustainable Agriculture (NMSA)** can coordinate state and central efforts effectively.
- **Preventing Industrial and Urban Soil Pollution:** Industrial effluents and **untreated urban waste** have led to toxic contamination of agricultural soils, especially near cities.
 - Implementing **strict soil quality monitoring** under the **CPCB guidelines** can prevent heavy metal accumulation.
 - Promoting **phytoremediation (using plants to absorb toxins)** can rehabilitate contaminated soils in peri-urban areas.
 - Initiatives like **Tamil Nadu's innovative biochar projects** and **Kolkata's East Kolkata Wetlands-based agriculture** show how urban waste can be transformed into soil-enriching resources.
 - Linking **Smart Cities Mission** with urban soil restoration projects can ensure sustainable urban farming.
- **Encouraging Farmers to Adopt Regenerative and Natural Farming:** Regenerative farming techniques, such as **Zero Budget Natural Farming (ZBNF)** and **permaculture**, can enhance soil health while reducing external inputs.
 - **Andhra Pradesh** has demonstrated the feasibility of scaling regenerative practices.
 - Encouraging **cover cropping and mulching** can improve soil structure and prevent nutrient depletion.
 - Policy incentives under **National Mission for Organic Farming (NMOF)** should be expanded for wider adoption.

Conclusion:

India's soil health crisis threatens long-term agricultural sustainability, food security, and rural livelihoods and requires a collaborative approach that drives the **Food-Energy-Water Nexus**. It requires a shift from **chemical-intensive farming to balanced nutrient management, organic amendments, and climate-resilient practices**. Policy reforms, including rationalizing fertilizer subsidies and promoting agroecological approaches, are essential for restoring soil fertility. Strengthening farmer awareness and technological interventions like Soil Health Cards can drive sustainable soil management.



Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



Restoring the Spirit of RTI

This editorial is based on “[The RTI is now the ‘right to deny information’](#)” which was published in The Hindu on 25/02/2024. The article brings into focus the declining effectiveness of the RTI Act, once a landmark reform for transparency, now weakened by bureaucratic dominance, case backlogs, and systemic resistance.

Tag: GS Paper - 2, Right to Information, Quasi Judicial Bodies

The **Right to Information (RTI) Act**, once hailed as a landmark reform that empowered citizens by ensuring transparency and accountability in governance, has faced a **steady decline in effectiveness due to systemic resistance** from those in power. Despite being one of the **world’s strongest transparency laws**, its implementation has been undermined by **Information Commissions** dominated by retired bureaucrats, delays in appointments, and an increasing backlog of cases. The latest setback comes with the **Digital Personal Data Protection Act**, which critics argue is transforming RTI into a “**Right to Deny Information.**”

How did the Right to Information Come into Existence in India?

- Judicial Recognition of Right to Information (1975-1989)
 - **1975:** Supreme Court recognized **Right to Know** as part of fundamental rights.
 - **1982:** Expanded interpretation under **Article 19(1)(a) & Article 21**, linking RTI to **freedom of speech & right to life**.
 - **1985:** NGOs demanded **access to environmental information** post **Bhopal Gas Tragedy**.
- Grassroots Movements and Early Drafts (1990-1999)
 - **1990s:** Movements like **Mazdoor Kisan Shakti Sangathan (MKSS)** in Rajasthan exposed corruption in **wage payments** through **Jan Sunwai (public hearings)**.
 - **1996:** Formation of **National Campaign for People’s Right to Information (NCPRI)**, which drafted an RTI Bill with the **Press Council of India**.
 - **1997:** Government referred the draft to **H.D. Shourie Committee**, which submitted its recommendations.
- Legislative Attempts and Early State RTI Laws (2000-2004)

- **2000:** Parliamentary **Standing Committee** reviewed the RTI draft; Rajasthan, Maharashtra, Goa, Tamil Nadu, Delhi, and Karnataka passed **State RTI laws**.
- **2002:** Parliament passed the **Freedom of Information Act**, but it was **never notified**.
- **2003:** The Supreme Court pressured the government to implement **RTI-based governance reforms**.
- **2004:** UPA government’s **Common Minimum Programme** promised a stronger RTI law.
- Passage of the RTI Act (2004-2005)
 - **2004:** NCPRI submitted amendments to the **National Advisory Council (NAC)**.
 - **December 2004:** Government introduced a **limited RTI Bill** covering only the **Central Government**, leading to protests.
 - **2005:** After lobbying, Parliament passed a **comprehensive RTI Act** covering **Central & State Governments**.
 - **October 12, 2005:** RTI Act came into force, making **Shahid Raza Burney’s** RTI application in **Pune** the first filed under the law.

How does the Right to Information (RTI) Contribute to Governance in India?

- **Strengthening Democracy and Citizen Empowerment:** RTI enables citizens to access **government records, policies, and decisions**, ensuring **accountability**.
 - It strengthens **participatory democracy**, allowing people to question authorities and demand better governance.
 - It also acts as a tool for **social audit**, helping marginalized communities assert their rights.
 - **Example:** RTI applications played a key role in questioning irregularities in the **electoral bond scheme**.
 - Also, the Supreme Court held that the **Electoral Bond Scheme** was unconstitutional for **violating the right to information of voters**.
- **Fighting Corruption and Promoting Good Governance:** RTI helps in uncovering **corruption, bureaucratic inefficiency, and policy failures**, making public officials more accountable.
 - By reducing secrecy in governance, it ensures that **government contracts, fund allocations, and decision-making processes** are subject to scrutiny.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Example:** The **Adarsh Housing Scam (2010)** was exposed when an RTI query revealed how flats meant for war veterans and their families were illegally allotted to politicians and bureaucrats.
- **Ensuring Transparency in Public Welfare Schemes:** RTI helps track the **implementation and fund utilization** of government schemes, preventing leakages and inefficiency.
 - Citizens can demand **attendance records, expenditure details, and beneficiary lists**, ensuring public funds reach the intended recipients.
 - **Example:** Recent RTI queries exposed irregularities in West Bengal's **MGNREGA scheme**, revealing fake work records, outdated job cards, and a flawed tendering process.
- **Upholding Fundamental Rights and Social Justice:** RTI is linked to **Article 21 (Right to Life) and Article 19(1) (a) (Freedom of Speech and Expression)**, as access to information is necessary for informed decision-making and exercising other fundamental rights.
 - It is a crucial tool for **human rights activists, journalists, and marginalized groups** to fight discrimination and injustice.
 - **Example:** In **Bilaspur, Chhattisgarh (2008-09)**, RTI findings exposed the misuse of BPL ration cards, depriving genuine beneficiaries of their entitled grains, forcing the government to rectify the issue.
- **Empowering Media and Whistleblowers:** RTI serves as a powerful investigative tool for **journalists, activists, and whistleblowers**, enabling them to access official records and expose wrongdoing.
 - It has strengthened investigative journalism by making **government contracts, judicial proceedings, and administrative decisions** more accessible.
 - **Example:** The **coal allocation scam ("Coalgate")** was unearthed through RTI, leading to cancellation of **illegal coal block allocations**.

What are the Key Issues Hindering the Effectiveness of RTI?

- **Vacancy and Backlog in Information Commissions:** The efficiency of RTI is crippled by the high number of vacancies in **Central and State Information Commissions**, leading to delays in appeals and complaints.
 - Without adequate commissioners, **cases remain unresolved for years**, reducing RTI's effectiveness.
 - As of **June 2024**, over **4 lakh appeals and complaints** were pending across **29 information commissions**.
 - As of October 2024, **4 State Information Commissions remain defunct due to the absence of commissioners**, while the Central Information Commission operates with **only 3 out of 11 sanctioned members**, according to a **Satark Nagrik Sangathan report**.
- **Dilution through Legislative Amendments:** Recent amendments have undermined the independence of the Information Commissions, making them susceptible to government influence.
 - The **RTI (Amendment) Act, 2019**, gave the central government power to determine the tenure and salaries of Information Commissioners, reducing their autonomy.
 - Further, the **DPDP Act, 2023**, amended **Section 8(1)** of RTI, exempting **all personal information** from disclosure, even if it concerns public officials.
- **Bureaucratic Resistance and Non-Compliance:** Many public officials deliberately delay or deny information, fearing **exposure of inefficiencies and corruption**.
 - Some institutions even refuse to appoint **Public Information Officers (PIOs)**, making it difficult for citizens to access information.
 - Political parties have also defied RTI, limiting scrutiny of their funding and internal workings.
 - In **2023-24**, nearly **42% of RTI appeals** to the Central Information Commission (CIC) were returned without hearing.
- **Expansion of Exemptions and Secrecy Laws:** Several government bodies remain outside the purview of RTI due to broad exemptions.
 - It has been observed that government departments often deny information under RTI, **citing national security concerns under Official Secrets Act, 1923**.
 - **27 security agencies**, including **RAW, IB, and CERT-In**, are exempt under **Second Schedule of RTI Act**.
- **Inordinate Delays in Information Disclosure:** The RTI Act mandates a response within **30 days** (or **48 hours** in life and liberty cases), but authorities often violate these deadlines.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- This delays justice, especially in cases involving human rights violations, environmental clearances, and corruption inquiries.
 - The lack of stringent penalties for such delays encourages lethargy among officials.
- A 2022 report stated that **12 of 29 information commissions in India** have a waiting time of over a year to hear an appeal on wrongful denial of information or complaint.
- **Threats to RTI Activists and Whistleblowers:** RTI activists face serious threats, including harassment and violence, discouraging citizens from exposing corruption.
 - Many activists have been attacked or killed for seeking sensitive information, yet protection mechanisms remain weak.
 - The **Whistleblower Protection Act, 2014**, meant to safeguard informants, has not been effectively implemented.
 - According to the **Commonwealth Human Rights Initiative (CHRI)**, across India, 99 RTI activists have lost their lives and 180 assaulted since 2006.
- **Skewed Gender Representation in RTI Institutions:** The lack of gender diversity in Information Commissions limits the perspective on issues affecting women.
 - Since its inception, the RTI framework has been dominated by male officials, failing to ensure gender-sensitive governance.
 - This weakens the representation of women's concerns in transparency mechanisms.
 - Since the passage of the Right to Information Act in 2005, merely **9% of all information commissioners** across the country have been **women**.
 - Also, **12 out of 29 information commissions** have not had a single woman commissioner since the inception.
- **Lack of Awareness Among Citizens:** Many citizens, especially in rural areas, remain unaware of their RTI rights, **leading to its underutilization**.
 - Government efforts to promote RTI awareness through campaigns and education remain inadequate.
 - Without knowledge of the process, marginalized communities struggle to demand accountability.

- According to a PWC study, only **12%** of the rural population and **30%** in urban population were aware of the RTI Act.

- **Misuse of the Right to Information (RTI) Act:** The RTI Act is a vital tool for transparency, but its misuse for frivolous or non-serious queries burdens public offices and diverts resources from critical governance matters.
 - Some individuals file RTIs to **harass officials or settle personal disputes**, undermining the Act's original intent.
 - For instance, **an RTI was once filed to count the number of cattle in a region**, highlighting how irrelevant queries can strain administrative efficiency.
 - Such misuse weakens the effectiveness of the RTI Act and hampers its role in ensuring accountability.

What Measures can be Adopted to Enhance the Effectiveness of RTI?

- **Filling Vacancies and Reducing Backlogs:** Ensuring timely appointments of **Information Commissioners at both the Central and State levels** is crucial to clearing pending cases.
 - A fixed timeline for recruitment, along with an **independent selection process**, can reduce political influence in appointments.
 - Fast-track mechanisms and additional benches should be introduced to handle high-pendency cases.
 - Leveraging **AI-driven case management systems** can help prioritize urgent matters and expedite hearings.
 - Regular **performance audits of Information Commissions** should be conducted to ensure efficiency.
- **Partial Restoration of Information Commissions' Autonomy:** Strengthening the **State and Central Information Commissions' financial and administrative autonomy** will prevent government interference.
 - The appointment process should involve **parliamentary oversight** rather than executive discretion.
 - Judicial scrutiny through **periodic Supreme Court and High Court reviews** can reinforce independence.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Strengthening Proactive Disclosures (Section 4 of RTI Act):** Public authorities should be mandated to **proactively disclose information online** to minimize the need for RTI requests.
 - Government websites should be regularly updated with details on **budgets, tenders, contracts, decision-making processes, and fund allocations**.
 - Adoption of **Open Data Portals** can ensure real-time access to non-sensitive information.
 - **Social audits and third-party evaluations** should be institutionalized for major schemes and government programs.
- **Curbing Bureaucratic Resistance and Enhancing Compliance:** Strict penalties should be imposed on officials who delay or deny information without valid reasons.
 - Establishing an **RTI Compliance Rating System** for ministries and departments can incentivize transparency.
 - Public Information Officers (PIOs) should undergo **mandatory annual training** to improve awareness and efficiency.
- **Ensuring Protection of RTI Activists and Whistleblowers:** The **Whistleblower Protection Act, 2014**, should be fully implemented with provisions for **anonymous complaints and emergency protection mechanisms**.
 - Fast-track courts should handle cases of **attacks on RTI activists** with strict legal deterrents.
 - Dedicated **RTI Activist Helpline and Support Cells** should be established at district levels.
 - Government and civil society partnerships can set up **legal aid funds** for activists facing threats.
- **Increasing Gender Representation in Information Commissions:** A **minimum gender quota** should be introduced in the appointment of Information Commissioners to ensure diversity.
 - Government recruitment policies should encourage more women to apply for **PIO and IC positions**.
 - RTI training programs should be tailored to **women-led self-help groups (SHGs) and grassroots organizations**.
 - Women-centric **transparency initiatives**, especially in healthcare, social welfare, and rural development, should be promoted.
- **Expanding Awareness and Digital Accessibility:** RTI literacy should be integrated into **school and college curriculums** to build awareness from an early age.
 - The government must conduct **nationwide RTI awareness campaigns** using digital platforms, community radio, and local governance bodies.
 - Simplification of RTI filing procedures, including **regional language support** and **mobile-based applications**, can increase reach.
 - Encouraging **Gram Panchayats to hold RTI awareness sessions** can boost rural participation.
- **Addressing Overlapping Laws like the Official Secrets Act, 1923:** The **Official Secrets Act (OSA), 1923**, should be reformed to align with RTI principles and reduce unjustified secrecy.
 - Government decision-making, especially on issues **not related to national security**, should be made more transparent.
 - The **Second Schedule of RTI Act**, which exempts 27 security agencies, should be periodically reviewed to ensure **non-sensitive information is disclosed**.
- **Leveraging Technology for RTI Implementation:** AI-driven **chatbots and automated RTI assistants** can help citizens draft better RTI applications.
 - Blockchain-based **record-keeping** can prevent data tampering and ensure that disclosed information remains authentic.
 - RTI portals should integrate with **DigiLocker** to provide easy access to publicly available documents.
 - **Real-time tracking systems** should be introduced, allowing applicants to monitor their RTI request status.

Conclusion:

To restore the Right to Information's effectiveness, India must **prioritize timely appointments, enhance digital transparency, and strengthen whistleblower protections**. Proactive disclosures and AI-driven case management can reduce delays and improve governance. A truly empowered RTI framework will reinforce democracy by ensuring accountability and public trust. The future of transparency depends on **revitalizing RTI as a tool for participatory governance**.



Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



Strengthening India-EU Partnership

This editorial is based on “In Trump’s world, India and Europe need each other” which was published in The Indian Express on 26/02/2025. The article highlights that the US’ shifting policies create uncertainty, making Europe a key strategic and economic partner for India.

Tag: GS Paper - 2, Important International Institutions, Government Policies & Interventions, International Treaties & Agreements, Effect of Policies & Politics of Countries on India’s Interests.

The European Commission President’s recent visit to India, accompanied by the entire College of Commissioners, highlights the growing importance of **India-EU relations**. As the U.S. foreign policy shifts, with disruptions in **transatlantic alliances, trade policies, and security commitments**, both India and Europe recognize the need to strengthen their partnership. For India, **deepening trade, security, and technology ties** with the EU provides **economic stability, strategic diversification, and a geopolitical counterweight** to China and the U.S. This visit offers an opportunity to expand cooperation and overcome long-standing trade and investment hurdles.

What is the Significance of India-EU Relations?

- **Economic and Trade Relations:** The EU is among India’s **largest trading partners** (also, India is EU’s 9th largest trading partner), accounting for 12.2% of **India’s total trade** in 2023, surpassing both the **U.S. and China**.
 - Trade in goods between India and the EU grew by **90% in the last decade**, while **trade in services surged by 96% from 2020 to 2023**.
 - **Foreign direct investment (FDI)** from the EU is substantial, supporting India’s industrial growth, job creation, and technology transfer.
 - **Free Trade Agreement (FTA)** negotiations resumed in 2021 after a long deadlock, focusing on **tariff reductions, investment protection, and regulatory alignment**.
 - The EU seeks greater market access in India, while India aims for fewer trade barriers to boost exports and investments.
- **Security and Defense Cooperation:** The EU is expanding maritime cooperation with India, deploying a **liaison**

officer at the **Indian Navy’s Information Fusion Centre** in Gurugram.

- Both sides are exploring greater **defense technology** collaboration, with discussions on **joint military exercises** and **counterterrorism strategies**.
- The EU’s **Enhancing Security Cooperation in and with Asia (ESIWA)** initiative boosts security ties with Asia, including India, to safeguard key **Indian Ocean sea** lanes.
- Strengthening security ties in the **Indo-Pacific** aligns with India’s interests in countering **China’s expansionism** and enhances regional stability through European engagement.
- **Technology, Digital, and Infrastructure Cooperation:** The **India-EU Trade and Technology Council (TTC)** focuses on **semiconductors, Artificial intelligence (AI)**, and **clean energy technologies**.
 - The **India-Middle East-Europe Economic Corridor (IMEC)** aims to enhance global trade routes and **energy security**.
 - **EU-India cooperation in digital payments and fintech** is expanding, with discussions on **cross-border digital transactions**.
 - Strengthening technology ties ensures India’s leadership in innovation, promotes **digital transformation**, and reduces reliance on **China-led supply chains**.
- **Strategic Autonomy & Multi-Alignment:** US’ potential deal-making with **Russia and China** could alter global alignments, making it imperative for India to broaden partnerships.
 - The EU is a **stable and predictable partner**, offering economic and technological collaboration without security dependencies.
 - The **EU’s strategic autonomy** aims to reduce dependence on the US, aligning with India’s **multi-alignment** by ensuring economic, technological, and strategic cooperation without security entanglements.
- **Global Governance & Geopolitical Realignments:** The EU is reducing economic reliance on China, aligning with India’s strategy of **trade diversification**.
 - As transatlantic tensions rise, the EU seeks independent foreign policy engagements, **increasing India’s diplomatic leverage**.
 - Both partners advocate for a **rules-based order** in **multilateral institutions**, including the **G20, WTO, and UN Security Council**.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses

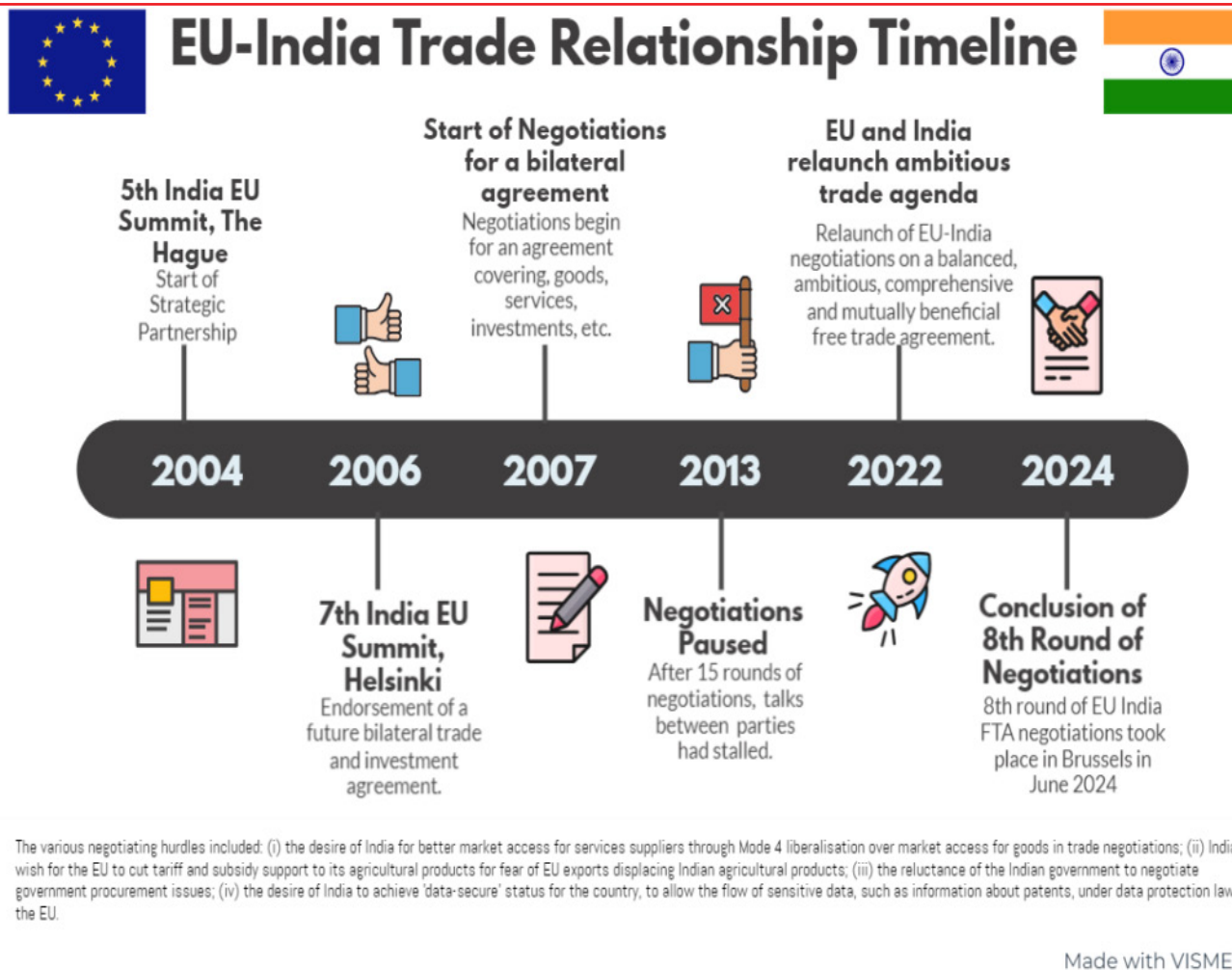


IAS Current
Affairs Module
Course



Drishti
Learning
App





Key India-EU Initiatives

- **Strategic Cooperation & Global Governance:**
 - **EU-India Strategic Partnership: A Roadmap to 2025:** Strengthens trade, investment, digitalization, climate change, security, global governance and climate resilience, ensuring sustainable growth and technological advancement.
 - Focuses on clean energy, connectivity, and security, enhancing India-EU cooperation across key economic sectors.
- **Energy & Climate Action:**
 - **EU-India Clean Energy and Climate Partnership:** Expands collaboration in renewable energy, smart grids, and clean technology financing for sustainable energy.
 - Supports climate adaptation and mitigation, enhancing India's role in the global green transition.
 - **EU-India Green Hydrogen Partnership:** Develops policy frameworks and pilot projects to promote green hydrogen and offshore wind energy.
 - Supports India's clean energy goals with a €1 billion European Investment Bank (EIB) fund.
 - **Sustainable Consumption & Production (SWITCH-Asia Programme):** Encourages eco-friendly manufacturing, waste management, and sustainable consumer practices.
 - Reduces environmental footprint, advancing circular economy initiatives.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



➤ **Trade & Economic Cooperation:**

- **EU-India Trade and Technology Council (TTC):** Enhances **digital governance, trade resilience, and green technology partnerships** for future-ready economies.
 - Strengthens **supply chain diversification**, reducing economic dependence on **single-market sources**.
- **Global Green Bonds Initiative:** Promotes **issuance of green bonds** to finance **sustainable infrastructure and climate projects**.
 - Enhances **climate finance frameworks**, attracting private investment in clean energy.

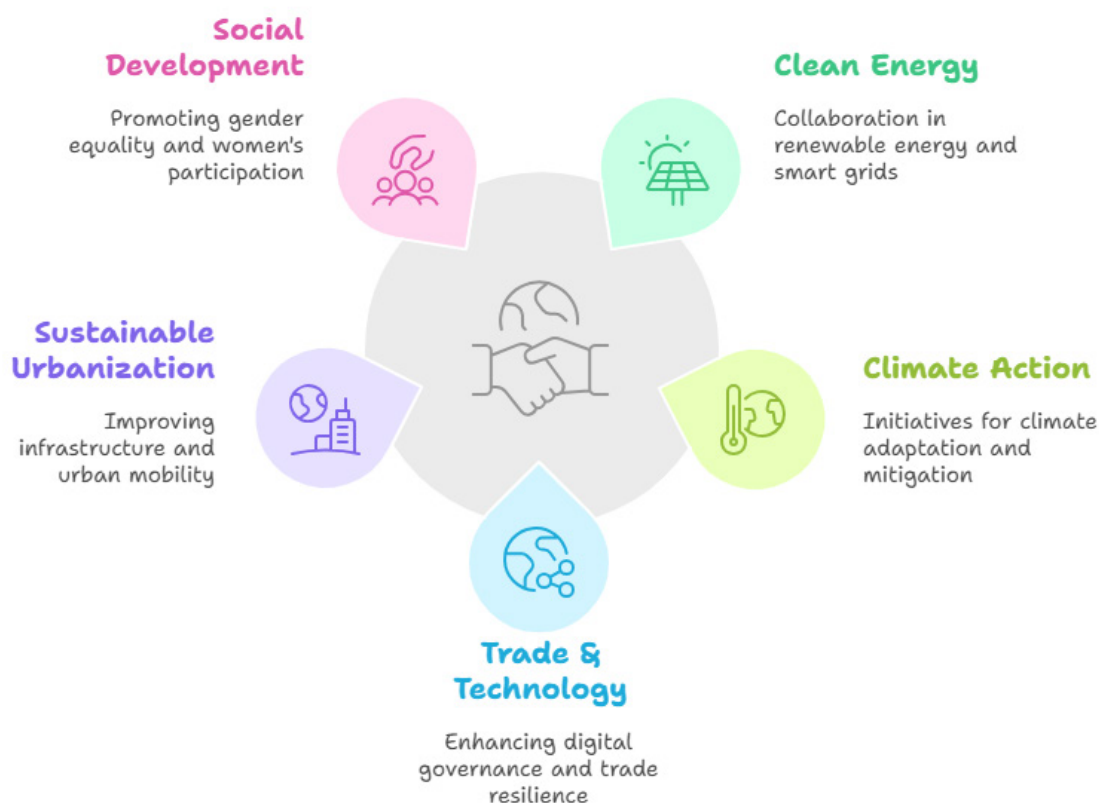
➤ **Sustainable Urbanization & Connectivity:**

- **EU-India Connectivity Partnership:** Enhances **digital and physical infrastructure**, improving **supply chains and logistics**.
 - Strengthens **transport networks, urban mobility, and cross-regional economic integration**.
- **India-EU Urban Forum:** It enables dialogue among officials, experts, and stakeholders to share best practices, policies, and innovative approaches for sustainable urban development.

➤ **Social Development & Gender Equality:**

- **WeEmpower India Initiative:** Strengthens **gender equality and women's participation in clean energy and sustainable industries**.
 - Supports **female entrepreneurship and inclusive business models**, boosting economic diversity.

India-EU Strategic Partnership Initiatives



Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



What Are the Challenges for India-EU Relations?

- **Stalled Free Trade Agreement (FTA) Negotiations:** EU demands lower tariffs on automobiles, spirits, and dairy, conflicting with India's domestic trade policies.
 - India seeks greater market access for **pharmaceuticals, IT services, and agricultural products**, facing strict EU regulations.
 - The **EU's Carbon Border Adjustment Mechanism (CBAM)** poses additional challenges for Indian exporters.
- **Investment Barriers & Regulatory Hurdles:** India's trade regulations remain restrictive, with **technical barriers to trade (TBT)** and **sanitary & phytosanitary (SPS) measures** affecting European businesses.
 - European investors seek a **more predictable policy** environment, particularly in investment protection agreements.
- **Data Privacy Regulations:** EU's strict data laws make digital exports from India costly and complex.
 - India lacks **EU data adequacy status**, restricting seamless data transfers, while small IT firms struggle with **high compliance costs, limiting competitiveness**.
 - Indian firms require expensive compliance mechanisms to access the EU market.
- **Foreign Policy Divergences:** The EU expects stronger Indian alignment on sanctions against Russia, while India maintains a **neutral stance, prioritizing diplomacy**.
 - India's **multi-alignment approach** with Russia, the U.S., and Europe leads to **occasional policy misalignments** with Brussels.
- **Limited Defense Cooperation:** India's **deep defense ties with Russia** and growing engagements with the U.S. leave little room for **European defense collaborations**.
 - The EU's fragmented **defense strategy** creates uncertainties in long-term security commitments.
- **Supply Chain Risks:** Despite India's efforts to diversify trade, China remains a major **economic player** for both India and the EU.
 - Building alternative supply chains requires **sustained investment and regulatory adjustments**.

What Should Be the Way Forward?

- **Fast-Track the FTA & Address Trade Barriers:** Prioritize resolving **tariff disputes**, particularly in **automotive, pharmaceuticals, and digital trade**.
 - Accelerating FTA talks will strengthen **supply chains, reduce trade barriers, and create alternative economic linkages**.
 - **Boosting high-tech exports** and facilitating greater **European investment** in India's manufacturing sector will drive economic growth.
- **Negotiating a Data-Sharing Framework:** India should negotiate an **EU-U.S.-style Privacy Shield** to enable smooth cross-border data flows.
 - A **mutual recognition framework** can reduce **compliance costs** for Indian firms, while domestic data compliance bodies will help them meet EU privacy norms efficiently.
 - Strengthening **cybersecurity laws** will enhance India's credibility in **global digital trade**.
- **Strengthen Defense & Security Ties:** Expand **joint naval exercises, cyber defense partnerships, and intelligence-sharing** mechanisms.
 - Align **India's Indo-Pacific strategy** with European defense priorities to counter China's regional assertiveness.
- **Develop Alternative Supply Chains:** Expand semiconductor and AI collaborations under the **India-EU Trade and Technology Council (TTC)**.
 - Strengthening the **IMEC** will create a new **trade and energy route** that bypasses China.
- **Enhance Digital & Green Technology Partnerships:** Increase cooperation in **renewable energy, fintech, and data privacy** regulations.
 - Expanding **cooperation in green hydrogen, electric vehicles, and carbon-neutral technologies** will benefit **both economies**.
 - Align **India's data protection** policies with the EU's standards to facilitate digital trade expansion.
- **Position India as a Global Diplomatic Balancer:** With the U.S.-Europe relations under strain, India can act as a **bridge between major powers**, fostering a balanced global order.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Engaging with the EU on multilateral platforms like the **G20**, **BRICS+**, and **UN Security Council reforms** will elevate India's global influence.
- **Reform Domestic Trade & Investment Policies:** India must simplify **regulatory frameworks**, **enhance infrastructure**, and **ensure policy stability** to attract European investments.
- Strengthening **intellectual property rights (IPR)** protections and ensuring ease of doing business will encourage **European tech firms** to establish R&D hubs in India.

Conclusion

The **India-EU partnership** is at a critical juncture, with **economic, security, and technological collaborations** shaping their future engagement. Addressing **trade disputes, regulatory barriers, and geopolitical divergences** will be key to realizing the full potential of this partnership. A stronger **India-EU alliance** will enhance global stability, drive economic resilience, and reinforce India's role in the evolving global order.



Enhancing PwD Inclusion in India

*This editorial is based on “**Clicking through barriers, empowering persons with disabilities**” which was published in The Hindu on 25/02/2025. The article brings into picture the exclusion of PWDs from India's digital economy despite legal safeguards.*

Tag: GS Paper - 2, Government Policies & Interventions, Welfare Schemes

As India advances toward a **\$1 trillion digital economy by 2028**, **Persons With Disabilities (PWDs)** remain significantly overlooked in digital inclusion policies. Despite frameworks like the **Digital Personal Data Protection Act, 2023** and **IS 17802 standards** (provide a set of accessibility requirements that specify how to make content accessible), PWDs face substantial barriers to accessing digital services. With approximately **70+ million PWDs in India**, the country requires **not just improved digital access but a holistic transformation across all**

sectors to ensure their meaningful participation. India must urgently reassess its inclusion strategies to create a society where **PWDs can fully participate with dignity and independence** in both digital and physical spaces.

What are the Key Provisions Related to Persons with Disabilities in India?

➤ Definition of Disability

- **Legal Definition:** The **Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995** defines disability as a condition causing impairment (**physical, mental, or sensory**) affecting normal functioning.

➤ Key Legislations:

- The **Rights of Persons with Disabilities (RPWD) Act, 2016**
 - Expands the definition of disability from 7 to 21 categories.
 - Emphasizes dignity, non-discrimination, and inclusion.
 - Guarantees rights related to education, employment, healthcare, accessibility, and legal capacity.
 - Provides **4% reservation** in government jobs and **5% in higher education institutions**.
- Other Relevant Laws
 - The **Rehabilitation Council of India Act, 1992** – Regulates rehabilitation services and professionals.
 - The **National Trust Act, 1999** – Supports persons with autism, cerebral palsy, mental retardation, and multiple disabilities.
 - The **Mental Healthcare Act, 2017** – Provides rights-based mental healthcare services.

➤ Related Landmark Cases:

- **Deaf Employees Welfare Association v. UoI (2013):** Directed equal transport allowance for hearing-impaired government employees, ensuring non-discrimination.
- **Union of India v. National Federation of the Blind (2013):** Clarified that **3% reservation** applies to vacancies in total cadre strength, not just identified posts.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Govt. of India v. Ravi Prakash Gupta (2010):** the Supreme Court ruled that job identification cannot be used to deny reservations to visually impaired candidates, ensuring fair appointments.
- **Suchita Srivastava v. Chandigarh Administration (2009):** Court upheld the reproductive rights of a mentally retarded woman, mandating consent for termination unless she is mentally ill.
- **Bhagwan Dass v. Punjab State Electricity Board (2003):** the Court ruled that employees acquiring disabilities cannot be terminated but must be given alternative employment under Section 47 of the PWD Act, reinforcing that PwD rights are a constitutional obligation, not charity.
- International Frameworks Supporting PwD Rights
 - **UN Convention on the Rights of Persons with Disabilities (CRPD) (2006)** – Ensures equal rights and non-discrimination.
 - **Salamanca Statement (1994)** – Promotes inclusive education.
 - **Asian & Pacific Proclamation on Disability (1992)** – Advocates full participation and equality.

What are the Key Issues Associated with PwDs in India?

- **Digital Exclusion and Accessibility Barriers:** Despite India's push for a \$1 trillion digital economy, **digital platforms, e-governance services, and fintech solutions remain largely inaccessible to PwDs due to lack of assistive technology and inclusive design.**
 - The **Digital Personal Data Protection (DPDP) Act, 2023**, by requiring 'verifiable consent' from a guardian, undermines the autonomy of PwDs rather than enabling their independent digital participation.
 - Most government websites and digital services do not comply with the **ICT Accessibility Standard IS 17802**, further marginalizing PwDs in the digital ecosystem.
 - According to the **Digital Empowerment Foundation (DEF) study (2024)**, only **36.61% of PwDs** regularly use digital services, often facing usability challenges.

- **Employment and Economic Marginalization:** Despite their potential, **PwDs face** significant barriers in employment due to workplace discrimination, inaccessible work environments, and limited vocational training opportunities.
 - India has almost 3 crore people with disability (PwD) of which around 1.3 crore is employable but only **34 lakh of them have been employed.**
 - Many companies prefer to **pay fines rather than comply with disability hiring norms**, and the informal sector remains largely unregulated in this regard.
- **Limited Inclusion in Healthcare and Social Welfare Schemes:** PwDs struggle to access healthcare due to **inaccessible hospitals, lack of specialized medical personnel, and inadequate disability-friendly health insurance policies.**
 - Most public health schemes, including **Ayushman Bharat**, **do not adequately cover assistive devices, rehabilitation therapies, or long-term disability care.**
 - Additionally, mental health services for PwDs remain highly underdeveloped.
 - Insurance coverage for persons with disabilities in India is lacking, leading to high **out-of-pocket health expenses** and access challenges.
 - Also, more than 1,400 complaints related to accessibility have been lodged through the government's flagship **Sugamya Bharat mobile application** since its launch in 2021.
- **Lack of Disability-Inclusive Urban Planning:** Despite the **Accessible India Campaign (Sugamya Bharat Abhiyan)** launched in 2015, **most public spaces, transport systems, and urban infrastructure remain inaccessible to PwDs.**
 - **Housing policies rarely mandate accessibility norms**, making even private accommodations difficult for PwDs.
 - A **2018 report** found that **only 3% of India's buildings** are fully accessible.
 - Also, currently, railway stations without proper ramps rely on either escalators or overcrowded lifts, which are frequently used by **able-bodied passengers.**

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Disproportionate Impact of Climate Change and Disasters:** PwDs are among the most vulnerable during **climate disasters** and **extreme weather events**, as evacuation protocols, emergency shelters, and relief measures rarely account for their needs.
 - Disaster management policies do not explicitly integrate disability-inclusive measures, leading to higher casualties and displacement among PwDs.
 - PwDs have **two to four times the mortality rate in acute-onset disasters** compared to the general populace.
- **Intersectional Marginalization: Gender, Rural-Urban Divide, and Caste Barriers:** Women with disabilities face **dual discrimination**—due to gender and disability—limiting their access to education, employment, and healthcare.
 - As many as 18 million persons with disabilities (**69% of the disabled population**) live in rural India and they experience **higher exclusion** due to lack of assistive technology and community awareness.
 - Additionally, PwDs from marginalized caste groups, such as Dalits and Adivasis, encounter **triple discrimination**, further exacerbating their social and economic exclusion.
 - Also, Only **23% of women with disabilities** are working as opposed to **47% of men with disabilities**.
- **Legal Identity and Bureaucratic Hurdles in Availing Benefits:** Many PwDs struggle to obtain a **Unique Disability ID (UDID)**, which is required for availing government benefits, due to bureaucratic inefficiencies and stringent disability assessment criteria.
 - Digital exclusion worsens this issue, as many **PwDs lack the means to apply online**.
 - Also, India's disability pension scheme is marred by poor compensation, strict verification demands, and exclusionary eligibility criteria.
 - However, **legal loopholes are also misused**, as evident in the **recent Pooja Khedkar case**.
- **Societal Stigma and Lack of Awareness:** Ableist attitudes and stereotypes about PwDs continue to persist, leading to **social exclusion, discrimination, and limited opportunities** in both personal and professional spheres.

- Cultural narratives often frame **disability as a liability rather than a condition requiring empowerment**, reinforcing dependence rather than inclusion.
 - Media representation of PwDs remains minimal and often portrays them in a patronizing manner.
- It is of the belief that PwDs require **'special care' rather than 'equal opportunities'**.
 - Recent **Supreme Court norms against offending disability depiction in films** and the guidelines provided for visual media, highlight the gravity of the issue.

What Key Measures to Enhance Inclusion and Empowerment of PwDs in India?

- **Digital and Technological Accessibility:** India must ensure **universal compliance with the ICT Accessibility Standard IS 17802** across government and private digital platforms.
 - All e-governance portals, fintech services, and educational platforms should be integrated with assistive technologies such as **screen readers, voice commands, and AI-driven accessibility tools**.
 - Public-private partnerships should focus on **subsidizing assistive technology devices** for PwDs to improve digital inclusion.
 - Expanding **remote digital service centers with trained personnel** can help PwDs in rural areas access essential digital services.
- **Strengthening Implementation of Disability Rights Laws:** A strict **monitoring and accountability mechanism** must be established to ensure **full enforcement of the Rights of Persons with Disabilities (RPwD) Act, 2016** across sectors.
 - Government institutions and private companies should be mandated to **submit annual disability-inclusion reports** on job reservations, accessibility, and welfare measures.
 - **Time-bound grievance redressal systems** should be created to address cases of non-compliance, discrimination, or denial of rights.
 - The **Office of the Commissioner for Persons with Disabilities** should be given **more autonomy and enforcement powers** to ensure policy implementation.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **Inclusive Employment and Workplace Policies:** A national-level **Disability-Inclusive Employment Policy** should be framed to mandate **workplace accessibility, flexible working hours, remote work options, and customized training programs** for PwDs.
 - Skill development initiatives under **Skill India and PMKVY** must include **tailored vocational training** for PwDs based on market demand.
 - A **disability employment index** should be introduced to track **inclusive hiring practices in both public and private sectors**.
 - **Startups and SMEs** should receive **tax incentives and financial support** for hiring and training PwDs.
- **Comprehensive Healthcare and Rehabilitation Services:** Healthcare services for PwDs must be integrated into **Ayushman Bharat and other national health schemes**, covering **assistive devices, therapies, and long-term rehabilitation**.
 - Disability-inclusive **telemedicine platforms** should be developed to provide **remote medical consultations, physiotherapy sessions, and mental health support**.
 - **District Disability Rehabilitation Centers (DDRCs)** should be strengthened with **specialized staff, advanced assistive technology, and community outreach programs**.
 - Insurance companies should be **mandated to offer disability-inclusive health policies** covering pre-existing conditions and assistive devices.
- **Accessible Urban Planning and Transport Systems:** The **Accessible India Campaign (Sugamya Bharat Abhiyan)** should be expanded with a **legally binding framework** for ensuring **barrier-free public infrastructure, transport systems, and housing**.
 - **All new smart city projects** must incorporate **disability-friendly design principles**, including **wheelchair-friendly pathways, tactile paving, voice-assisted crossings, and universal restroom access**.
 - Public transport systems, including buses, metros, and railways, must be mandated to provide **real-time accessibility support, low-floor entry, and audio-visual assistance**.
 - Affordable, accessible housing schemes should be developed under **PM Awas Yojana**, with mandatory disability-friendly features in all new constructions.
- **Disaster Resilience and Climate Adaptation for PwDs:** A **Disability-Inclusive Disaster Risk Reduction (DiDRR) framework** should be implemented to ensure **early warning systems, accessible shelters, and targeted evacuation strategies** for PwDs.
 - Disaster management agencies and NDRF teams should receive **specialized training on assisting PwDs during emergencies**.
 - Relief packages should include **assistive devices, medication, and personal care support** for PwDs affected by climate disasters.
 - Community-based **disaster preparedness programs** should involve PwDs in planning and execution, ensuring a **participatory approach**.
- **Addressing Intersectional Barriers: Women, Rural PwDs, and Caste Marginalization:** A **gender-sensitive disability framework** should be adopted to address the **unique challenges faced by women with disabilities, ensuring safe mobility, access to reproductive healthcare, and financial independence**.
 - Rural PwDs should be integrated into **Digital India and livelihood programs** through community-based digital literacy centers and localized entrepreneurship initiatives.
 - **Dedicated support groups and self-help collectives** should be formed at the village and district levels to empower PwDs through **peer networks and community mentorship**.
 - Local governance structures, such as **Gram Panchayats**, should include **PwD representatives** for better policy advocacy.
- **Simplifying Bureaucratic Processes for Legal Identity and Welfare Access:** The **Unique Disability ID (UDID) system** must be streamlined with **automatic Aadhaar integration** to reduce bureaucratic delays in accessing welfare benefits.
 - Doorstep **disability certification services** should be introduced to assist PwDs who face mobility challenges in obtaining official documents.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- A **single-window online platform** should be created to provide **all PwD-related welfare schemes, job opportunities, healthcare services, and legal aid** under one umbrella.
- The **inclusion of AI-driven chatbot services** can make welfare application processes more **user-friendly and accessible**.
- **Changing Social Perceptions and Promoting Disability Awareness:** A **nationwide disability sensitization campaign** should be launched to challenge ableist stereotypes and promote an inclusive mindset.
- **Schools and universities** should integrate **disability awareness modules** into their curriculum to create an **early culture of acceptance and empathy**.
- Mainstream media and the entertainment industry should be encouraged to feature **PwDs in positive, non-stereotypical roles** to change public perception.
- Celebrating **PwD achievements** (like Medal Winners of Paralympic Games) **through national awards and public recognition** can further encourage societal acceptance and empowerment.

Conclusion:

India's journey toward a **\$1 trillion digital economy and broader socio-economic transformation** must be truly inclusive, ensuring that **Persons with Disabilities (PwDs) are not left behind**. This requires a paradigm shift—from viewing disability inclusion as a compliance requirement to making it a **cornerstone of national development**. By embedding inclusivity at every level, India can build a future where PwDs participate with dignity, independence, and equal opportunity in all aspects of society.



Revamping Indian Railways

*This editorial is based on "**The bigger tragedy is the Railways and its systemic inertia**" which was published in The Hindu on 27/02/2025. The article brings into the picture Indian Railways' systemic failures, where negligence—not resource constraints—causes recurring tragedies.*

Tag: GS Paper - 3, Fiscal Policy, Government Policies & Interventions, Mobilization of Resources, Investment Models, Inclusive Growth

The recent New Delhi railway station stampede exposes systemic failures in **Indian Railways** that stem from indifference rather than resource constraints. Despite recurring tragedies at stations like **Elphinstone Road (2017)** and **Allahabad (2013)**, the organization has failed to implement basic crowd control measures and safety protocols. India urgently needs to address this **systemic inertia to prevent future tragedies from being dismissed** as unfortunate inevitabilities rather than preventable failures.

How the Indian Railway Contributes to the Indian Economy?

- **Backbone of National Transportation:** Indian Railways is the **lifeline of the country, providing affordable and reliable transport** to millions daily.
 - It facilitates the movement of both passengers and goods across vast distances, playing a crucial role in economic integration.
 - Indian Railways transports over **8 billion passengers annually**, making it one of the busiest railway networks globally.
 - During the **Covid-19 pandemic**, Indian Railways operated "**Oxygen Express**" trains to deliver medical oxygen across states, showcasing its **logistical strength**.
- **Economic Growth and Industrial Development:** Railways serve as a crucial driver of economic growth by facilitating **trade, commerce, and industrialization across the country**.
 - The transportation of raw materials like **coal, iron ore, cement, and agricultural produce** ensures the smooth functioning of industries.
 - Efficient rail logistics reduce supply chain costs, enhancing the competitiveness of Indian manufacturing and exports.
 - Mega infrastructure projects such as the **Dedicated Freight Corridors (DFCs)** aim to boost efficiency and economic productivity.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- **CAG (2021-22)** highlighted that coal alone accounts for **nearly 50% of railway freight earnings**, making industrial supply chains highly dependent on rail connectivity.
- **Employment Generation and Livelihood Support:** Indian Railways is one of the **largest employers in the world**, directly employing millions and indirectly supporting many more in ancillary industries.
 - It employs over 1.2 million people, **making it the world's ninth-largest employer**.
 - It provides **stable employment across various skill levels**, from engineers and technicians to station managers and track maintenance workers.
 - The expansion of railway infrastructure, station redevelopment, and manufacturing of new rolling stock create additional employment opportunities.
 - **Privatization and PPP models** in railways are expected to generate further job prospects in operations and logistics
- **Rural Connectivity and Regional Development:** Railways play a pivotal role in connecting remote and rural areas, integrating them with urban centers and markets.
 - **Improved railway infrastructure in underdeveloped regions** enhances accessibility to education, healthcare, and employment opportunities.
 - Special railway corridors such as the North-East Connectivity Project aim to boost regional development and national integration.
 - In FY 2023-24, the railways have decided to redevelop 1,275 railway stations under the **Amrit Bharat Station scheme**
 - The **Vande Bharata Express expansion to Tier-2 and Tier-3 cities** is a step toward improving accessibility and regional economic development.
- **Catalyst for Sustainable Development and Green Mobility:** Railways offer an **environmentally sustainable alternative to road and air transport by reducing carbon emissions** and fuel consumption.
 - The transition to **full electrification and renewable energy integration** aims to make **Indian Railways carbon-neutral by 2030**.
- **14 States/UTs** have been 100% electrified by Indian Railways as of July 2023.
- Energy-efficient locomotives, electrified routes, and green initiatives such as **bio-toilets** are improving the railway sector's sustainability footprint.
 - **Rail freight emits nearly 80% less greenhouse gas** per ton-kilometer than road transport, making it a key player in India's sustainable mobility strategy.
- **Strengthening National Security and Strategic Mobility:** Railways play a crucial role in national security by **ensuring rapid troop movement and defense logistics in border areas**.
 - Dedicated railway lines and freight corridors aid in the **quick mobilization of military supplies, vehicles, and personnel during emergencies**.
 - The construction of **strategic railway lines in border regions, particularly in the Northeast and Ladakh**, enhances defense preparedness.
 - The **Arunachal Frontier Highway** is a landmark infrastructure project, connecting **12 districts along the LAC with China**.
- **Urban Mobility and Decongestion of Road Networks:** The expansion of **metro rail and suburban rail systems in major cities** is reducing congestion and improving urban mobility.
 - Efficient mass transit options help reduce **travel time, pollution, and road accidents in densely populated areas**.
 - The integration of **metro, suburban, and regional rapid transit systems** is fostering seamless multimodal transport networks.
 - India achieved over 1,000 km of operational metro rail network, becoming the **world's third-largest metro system after China and the US**.
 - The **Rapid Transit System between Delhi and Meerut, set to open in 2025**, will significantly cut travel time between the two cities.
- **Boost to Tourism and Cultural Integration:** Railways enable affordable and convenient travel to India's diverse cultural, historical, and religious sites, promoting tourism.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Special trains such as **Bharat Gaurav Trains** and **luxury services like the Palace on Wheels** attract both domestic and international tourists.
 - Enhanced railway connectivity to **pilgrimage sites, heritage locations, and ecotourism destinations** boosts local economies.

What are the Key Issues Associated with Indian Railways?

- **Deteriorating Financial Health:** Indian Railways is facing severe financial stress due to a declining revenue surplus, increasing **reliance on extra-budgetary resources (EBR)**, and **unsustainable operating costs**.
 - The growing gap between **expenditure and revenue has led to reduced internal resource generation**, affecting long-term sustainability.
 - Additionally, **heavy cross-subsidization of passenger fares through freight earnings** has distorted pricing mechanisms, making freight transportation less competitive.
 - **CAG (2021-22) reported the worst-ever Operating Ratio of 107.39%**, meaning **Railways spent ₹107.39 to earn ₹100**, which would have been **109.36%** if pension and asset renewal expenses were included.
- **Infrastructural Deficiencies:** Frequent **derailments, stampedes, and collisions point to gaps** in infrastructure maintenance and safety oversight.
 - **Poor track renewal, outdated signaling systems, and overcrowded stations** increase the likelihood of accidents.
 - The huge backlog in asset replacement further exacerbates safety concerns, raising risks for millions of daily passengers.
 - CAG (2021-22) flagged a **₹34,318.79 crore backlog** in over-aged asset renewal.
 - The **Odisha Balasore triple train accident (June 2023)** highlighted critical gaps in railway safety and signaling systems.
 - The **'Kavach' anti-collision system**, designed to prevent crashes, has seen slow implementation, with coverage limited to select routes
- **Poor Crowd Management and Station Infrastructure:** Overcrowding at major railway stations, **lack of adequate holding areas, and ineffective crowd control measures** pose serious risks, especially during festivals or special events.
 - The **absence of proper barricading, unidirectional movement planning**, and emergency response mechanisms increases the likelihood of stampedes.
 - The **February 2025 New Delhi railway station stampede**, triggered by a last-minute train announcement, resulted in multiple casualties.
- **Freight Revenue Stagnation and Market Competition:** Freight operations, which subsidize passenger losses, **face increasing competition from road and air transport due to inefficiencies and high tariffs**.
 - Rail freight remains slow, lacks last-mile connectivity, and is heavily dependent on bulk commodities like coal, **limiting revenue diversification**.
 - The shift towards **renewable energy could reduce coal transportation demand**, impacting freight earnings further.
 - Govt records show that the rail share in freight transport has declined steadily from **85% in 1951, to 60% in 1991, and in 2022 it was only 27%**.
- **Environmental and Sustainability Challenges:** Despite electrification efforts, Indian Railways continues to rely on diesel locomotives in several regions, contributing to air pollution and carbon emissions.
 - The **push for 100% electrification is slow**, with delays in infrastructure development and power procurement.
 - **Waste management at stations and inside trains remains inadequate**, affecting cleanliness and sustainability goals.
 - India's transport sector contributes to **12%** of the country's greenhouse gas emissions with the railways accounting for about **4%**.
- **Lagging High-Speed Rail and Bullet Train Projects:** The ambitious **Mumbai-Ahmedabad bullet train project** has faced land acquisition hurdles, funding delays, and political opposition, setting back **India's high-speed rail plans**.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Slow execution of **semi-high-speed corridors (like Vande Bharat)** and **inadequate track upgrades** further limit speed improvements across conventional routes.
- The bullet train project connecting Mumbai to Ahmedabad will be ready by 2022, a decade later it is only 30% complete, and the **revised deadline is now 2028**.
- **Mismanagement of Railway PSUs and Financial Viability Issues:** Several Railway PSUs face declining **profitability, mismanagement, and inefficiencies**, affecting their ability to contribute to Indian Railways' growth.
 - While **some PSUs in financing and tourism have performed well**, others in construction and logistics have seen declining returns.
 - The **falling return on equity and rising dependence on loans** highlight deeper structural issues.
 - CAG (2021-22) reported that return on equity for railway PSUs declined from 9.17% in 2017-18 to **7.53% in 2019-20**.
- The **widespread implementation of automatic train control systems** like Kavach and centralized traffic control can significantly reduce human errors.
- Upgrading **signaling infrastructure with AI-based predictive maintenance** will enhance real-time monitoring.
- Comprehensive crowd management strategies, including better station design, holding areas, and **automated entry-exit points**, must be implemented.
- **Technological Advancements and Digitalization:** Implementing **AI-driven predictive maintenance, IoT-based asset monitoring**, and blockchain-enabled freight tracking can boost efficiency and reliability.
 - Expanding the **reach of real-time passenger information systems, smart ticketing solutions**, and integrated mobility apps will improve customer experience.
 - Upgrading railway workshops with automation and robotics will optimize rolling stock maintenance.
 - The **full integration of financial and operational data** under a unified digital platform will streamline railway administration.

What Measures can be Adopted to Revitalise Indian Railways?

- **Financial Sustainability and Revenue Optimization:** Indian Railways **must shift towards a sustainable financial model** by reducing dependency on extra-budgetary borrowings.
 - **Dynamic fare pricing, monetization of railway land assets**, and increased private sector participation (as per **Bibek Debroy Committee**) in station development can enhance revenue streams.
 - **Freight tariff rationalization and last-mile connectivity solutions** will make rail cargo more competitive.
 - Strengthening **Public-Private Partnerships (PPPs)** in infrastructure projects can reduce fiscal burdens.
- **Safety Enhancement and Infrastructure Modernization:** Railways must prioritize **track renewal, bridge strengthening, and station decongestion** to minimize accidents and improve operational efficiency.
 - The **freight basket** beyond coal by **tapping into containerized cargo, automobile logistics, and express freight services**.
 - **Dedicated Freight Corridors (DFCs)** must be expanded with seamless connectivity to ports, highways, and inland waterways.
 - **Rationalizing freight tariffs and reducing terminal handling times** will make rail transport cost-effective for industries.
 - A **National Logistics Grid under PM Gati Shakti** integrating rail, road, and ports must be fast tracked to facilitate end-to-end cargo movement.
- **High-Speed Rail and Semi-High-Speed Expansion:** The **Mumbai-Ahmedabad bullet train project** must be expedited while planning additional high-speed corridors along high-demand routes, building upon **Rakesh Mohan Committee (2010)**.
 - **Track upgradation projects**, including dedicated high-speed freight lines, should be prioritized.

Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



- Indigenous manufacturing of high-speed rolling stock will reduce procurement costs and **boost Make in India efforts**.
- **Land acquisition, financing models, and technology transfer agreements** should be streamlined for faster implementation of high-speed rail projects.
- **Railway Station Modernization and Urban Mobility Integration:** Stations must be transformed into **multimodal transit hubs with seamless connectivity to metro networks, bus terminals, and airports**.
- Infrastructure upgrades such as **elevated concourses, automated ticketing, and congestion-free passenger movement areas** are essential.
- Expansion of suburban and regional rail networks will decongest metros and provide faster commuting options.
- The **Indian Railway Station Development Corporation (IRSDC)** must be strengthened to accelerate station redevelopment projects.
- **Sustainable and Green Railways Initiative:** Achieving **100% electrification with renewable energy integration** will reduce dependency on fossil fuels and lower carbon emissions.
- Expanding **solar and wind power installations** across railway stations, workshops, and vacant land areas will enhance energy sustainability.

- **Hydrogen-powered and battery-operated locomotives** should be piloted as alternatives to diesel engines.
- Strengthening **carbon credit mechanisms and green financing** will support long-term sustainability goals..
- **Increased Private Sector Participation:** Following the recommendations of the **Bibek Debroy Committee**, Indian Railways should open more avenues for private sector participation.
- Private investments in rolling stock procurement, railway catering, and logistics parks will enhance service quality and efficiency.
- **Competitive bidding for high-demand routes** can improve financial viability while reducing operational burdens on the government.

Conclusion:

Indian Railways remains the backbone of India's transportation and economic infrastructure, but **systemic inefficiencies, financial strain, and safety lapses continue to hinder its full potential**. Addressing infrastructure deficits, enhancing crowd management, and prioritizing financial sustainability are crucial for long-term resilience. Leveraging technology, strengthening freight operations, and promoting green mobility can transform railways into a modern and efficient entity.



Prepare with DrishtiIAS

UPSC
Mains
Test Series
2025



UPSC
Classroom
Courses



IAS Current
Affairs Module
Course



Drishti
Learning
App



Drishti Mains Questions

1. Discuss the significance of ethanol blending in India's energy strategy. Highlight the key challenges faced in its implementation and suggest measures to address them.
2. What are the key challenges hindering agricultural productivity in India, and how can technological innovations, policy reforms, and sustainable practices address these issues?
3. Despite its strategic location and growing trade, India's shipping sector remains underdeveloped, impacting its global competitiveness. Analyze the key structural challenges and suggest policy measures for its revival.
4. Analyze the role of the MSME sector in driving India's economic growth, with special reference to employment generation and exports. What are the key challenges faced by MSMEs, and how can government policies and reforms address them for long-term sustainability?"
5. Examine the primary sources of emissions in India and the challenges in their mitigation. How can India achieve a balance between economic growth and environmental sustainability?
6. Despite various government initiatives, India's tribal communities continue to face socio-economic marginalization. Analyze the key challenges in tribal development and suggest a holistic strategy to ensure their sustainable and inclusive growth.
7. India's engagement with the Middle East is evolving beyond energy trade to encompass strategic partnerships, infrastructure projects, and defense cooperation. Discuss the key drivers of this shift and the challenges India faces in deepening its ties with the region.
8. Discuss the role of artificial intelligence in governance and analyze the challenges associated with its regulation in India. Also, suggest measures to establish a robust AI governance framework while balancing innovation and ethical concerns
9. India's fintech revolution is reshaping financial intermediation, often bypassing traditional banking structures. In this context, critically examine whether fintech is democratizing finance or deepening digital and economic divides.
10. "The Governor's office in India has often been at the center of debates on federalism and constitutional propriety. Discuss the challenges associated with the role of the Governor and suggest reforms to ensure impartiality and accountability." (250 words)
11. Amid shifting global geopolitics, India and France have deepened their strategic engagement across multiple domains. Analyze how historical ties, defense cooperation, and emerging areas of collaboration shape this partnership.
12. Forest fires in India have increased significantly over the past two decades, posing serious environmental, economic, and social challenges. Discuss the key factors contributing to the rising frequency of forest fires in India.
13. Assess the strategic significance of the Indian Ocean Region (IOR) in the context of India's foreign policy. How can India enhance its influence in the region amidst growing geopolitical competition?

Drishti Mains Questions

14. Discuss the evolving dynamics of India-US relations, highlighting key areas of cooperation and challenges. How can both nations address trade imbalances while strengthening strategic ties?
15. Climate change has intensified the frequency and severity of natural disasters in India. Analyze how climate resilience and disaster preparedness can be integrated into India's governance framework.
16. Discuss the significance of the 'Make in India, Make for the World' initiative in positioning India as a global manufacturing hub. What challenges hinder its success, and what strategic measures are needed to enhance its effectiveness?
17. Analyze the role of Article 355 and Article 356 in maintaining constitutional order. How can their misuse be prevented while ensuring governance stability?
18. How can Indian cities balance rapid urbanization with inclusive growth and equitable access to resources?
19. "India's soil degradation crisis threatens agricultural productivity, ecological balance, and food security. Examine the major causes, consequences, and suggest strategic measures for sustainable soil management
20. Assess the factors weakening the effectiveness of the RTI Act and propose measures to enhance its transparency and accountability.
21. What are the key impediments in India-EU relations, and how can both sides overcome them to build a more resilient partnership?
22. Despite legal provisions, the employment rate of PwDs in government and private sectors remains low. Analyze the challenges and suggest measures to enhance their workforce participation.
23. The financial health of Indian Railways has been a persistent concern, with declining revenue surplus and heavy cross-subsidization of passenger fares. Suggest a roadmap for making Indian Railways financially sustainable.