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Content

Emerging Cyber Threats and Their Implications

This editorial is based on "Cyber cons go from digital arrests to wedding scams" which was published in Livemint on 29/11/2024. The article brings into picture the growing sophistication of cybercrime, from fake wedding invitation scams to 'digital arrests,' highlighting the urgent need for stronger digital awareness and robust cybersecurity measures.

Tag: GS Paper - 2, Government Policies & Interventions, GS Paper - 3, Cyber Security, Cyber Warfare, Challenges to Internal Security Through Communication Networks

In the ever-evolving landscape of **cybercrime**, fraudsters are pioneering increasingly sophisticated methods that prey on digital vulnerabilities, from the **invented concept of 'digital arrest'** to manipulative scams like fake wedding invitations on WhatsApp. As Indians grapple with these emerging threats, the boundaries **between virtual and real-world fraud become increasingly blurred**, exposing deep systemic challenges in our digital infrastructure. The proliferation of these scams underscores a critical need for **comprehensive digital awareness and robust cybersecurity mechanisms** that can anticipate and neutralize evolving criminal strategies.

What is the Current Framework for Cyber Security in India?

- **Legislative Measures:**
  - **Information Technology Act, 2000 (IT Act):** This foundational legislation provides the **legal framework for electronic governance and addresses cybercrimes and electronic commerce.**
    - It has been amended to i**ncorporate provisions related to data protection and cybersecurity.**
  - **Digital Personal Data Protection Act, 2023:** Enacted t**o protect personal data,** this act outlines the **rights of individuals and the obligations of data fiduciaries** in processing personal data.
    - It emphasizes lawful processing, data minimization, and accountability.
- **Institutional Framework:**
  - **Indian Computer Emergency Response Team (CERT-In):** Operating under the **Ministry of Electronics and Information Technology,** CERT-In is the national nodal agency for responding to computer security incidents.
    - It issues advisories, conducts training, and facilitates coordination among stakeholders.
  - **National Critical Information Infrastructure Protection Centre (NCIIPC):** NCIIPC focuses on protecting critical information infrastructure in sectors like power, banking, and telecom.
    - It develops strategies and policies to safeguard these assets.
  - **Indian Cyber Crime Coordination Centre (I4C):** Launched by the **Ministry of Home Affairs,** I4C addresses cybercrime through a coordinated approach, including a national cybercrime reporting portal and capacity-building initiatives.
  - **Cyber Swachhta Kendra:** Established in February 2017, the Cyber Swachhta Kendra aims to create a secure cyber ecosystem in India by **detecting and mitigating botnet infections and malware**, in line with the National Cyber Security Policy.
  - **Cyber Surakshit Bharat:** An initiative of the Ministry of Electronics and Information Technology (MeitY) was conceptualised with the mission to **spread awareness about cyber-crime** and **build capacities of Chief Information Security Officers (CISOs**) and frontline IT officials, across all government departments.
- **Strategic Initiatives:**
  - **National Cyber Security Policy, 2013:** This policy outlines the vision and strategies for securing cyberspace, promoting a secure computing environment, and enhancing the resilience of national critical information infrastructure.

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- **Bharat National Cybersecurity Exercise 2024:** The exercise includes **immersive training on cyber defense and incident response, live-fire simulations of cyberattacks** on IT and OT systems, and collaborative platforms for government and industry stakeholders.

- **Sector-Specific Regulations:**
  - **Cybersecurity and Cyber Resilience Framework for SEBI Regulated Entities:** Issued by the Securities and Exchange Board of India, this framework mandates regulated entities to establish robust cybersecurity and cyber resilience policies to protect securities markets.
  - **Telecommunications (Critical Telecommunication Infrastructure) Rules, 2024:** Introduced in November 2024, it mandates telecom entities labeled as **Critical Telecommunication Infrastructure (CTI)** to provide government-authorized personnel access to i**nspect their hardware, software, and data.**

What are the Key Emerging Cyber Threats Affecting India's Digital Landscape?

- **Digital Arrest Scams:** Cybercriminals have devised a new method of fraud, **impersonating law enforcement officials to instill fear in unsuspecting victims.**
  - These fraudsters contact individuals, claiming they are under investigation for fabricated crimes, and coerce them into paying hefty fines to avoid fictitious arrests.
  - By exploiting the authority associated with law enforcement and the victim's lack of digital literacy, these scams have become alarmingly effective.
  - **In 2024, Indians collectively lost a staggering ₹120.30 crore to such "digital arrest" fraud**.
- **Ransomware Attacks:** Ransomware attacks have escalated, targeting **critical infrastructure and financial institutions**, leading to operational disruptions and financial losses.
  - In **August 2024,** a ransomware attack on **C-Edge Technologies** disrupted payment systems across nearly 300 small Indian banks, highlighting vulnerabilities in financial networks.
  - Also, **2023 ransomware attack on the All India Institute of Medical Sciences (AIIMS)** in Delhi exemplifies the vulnerabilities in healthcare infrastructure
- **Supply Chain Attacks:** Cybercriminals are increasingly exploiting vulnerabilities in supply chains to infiltrate larger networks.
  - For instance, in **December 2020**, a global cyberattack targeting SolarWinds, a US-based software company offering network management tools, impacted multiple Indian organizations, including the **National Informatics Centre (NIC), the Ministry of Electronics and Information Technology (MeitY)**, and **Bharat Heavy Electricals Limited (BHEL).**
  - India suffered cyber fraud losses amounting to **Rs 11,333 crore** in the first nine months of 2024, according to data from the Indian Cyber Crime Coordination Centre (I4C)
- **State-Sponsored Cyber Espionage:** Nation-state actors are intensifying cyber **espionage activitie**s, targeting sensitive government and corporate data.
  - A cyber-attack originating from China was identified as the cause behind the massive power outage in **Mumbai** in 2020, exposing vulnerabilities in the city's critical infrastructure.
- **Deepfake Technology Exploitation:** The misuse of AI-generated **deepfakes** poses significant threats, including misinformation and fraud.
  - A 2024 report identified deepfakes as an imminent threat in India, capable of undermining public trust and manipulating information.
  - A deep fake video depicting actress **Rashmika Mandanna** in explicit content surfaced online, causing widespread outrage.

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- **Exploitation of Internet of Things (IoT) Devices:** The widespread adoption of **Internet of Things (IoT) devices** has **significantly increased the vulnerability of digital ecosystems,** creating new opportunities for cybercriminals.
  - These devices, often lacking robust security features, are easily exploited to breach networks or conduct malicious activities.
  - In 2024, **India witnessed a staggering 59% rise in IoT-related cyberattacks,** underscoring the scale of this emerging threat.
  - From smart homes to connected industrial systems, the risks associated with unsecured IoT devices have escalated.
- **Cryptocurrency and Blockchain-Based Cyber Fraud:** The explosive growth of cryptocurrency adoption in India has created a **new, largely unregulated landscape for sophisticated cyber fraud mechanisms.**
  - Blockchain-based platforms are increasingly becoming targets for complex **Ponzi schemes, pump-and-dump manipulations**, and advanced money laundering techniques that exploit regulatory gray areas.
  - A **Bengaluru-based Bitcoin scam** exposed a nexus between a **hacker, police officials, and a cyber expert**, involving the illegal transfer of cryptocurrency worth **₹850 crore,** tampering of evidence, and allegations of corruption
- **Dark Web-Enabled Cybercrime:** The dark web remains a hub for illegal trading of stolen data and malicious tools.
  - Hackers are selling customized malware and ransomware kits on the dark web, making sophisticated attacks accessible to less-skilled threat actors.
  - A recent security breach has **exposed the personal data of 750 million telecom users in India**, with the data being sold on the dark web.

What Measures can be Adopted to Enhance the Cybersecurity Landscape in India?

- **Nationwide Cyber Literacy Campaigns:** Digital literacy campaigns should be rolled out in **regional languages, targeting vulnerable populations like rural communities and senior citizens.**
  - These initiatives can teach users to verify identities, recognize scams, and use secure payment systems.
  - Partnerships with schools, colleges, and local governance bodies can amplify impact.
- **Mandatory Security Protocols for IoT Devices:** Introduce enforceable standards **requiring manufacturers to integrate security-by-design principles** in IoT devices.
  - This includes firmware updates, encrypted communication, and tamper-proof mechanisms.
  - Certification from a **regulatory authority can ensure only secure devices reach the market.** Public awareness about IoT risks will further enhance security at the consumer level.
- **AI-Driven Threat Intelligence and Response Systems**: Deploy AI-based tools in critical sectors to **analyze network traffic, identify anomalies, and respond to threats in real time.**
  - These systems can predict ransomware attacks and neutralize vulnerabilities before exploitation.
  - AI can also enhance forensic investigations, aiding faster response to incidents. Regular testing of AI systems ensures accuracy and reliability.
- **Strengthen CERT-In Capabilities:** Expand CERT-In's mandate to include **deeper collaboration with international CERTs** and the private sector, aligning efforts with international frameworks such as the **Budapest Convention on Cybercrime.**
  - Introduce **regional CERT hubs for faster response to localized incidents.** Equip CERT-In with cutting-edge tools for threat detection, and advanced forensics.
  - Proactively issue advisories and simulation exercises to improve institutional resilience.

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- **National Deepfake Detection and Regulation Framework**: Develop **Ethical-AI tools** capable of identifying deepfake content in real time.
  - Establish **penalties for creating and disseminating harmful deep fake media** under updated IT laws.
  - Collaboration with **social media platforms to flag and remove such content can reduce its spread.** Public awareness campaigns should educate people on recognizing manipulated media.
- **District-Level Cybersecurity Response Units:** Establish dedicated cybersecurity cells in every district equipped with trained personnel and forensic tools.
  - These units can **handle smaller-scale scams like digital arrest fraud quickly** and coordinate with CERT-In for larger issues.
  - Community engagement programs can build trust and encourage timely reporting of incidents.
- **Supply Chain Cybersecurity Certification:** Introduce a certification system for supply chain partners to ensure they adhere to cybersecurity best practices.
  - This includes **regular audits, blockchain integration, secure software development practices,** and encrypted communication channels.
  - Large enterprises should demand these certifications from vendors. This minimizes risks of breaches infiltrating through smaller entities.
- **Cryptocurrency Regulations:** Establish clear regulations for **cryptocurrency transactions,** focusing on transparency and traceability.
  - **Mandatory KYC for crypto exchanges** and real-time monitoring systems can prevent illegal activities.
  - Specialized crypto forensic units should address fraud swiftly.
- **Mandatory National Cybersecurity Audits:** Regular, government-mandated audits can identify and fix vulnerabilities in critical infrastructure systems.
  - Incorporating **stress tests, penetration tests, and employee training ensures comprehensive readiness**.
  - These audits should be compulsory for sectors like healthcare, banking, and utilities. Results can be used to prioritize resource allocation for better protection.
- **Cyber Hygiene Awareness for Startups:** Introduce government-supported **cybersecurity training programs tailored for startups**.
  - Subsidized access to cybersecurity tools and services can enable small businesses to adopt best practices.
  - **Awareness campaigns about the risks of poor security hygiene** can motivate startups to prioritize investments in protection. Sector-specific guidance ensures relevance.
- **Proactive Dark Web Monitoring:** Invest in tools that actively monitor the dark web for **stolen data, illegal goods, and malware sales**.
  - **Intelligence gathered from dark web activity** can preempt attacks and guide law enforcement operations.
  - Public-private collaboration can expand monitoring capabilities. Dedicated task forces should act swiftly on identified threats.
- **Multi-Factor Authentication (MFA) Enforcement:** Mandate MFA across critical systems, government portals, and financial platforms to reduce reliance on passwords alone.
  - Businesses should adopt adaptive MFA systems to enhance user experience without compromising security. This minimizes unauthorized access risks.
- **Cybersecurity for Education Sector:** Introduce cybersecurity awareness and defense mechanisms in schools and universities. This includes **regular backups, secure networks, and training staff to handle threats.**

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- National programs can provide resources for smaller institutions to enhance their defenses. Involving students in awareness campaigns builds a culture of cybersecurity early.

- **Implementing Data Localization Norms:** Although the **Digital Personal Data Protection Act, 2023** includes provisions for data localization, these **should not remain mere formalities on paper** but must be implemented in both letter and spirit.
  - Mandating that **critical and sensitive data remain stored within national borders** can improve control and reduce security risks.
  - Clear compliance frameworks and penalties for violations should be enforced.

Conclusion:

The evolving landscape of cybercrime necessitates a **comprehensive and proactive approach.** India needs to strengthen its cybersecurity infrastructure**, promote digital literacy, and foster international collaboration to combat these threats effectively.** By investing in robust security measures, building a skilled workforce, and staying ahead of emerging threats, India can safeguard its digital future and protect its citizens from the growing risks of cyberattacks.

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Promise and Perils of Legalizing MSP

This editorial is based on "Unrest over minimum support prices" which was published in The Financial Express on 28/11/2024. The article brings into picture the growing agrarian distress as farmers demand a legal guarantee for MSPs to counter declining incomes and rising risks. It highlights the need for alternatives like deficiency payments and direct income support to ensure sustainability and food security.

Tag: GS Paper - 2, Government Policies & Interventions, GS Paper - 3, Direct & Indirect Farm Subsidies, Public Distribution System (PDS), Buffer Stocks & Food Security, Agricultural Marketing

Agrarian distress in India remains a pressing issue, with **farmers demanding a legal guarantee for minimum support prices (MSPs) for 23 crops** to address their declining incomes and rising risks from climate change and high input costs. The fiscal and inflationary implications of a legally mandated MSP regime make it infeasible, prompting calls for **alternatives such as deficiency price payments (DPPs) or direct income support**. Addressing these demands requires balancing farmers' incomes with sustainable agricultural practices and food security imperatives.

What is the Minimum Support Price?

- **MSP:** The **Minimum Support Price (MSP) system** was introduced in **1965** with the establishment of the **Agricultural Prices Commission (APC),** later renamed the **Commission for Agricultural Costs and Prices (CACP).**
  - This system was designed to intervene in the market to safeguard national food security and protect farmers from significant price drops.
- **MSP Calculation:** The CACP calculates three categories of production costs for each crop, considering both state-level and national averages:
- **A2:** This includes all direct costs incurred by the farmer, such as expenses for seeds, fertilizers, pesticides, hired labor, leased land, fuel, irrigation, etc.
- **A2+FL:** This category adds the estimated value of unpaid family labor to the A2 costs.
- **C2:** This is a more comprehensive cost calculation, incorporating the cost of owned land, rental, and interest on fixed capital assets, in addition to A2+FL.
  - The government asserts that **MSP is set at least 1.5 times the all-India weighted average Cost of Production (CoP)**, but this is calculated based on **1.5 times the A2+FL cost.**
- **Crops Covered under MSP:** MSP supports farmers by guaranteeing a pre-determined price for **23 mandated crops.** Additional MSPs are fixed for **Toria** (based on rapeseed & mustard) and **de-husked coconut** (based on copra).

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MINIMUM SUPPORT PRICE (MSP)

The rate at which the govt. purchases crops from farmers; based on a calculation of at least 1.5x the cost of production incurred by the farmers

RECOMMENDED BY

Commission for Agricultural Costs & Prices (CACP) (recommends MSPs for 22 mandated crops and Fair and Remunerative Price for Sugarcane)

22 MANDATED CROPS

(14 Kharif, 6 Rabi and 2 Other Commercial crops)

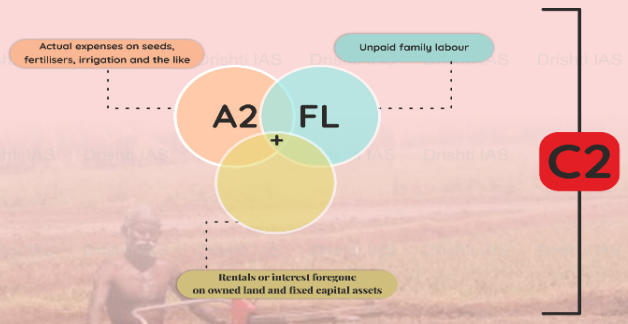
- **7 CEREALS** — Paddy, Wheat, Barley, Jowar, Bajra, Maize And Ragi
- **5 PULSES** — Gram, Arhar/tur, Moong, Urad And Lentil
- **7 OILSEEDS** — Groundnut, Rapeseed/mustard, Soyabean, Sunflower, Sesamum, Safflower And Niger Seed
- RAW COTTON
- RAW JUTE
- COPRA

MSP is the price at which the govt. is supposed to procure the mandated crops from farmers if the market price falls below it

FACTORS FOR RECOMMENDING MSP

- Cost of cultivation
- Demand-Supply situation for the crop
- Market price trends
- Inter-crop price parity
- Implications for consumers (inflation)
- Environment (soil and water use)
- Terms of trade b/w agri and non-agri sectors (ratio of farm inputs and outputs)

Considers both A2+FL and C2 costs



MSP has no statutory backing — a farmer cannot demand MSP as a matter of right

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What are the Arguments in Favour of Legalising MSP?

- **Protecting Farmers Against Market Volatility:** Legalizing MSP **ensures farmers receive fair compensation** despite unpredictable price fluctuations in open markets, safeguarding them from losses caused by surplus production or global trade dynamics.
  - For example, in **2024**, **tomato farmers in Andhra Pradesh** faced distress sales due to a price crash, with legal MSP, such disparities can be avoided.
  - More than **85% farmers are either small or marginal w**ith average land holding of just about **0.36 ha, highly vulnerable to price volatility.**
- **Promoting Regional and Crop Equity:** Legalizing MSP can **address regional disparities** by ensuring fair remuneration for farmers in underrepresented states and promoting cultivation of non-cereal crops like pulses and oilseeds.
  - Currently, **procurement is skewed towards Punjab and Haryana,** leaving states like Bihar and Odisha marginalized.
  - For example, **80% of the wheat procured in 2021-22 was from the three states of Punjab, Madhya Pradesh and Haryana.** Legalizing MSP would help reduce this disparity by **ensuring equitable procurement across all regions.**
- **Mitigating Rural Distress and Farmer Self-harm:** In the NCRB data released in **December, 2023,** it was reported that **6,083 agricultural labourers passed away in 2022** as a result of taking their own lives.
  - Legal MSP can alleviate rural distress by **ensuring farmers a predictable income,** reducing dependence on credit and lowering the incidence of farmer self-harm.
- **Encouraging Agricultural Investments:** With assured returns through legalized MSP, farmers would feel **incentivized to invest in better seeds, technologies, and sustainable practices**.
  - For example, **FRP for sugarcane (8% higher in 2024-25 than 2023-24 price) ensured profitability, encouraging investment in inputs and increasing productivity.**
- **Reducing Exploitation by Middlemen:** The **Shanta Kumar Committee's 2015 report** reveals that just **6% of farmers benefit from the Minimum Support Price**, meaning that 94% of farmers do not gain the intended advantages of the MSP.
  - A legalized MSP can bypass the exploitative practices of intermediaries who dominate agricultural markets.
- **Tackling Climate-Driven Agricultural Risks:** With climate change increasing weather unpredictability, legalized MSP ensures income stability for farmers affected by crop losses.
  - For example, **unseasonal rains, hailstorms, and strong winds have damaged over 5.23 lakh hectares of wheat crops in Punjab, Haryana, Uttar Pradesh, and Madhya Pradesh** in 2023, causing harvest challenges and concerns over significant yield losses.
- **Strengthening India's Agricultural Exports:** A legal MSP framework provides a predictable pricing regime, helping align production with global demand and boosting exports.
  - For instance, In 2022–23, the **country's rice exports totaled $11 billion, with basmati rice experiencing a notable 21.9%** growth in export value for 2023–24.
  - Such measures can reduce trade imbalances and enhance India's global agricultural competitiveness.

What are the Arguments Against Legalising MSP?

- **Fiscal Burden on the Exchequer:** Implementing a legally mandated MSP across all eligible crops would **significantly strain the government's finances.**
  - CRISIL Market Intelligence & Analytics estimated that the "real cost" of MSP guarantee for the government would be approximately **₹21,000 crore in the Agriculture Marketing Year (MY) 2023.**
  - This figure represents a **substantial portion of India's total budgeted expenditure,** raising concerns about fiscal sustainability.

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- **Implementation Challenges in Unregulated Markets:** A significant portion of **agricultural transactions occur outside regulated mandis,** complicating the enforcement of a legal MSP.
  - In Maharashtra, a 2018 attempt to **mandate MSP led to trader boycotts.** This highlights the practical difficulties in monitoring and enforcing MSP across diverse and informal market channels.
- **Inflationary Pressures:** Mandating higher crop prices through legal MSP can contribute to **food inflation,** adversely affecting consumers, especially the economically vulnerable.
  - Economists note that **a 1% increase in MSP can lead to a 15 basis points rise in inflation**, impacting overall economic stability.
- **International Trade Implications:** Legalizing MSP may conflict with **World Trade Organization (WTO) norms on agricultural subsidies**, potentially leading to trade disputes.
  - India has previously invoked the **WTO's Peace Clause** for exceeding subsidy limits on rice, indicating the **delicate balance required in subsidy policies to avoid international repercussions.**
- **Risk of Inefficient Resource Allocation:** Legal MSP could incentivize farmers to grow **MSP-backed crops like rice and wheat disproportionately,** exacerbating issues like groundwater depletion and soil degradation.
  - Punjab and Haryana have lost a **staggering 64.6 billion cubic metres of groundwater in the 17 years between 2003 to 2020.** Legal MSP risks deepening this unsustainable resource usage.
- **Negative Environmental Consequences:** MSP-supported **monoculture**, particularly of **water-intensive crops like paddy and sugarcane**, has been linked to biodiversity loss, soil salinity, and greenhouse gas emissions.
  - For example, **sugarcane in Maharashtra consumes 70% of the state's irrigation water**. Legal MSP may inadvertently exacerbate such environmental issues.
- **Overburdening Government Procurement Mechanisms:** Legalizing MSP would necessitate **universal procurement,** potentially overwhelming storage capacities and distribution systems.
  - **India's food grain production stands at 311 MMT, but the storage capacity is only 145 MMT,** resulting in a shortfall of 166 MMT. While other countries have 131% surplus storage capacity, **India faces a 47% shortfall.**
  - Increasing procurement through legal MSP would further strain these already stressed systems.
- **Lack of Complimentary Market Reforms:** Legal MSP would focus on price guarantees **without addressing deeper structural issues in agricultural markets**, such as inefficient **Agricultural Produce Market Committee(APMC)** systems and lack of direct farmer-market linkages.
  - APMC mandis are concentrated in certain regions, leaving vast areas without access to regulated markets.
  - For instance, **India has only one mandi for every 496 square kilometers,** far below the National Commission on Farmers' recommendation of **one mandi for every 80 square kilometers.**

What Measures can be Adopted to Strengthen the MSP System in India?

- **Implement a Deficiency Price Payment (DPP) System:** The government can **compensate farmers for the gap between MSP and market prices** through a direct transfer mechanism.
  - This reduces fiscal burden by avoiding large-scale procurement while ensuring farmers receive fair compensation.
  - States like **Madhya Pradesh have experimented with the Bhavantar Bhugtan Yojana, d**emonstrating its feasibility.
  - Implementing DPP nationwide, **combined with digital platforms for real-time price tracking,** can bridge income gaps effectively.
- **Promote Decentralized Procurement Mechanisms:** Decentralizing procurement to involve **state governments and local self-help groups** ensures wider geographical coverage and equitable benefit distribution.

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- For example, **Chhattisgarh's decentralized procurement of paddy** has proven successful in involving local farmers.
- Decentralization can address regional disparities in procurement while reducing logistical pressures on central storage systems.

➢ **Enhancing APMCs:** Modernizing **Agricultural Produce Market Committees (APMCs) and integrating them with e-NAM (National Agriculture Market)** can create transparent and competitive marketplaces, building upon **Gujarat's APMC reforms and Model APMC Act.**

- **Increasing the number of APMC markets, improving their efficiency, and providing farmers with digital literacy** can empower them to negotiate better prices while reducing middlemen exploitation.

➢ **Encourage Crop Diversification Through MSP Incentives:** Higher MSPs for **pulses, oilseeds, and millets** can shift focus from water-intensive crops like rice and sugarcane.

- This aligns with sustainable agriculture goals, reducing environmental degradation.
- The success of government programs **promoting millets in the International Year of Millets (2023)** highlights the potential of tailored MSPs to incentivize diversification and support agroecology.

➢ **Adopt Climate-Resilient Support Mechanisms:** Introduce climate-smart MSPs that factor in risks like **erratic rainfall and pest attacks.**

- The system can **link MSP determination with insurance schemes such as PMFBY (Pradhan Mantri Fasal Bima Yojana)** to create a safety net for climate-vulnerable farmers.
- Establishing localized MSP for **drought-resistant crops** can also reduce the economic impact of climate-related crop failures.

➢ **Strengthen Farmer Producer Organizations:** FPOs can play a critical role in pooling resources and negotiating better market access for small and marginal farmers.

- **Linking FPOs with MSP operations** ensures collective bargaining power, reduces dependence on intermediaries, and facilitates direct market linkages.
- This approach also aligns with the **government's objective of creating 10,000 FPOs under the Atmanirbhar Bharat initiative.**

➢ **Integrate Sustainable Practices with MSP:** Make MSP conditional on adherence to **sustainable agricultural practices like reduced chemical fertilizer use, crop rotation, and organic farming**.

- Incentivizing farmers through a **"green MSP"** linked to sustainability metrics can address environmental concerns.
- Pilot programs like **Zero Budget Natural Farming (ZBNF) in Andhra Pradesh** can guide nationwide implementation.

➢ **Expand Warehousing and Storage Capacities:** Investing in **modern warehousing infrastructure through public-private partnerships** can address the significant storage deficit.

- Expanding cold storage chains for perishable crops ensures MSP coverage for horticultural products.
- Improved storage **facilities minimize post-harvest losses and ensure better price realization for farmers.**

➢ **Integrate MSP with Export Strategies:** Align MSP policies **with export-oriented production to enhance global competitiveness.**

- Encouraging crops like **basmati rice and certain oilseeds**, backed by MSP and quality certification, can boost agricultural exports.
- This reduces the fiscal burden of domestic procurement and strengthens India's agricultural trade balance.

➢ **Develop Crop-Specific Processing and Value Addition Units:** Link MSP-procured crops to **agro-processing industries to enhance value addition and minimize wastage.**

- For instance, setting up pulse-processing units in key production areas can generate income for farmers and create rural employment.
- This aligns with schemes like **PM Kisan Sampada Yojana, which seeks to strengthen post-harvest infrastructure.**

➢ **Incorporate Technological Solutions for Real-Time Price Discovery:** Leverage **Artificial Intelligence (AI) and blockchain technologies** to develop platforms that monitor real-time market prices and provide transparency in MSP implementation.

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- These platforms can also **help predict price trends, aiding farmers in better crop selection and reducing market exploitation**.

- **Provide Graded MSP for Quality Produce:** Introduce a tiered MSP structure based on **crop quality,** encouraging farmers to invest in better seeds and post-harvest handling.
  - For example, **higher MSP for premium-grade grains can incentivize the production of export-quality commodities.**
- **Expand Direct Benefit Transfers (DBT) to Replace Input Subsidies:** Streamlining **input subsidies (fertilizers, seeds) into direct cash transfers** allows farmers to invest flexibly in production while reducing government expenditure.
  - This model, successfully piloted in **Telangana's Rythu Bandhu scheme,** can be scaled up nationwide and linked with MSP guarantees to ensure income support.
- **Enhance Monitoring and Grievance Redress Mechanisms:** Establish dedicated MSP monitoring committees to oversee implementation, **address farmer grievances, and ensure timely payments**.
  - A robust system for agricultural markets can bring accountability and transparency to the process.
- **Promote MSP for Emerging Agricultural Sectors:** Expand MSP coverage to include new-age crops like **quinoa, flaxseed, and medicinal plants**, reflecting changing consumer demand and export potential.
  - This diversifies farmers' income sources and aligns India's agricultural strategy with global trends.

Conclusion:

The debate on legalizing MSP highlights the complex interplay between **farmer welfare, fiscal sustainability, and food security.** A balanced approach, including DPPs, decentralized procurement, market reforms, and sustainable practices, is crucial to **ensure a win-win situation for both farmers and the government.** By addressing the underlying issues of **market imperfections, climate risks, and low incomes**, India can create a robust and sustainable agricultural system that benefits all stakeholders.

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India's Position in the Shifting Nuclear Order

This editorial is based on "Behind the making of the global nuclear (dis)order" which was published in The Hindustan Times on 03/12/2024. The article brings into picture the unraveling of the global nuclear order, as key powers and ongoing conflicts like Russia-Ukraine and Israel-Hamas challenge arms control norms, with nuclear weapons used for geopolitical leverage. For India, this emerging disorder poses a complex strategic challenge in a volatile, multi-nuclear neighborhood.

Tag: GS Paper - 2, GS Paper - 3, Nuclear Technology, Government Policies & Interventions, Effect of Policies & Politics of Countries on India's Interests

The **global nuclear order** is rapidly unraveling, with key powers like **Russia, China, the US, and emerging actors challenging long-standing norms** and arms control agreements. The **Russia-Ukraine** **and** **Israel-Hamas conflict** has dramatically exposed the fracturing of international nuclear restraint, with nuclear weapons being used as tools of geopolitical coercion and battlefield intimidation. For India, this emerging nuclear disorder presents a **particularly complex challenge,** with potential pressures on its strategic posture from an increasingly **volatile and multi-nuclear neighborhood.**

How Global Nuclear Order is Evolving?

- **Geopolitical Rivalries Reshaping the Nuclear Balance:** The intensification of U.S.-China strategic competition is **redefining nuclear postures globall**y.
  - China's rapid nuclear buildup, including its development of **hypersonic glide vehicles**, signifies a shift from a minimum deterrence strategy. This challenges the **U.S.'s deterrence capability in the Indo-Pacific.**
  - As of 2024 **China reportedly possesses 500+ operational nuclear warheads.**
  - U.S. military aid to Taiwan and enhanced **AUKUS cooperation** reflect counter-balancing efforts in the region.

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- **Technological Disruptions Amplifying Strategic Instability:** Advancements in **Artificial Intelligence (AI), cyberwarfare, and space-based systems** have increased vulnerabilities in nuclear command and control.
  - Emerging technologies undermine traditional doctrines of **Mutually Assured Destruction (MAD).**
  - For example, **Elbit Systems, an Israeli defense technology company** with a significant presence in the UK, uses AI to develop advanced defense systems
  - In June 2024, Slingshot Aerospace announced a partnership with **DARPA** to develop **Agatha**, **an AI-powered system designed to identify potentially dangerous space vehicles** within large satellite constellations.
- **Rise of Nuclear Arm Race**: The resurgence of the nuclear arms race is evident in the **fragmentation of the Non-Proliferation Treaty (NPT) framework,** with growing non-compliance and diminished credibility.
  - **Iran's nuclear enrichment activities** exceeding the Joint Comprehensive Plan of Action (JCPOA) limits have emboldened other nations to question the treaty's efficacy.
  - Regional tensions further exacerbate the issue, as the **Indo-Pak rivalry intensifies with Pakistan's tactical nuclear weapons** focus and India's development of the **Agni-V ICBM,** while **China's rapid buildup to 500 nuclear warheads surpasses both India's 172 and Pakistan's 170.**
- **Growing Cyber Threat to Nuclear Infrastructure:** Nuclear security concerns are rising due to the potential **to exploit weak cyber safeguards.**
  - Cyberattacks on nuclear infrastructure and proliferation of dual-use technologies increase the threat of nuclear terrorism.
  - In 2009, **Stuxnet malware** reportedly destroyed nearly **one-fifth of Iran's nuclear centrifuges** and was allegedly linked to the CIA and Mossad.
- **Erosion of Multilateral Arms Control and Disarmament Institutions:** Global arms control regimes are weakening as major powers undermine multilateral agreements.
  - The **Conference on Disarmament (CD) has been stalled for decades**, and the **Treaty on the Prohibition of Nuclear Weapons (TPNW)** is getting ignored by nuclear-armed states.
- **Integration of Civilian Nuclear Programs in Military Strategies:** The dual-use nature of nuclear technology is increasingly exploited.
  - Nations like **South Korea are enhancing civilian nuclear capabilities,** which could serve as latent deterrence mechanisms.
  - Also, **Japan** has announced its intention to develop and build next-generation nuclear power plants in a major shift from the country's **post-Fukushima disaster policy.**

What is India's Stance Regarding the Use of Nuclear Weapons?

- **Peaceful Use of Nuclear Energy:** India strongly advocates for the p**eaceful use of nuclear energy for power generation, medicine, and industry.** It emphasizes nuclear energy as a sustainable solution to meet its growing energy demands while reducing carbon emissions.
  - As of 2023, India operates 22 nuclear reactors with a total capacity of 6,780 MW.
  - India is a **signatory to the Convention on Nuclear Safety.**
- **Commitment to No First Use (NFU) Policy:** India adheres to a **No First Use policy,** ensuring that nuclear weapons are only used as a deterrent and in retaliation to a nuclear attack.
  - **India's 2003 Nuclear Doctrine reaffirmed the NFU policy,** although it left room for changes in response to evolving threats.
  - India's nuclear weapons program is aimed at maintaining credible minimum deterrence, **ensuring strategic stability.**
- **Strategic Autonomy in Non-Proliferation:** India is **not a signatory to the Nuclear Non-Proliferation Treaty (NPT)** but aligns with its goals while rejecting its discriminatory nature.
  - India was **granted a waiver by the Nuclear Suppliers Group (NSG) in 2008,** allowing it to engage in nuclear commerce despite being a non-NPT signatory.

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- India has signed civil nuclear cooperation agreements with **France, the United States, Russia, Namibia, Canada, Argentina, Kazakhstan etc.**

- **Active Role in Global Non-Proliferation Initiatives:** India supports non-proliferation efforts through strong domestic safeguards and international collaboration.
  - It has committed to the **International Atomic Energy Agency (IAEA) safeguards** for its civilian nuclear facilities.
  - India voluntarily placed some civilian nuclear facilities under IAEA safeguards.
- **Balancing Civilian and Strategic Needs:** India maintains a careful balance between its **civilian nuclear energy program and its strategic nuclear arsenal.**
  - India's indigenous **three-stage nuclear power program leverages thorium reserves,** emphasizing self-reliance in civilian nuclear energy.
  - Strategic facilities like **Bhabha Atomic Research Centre (BARC)** underscore India's emphasis on indigenous development.
- **Emerging Role in Climate Goals:** India increasingly **views nuclear energy as critical to achieving its climate commitments under the Paris Agreement.**
  - It plans to expand its nuclear energy portfolio as part of its net-zero emissions goal by 2070.
  - **Nuclear power contributes about 3% of India's electricity generation** but is projected to grow significantly in the next decade.

What Threats that India Faces Due to Shift in Global Nuclear Order?

- **Erosion of Global Arms Control Agreements:** The collapse of key arms control treaties, like **suspension of NewSTART,** creates an environment of nuclear proliferation and arms races, impacting India's security landscape.
  - The lack of global norms increases **risks of regional arms build-up**
  - **India's non-membership in the NSG**, due to Chinese opposition, limits its access to advanced nuclear technology for civilian use.
- **Tactical Nuclear Threats in Conventional Conflicts: Pakistan's doctrine of "Full Spectrum Deterrence"** and its deployment of tactical nuclear weapons heighten risks of escalation during conventional conflicts.
  - The possibility of nuclear use in a localized war undermines regional stability.
- **Increased Vulnerability Due to Emerging Technologies:** Advancements in hypersonic missiles, cyberwarfare, and AI-driven targeting systems increase India's vulnerability.
  - Cyberattacks on critical infrastructure, such as the reported malware at India's **Kudankulam nuclear power plant in 2019,** underscore vulnerabilities.
- **Shifting Alliances in a Multipolar World:** Emerging alliances like the China-Russia strategic partnership and nuclear technology exchanges with Pakistan could destabilize India's regional security.
  - These partnerships **could lead to shared technologies or coordinated policies against India.**
  - **Russia's deployment of nuclear-capable Iskander-M missiles in Belarus** mirrors similar Russian support to Pakistan for nuclear cooperation in the past.
- **Pressure on India's NFU Policy:** India's No First Use (NFU) policy faces challenges as evolving threats from adversaries necessitate recalibration.
  - Tactical nuclear deployments by **Pakistan and China's assertiveness may force India to reconsider its defensive posture.**
- **Economic and Environmental Risks from Nuclear Developments:** Shifts in global nuclear energy policies, coupled with India's ambitious nuclear energy expansion, pose economic and environmental challenges.
  - Nuclear accidents in conflict zones (**e.g., Zaporizhzhia in Ukraine**) highlight risks of nuclear fallout affecting neighboring regions.

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What Steps Can India Take to Address the Growing Nuclear Threat?

- **Strengthen and Modernize India's Nuclear Deterrence:** India must invest in modernizing its nuclear arsenal, including the **development of advanced delivery systems like hypersonic missiles and MIRV (Multiple Independently Targetable Reentry Vehicle)** technologies.
  - This will ensure a credible deterrent against evolving threats from China and Pakistan.
  - Enhance submarine-launched **ballistic missile (SLBM) systems** for survivable second-strike capability, leveraging the **INS Arihant-class.**
- **Improve Cybersecurity for Nuclear Infrastructure:** To mitigate risks of cyberattacks, India must **implement state-of-the-art cybersecurity protocols** and establish a dedicated agency to protect nuclear infrastructure from digital threats.
  - Regular audits, simulations, and collaborations with global cybersecurity agencies are essential
  - Learn from incidents like the Kudankulam malware attack (2019) and **integrate AI-driven monitoring systems.**
- **Reassess and Refine the No First Use (NFU) Policy:** While maintaining NFU as a cornerstone, India should introduce conditional flexibility to its nuclear doctrine to enhance strategic ambiguity and deter adversaries from exploiting its defensive posture.
  - This refinement can deter limited nuclear use by Pakistan or China's assertive nuclear policies.
  - **Clarify conditions for "massive retaliation" in response to non-nuclear threats** like biological or chemical attacks.
- **Accelerate Indigenous Development of Nuclear Technology:** India must prioritize self-reliance in nuclear energy b**y fast-tracking its three-stage nuclear program,** emphasizing thorium-based reactors.
  - This reduces dependence on imports and ensures resilience amid global supply chain disruptions.
  - Scale up **Advanced Heavy Water Reactor (AHWR) projects** for thorium utilization.
  - Invest in R&D for **next-generation small modular reactors (SMRs)** to decentralize nuclear energy production.
- **Strengthen Nuclear Command and Control Systems:** India should upgrade its **nuclear command and control infrastructure** to ensure robust decision-making capabilities during crises.
  - This includes improving communication systems and ensuring the survivability of its leadership and critical assets.
  - Incorporate AI-based early-warning systems to reduce reaction times.
- **Advocate for Global Arms Control and Disarmament:** India must take the lead in advocating for a **new global framework on arms control to address emerging threats like hypersonic missiles and AI-driven weapon systems**.
  - This enhances India's diplomatic credibility and aligns with its commitment to nuclear disarmament
  - Revive **discussions on the Rajiv Gandhi Action Plan (1988)** for global nuclear disarmament.
  - Collaborate with **like-minded nations in forums like the G20** to build consensus on banning destabilizing technologies.
- **Leverage Quad and Other Regional Alliances for Strategic Advantage:** Through Quad and similar platforms, **India can address nuclear risks in the Indo-Pacific region by enhancing intelligence sharing,** joint military exercises, and maritime security.
  - Incorporate **nuclear-risk mitigation exercises in Quad's annual Malabar naval exercises.**
  - Partner with **Japan and Australia to strengthen nuclear supply chain security** in the region.
- **Promote Public Awareness and Transparency in Nuclear Policy:** India must educate its citizens about **nuclear safety and its strategic doctrine to ensure public confidence** and prevent panic during crises.
  - Transparency in policy enhances national cohesion and deters adversaries from exploiting misinformation.
  - Publish periodic wLeverage Multilateral Diplomacy for Nuclear Security:

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- **Leverage Multilateral Diplomacy for Nuclear Security:** Actively engage with the **International Atomic Energy Agency (IAEA)** to enhance global nuclear safety and security standards, ensuring compliance and cooperation.
  - Advocate for **reforms in the Nuclear Suppliers Group (NSG)** to secure India's inclusion, **enabling access to advanced nuclear technologies and materials.**
  - Collaborate with international coalitions to address emerging challenges such as hypersonic missile proliferation and AI-driven nuclear systems.

Conclusion:

The unraveling global nuclear order poses significant challenges for India. To navigate this complex landscape, India must strengthen its **nuclear deterrence, modernize its arsenal, and invest in cybersecurity**. Simultaneously, India must engage in **diplomatic efforts to revive global arms control and advocate for a nuclear-weapon-free world.** By striking a balance between strategic autonomy and international cooperation, India can safeguard its security interests and contribute to a more stable and peaceful world.

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Reimagining Plastic Waste Management in India

This editorial is based on "A cut in time: On the plastic pollution problem" which was published in The Hindu on 05/11/2024. The article brings into picture the deadlock in the UN's Global Plastics Treaty, highlighting the divide between developed nations advocating production cuts and developing countries, like India, opposing them over economic concerns. It underscores India's recycling gap, managing only a third of its annual plastic waste, emphasizing the need for improved waste management.

Tag: GS Paper - 3, Conservation, Environmental Pollution & Degradation, Government Policies & Interventions

The global endeavor to address **plastic pollution** through the **UN Environment Programme's Global Plastics Treaty** has reached an impasse, revealing deep divisions between nations on how to tackle this environmental menace. While developed countries and island nations advocate for **stringent production cuts** to combat the pervasive environmental and health risks of plastic, **many developing countries, including India, resist such measures, viewing them as economic threats.** India's current plastic recycling capacity stands at **merely one-third of its annual plastic introduction**, underscoring the critical need for a comprehensive and proactive approach to plastic waste management.

What are the Major Domains in India Relying Heavily on Plastic?

- **Packaging Industry:** Accounting for approximately **59% of India's plastic consumption**, the packaging sector relies heavily on both rigid and flexible plastics for their durability and cost-effectiveness.
  - The surge in **e-commerce and retail** has amplified the demand for plastic packaging solutions.
  - For instance, the widespread use of plastic packaging during the Covid-19 pandemic facilitated the safe distribution of essential goods.
- **Building and Construction:** This **sector utilizes plastics in pipes, insulation, and fittings** due to their corrosion resistance and longevity.
  - The government's **"Housing for All" initiative** has further propelled the use of plastic materials in affordable housing projects, enhancing construction efficiency and reducing costs.
- **Automotive Industry:** Plastics are **integral in manufacturing automotive components** like dashboards, bumpers, and fuel tanks, aiding in weight reduction and fuel efficiency.
  - The push towards **electric vehicles (EVs)** has intensified the adoption of lightweight plastic materials to extend battery life and performance.
  - Companies like Tata Motors have incorporated advanced plastic composites in their EV models to achieve these goals.

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- **Agriculture**: The agricultural sector employs plastics in applications such as **drip irrigation systems, greenhouse films, and mulching**, which enhance water conservation and crop yields.
  - The **Pradhan Mantri Krishi Sinchayee Yojana** promotes micro-irrigation techniques, increasing the demand for plastic-based solutions to improve agricultural productivity.
- **Healthcare:** Plastics are vital in producing **medical devices, disposables, and packaging, ensuring hygiene and patient safety.**
  - The **Covid-19 pandemic** underscored the importance of plastic in manufacturing **personal protective equipment (PPE) kits, syringes, and vaccine vials,** facilitating mass immunization efforts across the country.

What Challenges Are Emerging from the Mismanagement of Plastic Waste in India?

- **Environmental Degradation:** Plastic waste in India amounts to nearly **9.3 million** tonnes annually, with **40% of it remaining uncollected**, severely impacting rivers, soil, and marine ecosystems.
  - Rivers like the **Ganga** **significantly contribute to a major chunk of global riverine plastic pollution,** disrupting aquatic biodiversity and food chains.
  - Plastics take up to **500-1000 years to degrade,** resulting in microplastic contamination in drinking water sources, posing a grave threat to ecosystems.
- **Public Health Crisis:** Plastic pollution significantly contributes to **respiratory diseases due to open burning,** releasing harmful carcinogenic chemicals like **dioxins and furans.**
  - Additionally, microplastics have infiltrated the human food chain through **water, seafood, and salt,** raising serious concerns about long-term health risks such as **endocrine disruption and infertility.**
  - In 2024, India to be among **top 4 contributors of microplastics released into water bodies**
- **Economic Burden:** India recycles **60% of its plastic waste—much higher than the global average of 9%.**
  - However, this is primarily driven by the **informal sector**, which employs **1.5 million waste pickers** working in hazardous conditions, with little access to healthcare, insurance, or fair wages.
  - This perpetuates **socio-economic marginalization.** Moreover**, plastic pollution incurs heavy costs for India's economy** in the form of lost fisheries, tourism revenue, and damage to urban infrastructure. .
- **Regulatory Gaps:** Despite the ban on certain **single-use plastics introduced in July 2022** and the **establishment of Extended Producer Responsibility (EPR) regulations,** compliance remains weak due to limited monitoring and enforcement.
  - Small-scale manufacturers, who make up 90% of the plastics industry, face high compliance costs, **leading to resistance and ineffective transition to eco-friendly alternatives.**
  - A new Centre for Science and Environment report uncovers **70,000 fake certificates and low registration of major polluters,** and banned items like plastic cutlery continue to be produced.
- **Climate Change Nexus:** Plastics are **petroleum-based and their production and incineration** contribute significantly to greenhouse gas emissions. India's increasing reliance on plastics in sectors such as **packaging, agriculture (e.g., mulch films), and e-commerce exacerbates** the nation's carbon footprint.
  - Additionally, **energy-intensive recycling processes undermine India's climate goals under the Paris Agreement.**
- **Socio-Cultural Barriers:** India faces significant **behavioral challenges in reducing plastic usage**, as single-use plastics are deeply embedded in everyday consumption patterns.
  - Public awareness about alternatives and proper waste segregation remains insufficient, limiting the success of government initiatives.
  - Cultural practices, such as **mass consumption during festivals, lead to seasonal spikes in plastic waste,** overwhelming municipal systems.
  - Brihanmumbai Municipal Corporation (BMC) recovered **363 metric tonnes (MT) of solid waste** from seven beaches in Mumbai after Ganesh Chaturthi in 2024.

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- **Lack of Circular Economy Solutions:** India's waste management infrastructure remains inadequate for **handling the growing plastic burden.**
  - Only **12-15% of plastic waste is scientifically processed,** while the rest is dumped in landfills or waterways.
  - Innovative technologies such as **pyrolysis and bioplastics**, which could improve plastic waste management, are **underutilized due to high costs and insufficient public-private partnerships.**

What is the Current Plastic Waste Management Framework in India?

- **Plastic Waste Management Rules, 2016**: Focus on minimizing waste generation, preventing littering, and ensuring segregation and proper disposal. It introduces Extended Producer Responsibility (EPR) for producers, importers, and brand owners. The minimum thickness of plastic carry bags is raised to 50 microns, with rural areas also included for implementation.
- **Plastic Waste Management (Amendment) Rules, 2018**: Phases out non-recyclable, non-energy recoverable, or non-reusable multi-layered plastic (MLP). Introduces a registration system for producers under the Central Pollution Control Board (CPCB).
- **Plastic Waste Management Amendment Rules, 2021**: Bans specific single-use plastics by 2022 and mandates EPR for packaging waste. Increases carry bag thickness to 120 microns by December 2022.
- **Plastic Waste Management (Amendment) Rules, 2022**: Sets mandatory recycling and reuse targets, imposes environmental compensation for non-compliance, and promotes a circular economy.
- **Plastic Waste Management (Amendment) Rules, 2024**: Specifies registration, reporting, and certification requirements for manufacturers and importers. Expands definitions of "importer" and "producer," mandates certification for biodegradable and compostable plastics, and requires reporting of pre-consumer plastic waste.

What Measures can India Adopt to Effectively Manage Plastic Waste?

- **Strengthen Waste Segregation at Source:** Segregating plastic waste at the household and institutional levels is essential for **effective recycling and disposal.**
  - Implementing community-based models with robust incentives and penalties can ensure greater compliance.
  - **Urban local bodies (ULBs) should be equipped and funded to invest in digital monitoring tools** to track waste segregation and processing.
  - For instance, cities like **Indore**, through extensive awareness and monitoring, achieved **100% source segregation**, becoming a model for urban waste management in India.
- **Enhance Recycling Infrastructure and Circular Economy:** Expanding **mechanized recycling units and adopting advanced technologies** like pyrolysis and chemical recycling can improve plastic waste processing rates.
  - Partnerships with **startups and the informal sector can drive innovation in recycling.**
  - Reliance becomes the **first in India to chemically recycle plastic waste-based pyrolysis** oil into **International Sustainability and Carbon Certification (ISCC)-Plus certified circular polymers**, can serve as a role model.
- **Promote Biodegradable and Alternative Materials:** Investing in research and development (R&D) for biodegradable plastics and alternatives such as **jute, hemp, and bamboo-based packaging** can reduce dependence on conventional plastics.
  - Government subsidies and tax benefits for eco-friendly startups can encourage industry adoption.
  - Consumer and business education about these alternatives is also crucial.
- **Strengthen Extended Producer Responsibility (EPR) Framework:** Mandating stringent EPR compliance ensures producers, importers, and brand owners finance the collection and recycling of plastic waste they generate.
  - **Regular audits and digital tracking tools** can ensure accountability. Financial penalties for non-compliance and incentives for exceeding targets should be introduced.

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- The Ministry of Environment, Forest, and Climate Change (MoEFCC) has approved new **Environmental Compensation (EC) guidelines** to enhance waste tyre management.
  - Manufacturers failing to meet their Extended Producer Responsibility (EPR) targets will face penalties of up to **Rs 8.40 per kg of waste tyres,** which can serve as a model for other sectors.

- **Integrate the Informal Sector into Formal Waste Management:** India's informal sector recycles major of its plastic waste, but workers often lack safety equipment, fair wages, or financial stability.
  - Formalizing this sector by **providing training, safety gear, and integrating them into ULB contracts** can improve efficiency while ensuring social equity.
  - Waste cooperatives and microfinancing options can empower these workers.
  - **Pune-based SWaCH**, for instance, **employs over 3,000 waste pickers,** processing 50,000 tonnes of waste annually while providing dignified livelihoods.
- **Leverage Technology and Data Analytics:** Deploying AI-driven sorting machines, GPS-enabled waste collection systems, and blockchain for tracking EPR compliance can streamline plastic waste management.
  - Real-time data on **collection, processing, and leakage into ecosystems** can improve decision-making and resource allocation.
  - Mobile apps for citizen engagement can enhance transparency.
- **Develop Waste-to-Energy Plants:** Establishing **waste-to-energy (WTE) plants** can convert non-recyclable plastic waste into energy, reducing landfill pressure and contributing to renewable energy targets.
  - Stringent environmental controls are necessary to prevent toxic emissions during combustion.
    - Public-private partnerships can effectively finance and operate these plants.
  - **Hyderabad's Jawahar Nagar WTE plant,** can serve as a model.
- **Educate and Mobilize Communities:** Community-led waste management models foster a culture of responsibility and action at the grassroots level.
  - **School programs, awareness campaigns, and incentivized initiatives** can motivate citizens to adopt sustainable waste practices.
  - Local self-help groups can play a crucial role in spreading awareness and organizing waste collection drives.
  - **Alappuzha's "Clean City" initiative**, which engaged residents in decentralized waste management, earned the **UN's recognition.**
- **Legislate and Monitor Plastic Use in Industry:** Industries like **agriculture (mulch films)** and logistics depend on plastics, requiring sector-specific regulations to optimize use while minimizing leakage.
  - Encouraging industries to adopt **lightweight, reusable, or degradable packaging** options through tax incentives and mandatory recycling quotas can help mitigate plastic waste.
- **Foster International Collaboration and Financing:** Collaborating with global organizations for **knowledge-sharing and accessing international green funds** can support innovation and infrastructure in waste management.
  - Participating in global initiatives like the **Global Plastic Action Partnership** provides technical and financial assistance.
  - India's active participation in the **Intergovernmental Negotiating Committee for Plastics Treaty** is a step forward in addressing global plastic pollution.

Conclusion:

India stands at a critical juncture in addressing its plastic waste challenge, requiring a **holistic approach that balances economic imperatives with environmental sustainability.** The path forward demands collaborative efforts across government, industry, and civil society, with a focus on **developing circular economy solutions and promoting sustainable alternatives.** Ultimately, India's success in managing plastic waste will not only mitigate environmental risks but also **position the nation as a global leader in sustainable development.**

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Making Water Management Effective in India

This editorial is based on "A holistic approach to water conservation" which was published in The Hindu Business Line on 05/12/2024.The article brings into picture the critical depletion and uneven distribution of India's water resources, highlighting unsustainable practices that could lead to a severe water deficit by 2050. It underscores the need for urgent reforms in conservation, efficient usage, and transformative strategies like micro-irrigation and water recycling to ensure sustainable development.

Tag: GS Paper - 2, Government Policies & Interventions, GS Paper - 3, Agricultural Resources, Water Resources, Conservation of Resources

India's water resources are under critical pressure, with finite supplies and uneven distribution threatening future economic and ecological stability. Current water management strategies, heavily reliant on groundwater extraction and large dam construction, are proving unsustainable, with **54% of groundwater wells declining** and **78% of monsoon rainwater flowing unused into oceans**. The country faces a stark water deficit by 2050, where total water consumption is projected to exceed available supply, **necessitating urgent shifts towards comprehensive demand-side management** and water conservation.

What is the Current Framework for Water Management in India?

- **Constitutional Provisions**
  - **State List:** Water is primarily a State subject (Entry 17, List II of the Seventh Schedule), allowing states to legislate on water supply, irrigation, canals, and drainage.
  - **Union List:** The Centre has jurisdiction over inter-state rivers and river valleys (Entry 56, List I).
  - **Article 21 of the Constitution indirectly recognizes the Right to Water** as a part of the Right to Life.
- **Legislative Framework**
  - **Environment Protection Act, 1986:** Regulates water pollution and mandates environmental clearances for water-intensive projects.
  - **Water (Prevention and Control of Pollution) Act, 1974:** Establishes water quality standards and penalizes pollution.
    - Provides for the establishment of the **Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs).**
  - **Inter-State River Water Disputes Act, 1956:** Facilitates the resolution of disputes over sharing inter-state river waters through tribunals.
- **Institutional Mechanisms**
  - **Ministry of Jal Shakti:** Formed by merging the Ministries of Water Resources and Drinking Water & Sanitation. It oversees the planning and implementation of water resources programs.
  - **Central Water Commission (CWC):** Manages water resource development and flood forecasting.
  - **Central Ground Water Board (CGWB):** Monitors and regulates groundwater resources.
- **Key Policies and Programs**
  - **National Water Policy (2012):** Advocates for sustainable and integrated water resource management.
    - Emphasizes demand management, pricing of water, and community participation.
  - **Jal Shakti Abhiyan:** Focused on rainwater harvesting, water conservation, and rejuvenation of water bodies.
    - Targets districts facing acute water scarcity.
  - **Jal Jeevan Mission:** Aims to provide functional household tap connections to all rural households..
  - **Atal Bhujal Yojana:** Focused on groundwater management through community participation and demand-side interventions.
  - **Pradhan Mantri Krishi Sinchai Yojana (PMKSY):** Promotes efficient use of water in agriculture with the slogan "Per Drop More Crop."

What are the Major Issues Related to Water Management in India?

- **Over-Extraction of Groundwater:** India's groundwater resources are being **over-exploited due to unregulated extraction**, primarily for irrigation and domestic needs.

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- This **over-reliance is exacerbated by free electricity for farmers** and insufficient surface water harvesting systems, leading to a severe decline in aquifers.
- **Groundwater levels in 70% of monitored wells have shown significant depletion,** with Punjab declining at an **alarming rate of 0.49 meters annually.**
- Given that groundwater supports **62% of irrigation and 85% of rural drinking water**, its depletion poses a catastrophic threat to water security.

➢ **Inefficient Use of Water in Agriculture:** With agriculture consuming nearly **80% of India's water**, inefficient irrigation methods like **flood irrigation and the cultivation of water-intensive crops** such as sugarcane and paddy exacerbate the water crisis.
- States like **Maharashtra** and **Punjab**, despite being **drought-prone,** continue to grow these crops without adequate diversification.
- For instance, about **4% of farmed land in Maharashtra is under sugarcane,** but it consumes 71.5% of irrigated water, including wells.

➢ **Urban Water Mismanagement:** Rapid urbanization has outpaced water infrastructure, resulting in **supply-demand mismatches** and increasing reliance on tanker water.
- Poor urban planning has reduced groundwater recharge, while untreated sewage further pollutes urban water bodies.
- Bengaluru faces severe water scarcity amid its worst drought in **30-40 years**, with an IISc study attributing it to a **70% decline in the city's water spread area,** leaving the city heavily dependent on Cauvery water.

➢ **Water Pollution:** India's rivers and lakes are turning into **toxic reservoirs due to industrial effluents, untreated sewage, and agricultural runoff.** Weak enforcement of pollution control laws aggravates the problem.
- Despite extensive cleaning efforts, the **Ganga river's faecal coliform level** is found **3 to 12 times higher than the permissible level** at most inter-state boundaries.
- The **CPCB identified 351 polluted river stretches,** with the Yamuna being one of the worst affected, receiving over 80% of Delhi's untreated sewage.

➢ **Climate Change and Variability:** Climate change is intensifying **water-related disasters** such as floods and droughts, destabilizing water availability.
- Erratic monsoon patterns and increased glacial melt in the Himalayas aggravate seasonal water scarcity.
- India's drought-prone area has increased by **57% since 1997**, while instances of heavy rainfall have risen by almost **85% since 2012**
- Studies by ISRO show that approximately **75% of the Himalayan glaciers** are retreating at an alarming rate.

➢ **Inter-State Water Disputes:** Conflicts over river water allocation disrupt cooperative water management and escalate regional tensions.
- These disputes often arise due to a lack of transparent data-sharing and effective institutional mechanisms.
- The **Cauvery water dispute between Karnataka and Tamil Nadu** escalated in 2023.

➢ **Inadequate Focus on Wastewater Recycling:** India's wastewater recycling efforts are inadequate, leading to the wastage of a valuable resource that could be reused for agriculture or industry.
- **Israel**, for instance, reuses **90% of its wastewater** compared to less than **30% in India**.
- While urban India generates **72,368 million litres (MLD)** of sewage every day, **only 28% is treated and reused.**

➢ **Ineffective Water Governance:** Fragmented institutional frameworks and overlapping jurisdictions hinder coordinated water management.
- Policies often prioritize **short-term electoral gains**, **Minimum Support Price** incentives for water-intensive crops like rice and sugarcane, coupled with free or subsidized electricity, amplify water scarcity challenges.
- India ranked **120th in the Water Quality Index** due to poor governance and inadequate implementation of water policies.

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- **Overdependence on Monsoons:** India's reliance on monsoonal rains for agriculture and drinking water supply makes it **vulnerable to erratic rainfall patterns**, which are worsening due to climate change.
  - Poor rainwater harvesting infrastructure further compounds this dependency.
  - About **61% of India's farmers** rely on rain-fed agriculture and **55% of the gross cropped area is under rain-fed farming**
- **Privatization and Commercialization of Water:** The growing privatization of water resources has created inequitable access, with poorer communities often priced out.
  - In many remote areas, private water tankers dominate the supply, charging exorbitant rates.
  - For instance, the Tanker mafia earns **Rs 8,000-10,000 crore annually from water business** in Mumbai, disproportionately affecting people.
- **Loss of Wetlands and Their Water Retention Capacity:** India's wetlands, essential for groundwater recharge and flood mitigation, are shrinking due to urbanization, agriculture, and industrial activities.
  - Nearly two of every five wetlands in India have lost their natural existence in the last 30 years while 40%of water bodies have lost quality for survival of aquatic animals.
  - For instance, Loktak Lake in Manipur, a Ramsar site, is in danger of decline.
- **Impact of Sand Mining on Water Ecosystems:** Illegal sand mining from river beds **disrupts natural water flows, depletes aquifers, and destroys habitats**, worsening water scarcity and ecological imbalances.
  - **India extracts 500 million tons of sand annually**. Excessive sand mining has reduced the **water retention capacity like in Yamuna River**, causing a decline in flow during non-monsoon months

What Measures can be Adopted for Enhanced Water Management?

- **Enforcing Groundwater Regulation:** India must strengthen regulations on groundwater extraction, **particularly in overexploited regions,** and promote the adoption of groundwater recharge systems.
  - Effective implementation can be driven through **community-led initiatives and mandatory water audits** for industries and agriculture.
- **Reviving Traditional Water Harvesting Systems:** Rehabilitating traditional water systems, such as **stepwells, tanks, and johads**, ensures sustainable water availability, particularly in arid and semi-arid regions.
  - **Rajasthan's Tarun Bharat Sangh NGO rejuvenated and revived 11 rivers in the state of Rajasthan**, improving groundwater recharge, which can serve as a model.
- **Promoting Drip and Micro-Irrigation:** Transitioning to **drip and sprinkler irrigation systems** can enhance water use efficiency in agriculture by up to 70%, minimizing waste and conserving water.
  - **Maharashtra's mandate for drip irrigation in sugarcane cultivation** can serve as a model.
- **Strengthening Urban Water Infrastructure:** Modernizing **urban water pipelines, leak detection systems, and smart metering** can significantly reduce non-revenue water (NRW) losses.
  - Mandating **rainwater harvesting** and wastewater recycling for urban projects can augment water resources.
  - For instance, cities like **Bengaluru,** where a major chunk of its water supply is lost to NRW, can benefit from **Singapore's smart water management model.**
- **Enhancing Water Governance:** India requires a **unified water governance framework** that integrates central and state policies to ensure accountability and minimize bureaucratic delays.
  - The **NITI Aayog's Composite Water Management Index (CWMI)** offers a roadmap for performance-based incentives.
  - Transforming cities into **Sponge Cities** is a key goal of the **AMRUT mission** and must be executed sincerely, not left as a **paper tiger**.
  - **National Water Policy (2012)** has not achieved its goals, because of governance and funding issues. Decentralized water management with adequate funding is key.

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- **Incentivizing Crop Diversification:** Encouraging farmers to **shift from water-intensive crops like paddy and sugarcane to millets, pulses, and oilseeds** can reduce water demand in agriculture and improve productivity.
  - Financial incentives and robust market linkages are vital for this shift.
  - **Haryana's Mera Pani Meri Virasat scheme promotes alternative crops**, can serve as a model.
  - India's leadership in promoting millets during the **International Year of Millets (2023)** highlighted the potential of these water-efficient crops.
- **Advancing Wastewater Treatment and Reuse:** Investing in **wastewater treatment** infrastructure can convert urban sewage into usable water for agriculture, industry, and landscaping, building upon **Supreme Court's M.C. Mehta v. Union of India judgement.**
  - Chennai reuses **20% of its treated wastewater for industrial applications and can serve as a model.**
- **Addressing Climate Change Impacts:** Building climate-resilient infrastructure such as **floodplains, embankments, and storage reservoirs** can mitigate extreme weather impacts like floods and droughts.
  - Afforestation in catchment areas stabilizes water cycles. **Assam's Climate Resilient Brahmaputra Integrated Flood and Riverbank Erosion Risk Management Project,** can serve as a model.
- **Expanding Digital Water Management:** Digital technologies like **IoT sensors, satellite imagery, and AI** can optimize water monitoring, improve irrigation efficiency, and reduce leaks. Real-time decision-making through these tools enhances transparency and accountability.
  - **Mekorot, Israel's national water company, is installing AI-driven water quality monitoring**, setting a benchmark.
- **Protecting and Restoring Wetlands:** Wetlands act as natural water purifiers and storage systems but are rapidly declining due to urbanization and encroachments.
  - **Restoring degraded wetlands** can improve water quality and recharge aquifers, building upon Supreme Court judgment in ***Mirza Abid Beg vs State Of U.P,*** where SC observed that the **State has the constitutional duty to not only protect water bodies within the state but also to restore those water bodies**
  - **East Kolkata Wetlands**, on a daily basis, **naturally recycle 910 million litres of the city's** untreated sewage by providing a **basin for aerobic treatment of wastewater**
- **Incentivizing Private Sector Participation:** Private-sector investment in water infrastructure, such as **desalination plants, wastewater treatment, and smart water management,** can complement public efforts.
  - Clear regulations and public-private partnerships (PPP) are key to success.
  - **The Narmada desalination plant in Gujarat,** developed under a PPP model, can serve as a model.
- **Developing Inter-State Water Sharing Frameworks:** India must establish robust legal and institutional mechanisms to **manage inter-state water disputes and ensure equitable distribution of shared resources.**
  - Mediation, data transparency, and cooperative agreements are essential.
  - The **Cauvery Water Management Authority (CWMA)** has shown mixed results, but a transparent data-sharing mechanism could improve its effectiveness.
  - The **Indus Water Treaty model** can inspire similar frameworks for inter-state rivers like the Krishna and Godavari.
- **Introducing Differential Water Pricing:** Tiered water pricing for **agricultural, industrial, and domestic consumers** can discourage wasteful practices while subsidizing access for vulnerable populations.
  - China's water pricing reforms show that the policy reform reduced annual residential water demand by **3–4% in the short run and 5% in the longer run.**

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Conclusion:

India's water crisis demands an **urgent, multi-pronged approach that transcends traditional management strategies**. By integrating **innovative technologies, policy reforms, and community-driven solutions,** the country can address its critical water challenges. Embracing sustainable practices like micro-irrigation, wastewater recycling, and traditional water harvesting techniques will be pivotal in securing water resources.

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Scaling Up the Startup Ecosystem

This editorial is based on "UAE galvanising start-ups" which was published in The Hindu Business Line on 05/12/2024. The article brings into picture the emergence of India's startup ecosystem as a global leader, with over 140,000 startups and 111 unicorns, supported by the UAE's $20 billion investment. However, it highlights the need to address challenges in funding, regulation, and innovation to sustain growth.

Tag: GS Paper - 3, Employment, Growth & Development, IT & Computers, Mobilization of Resources

India's startup ecosystem has emerged as a global powerhouse, with over **140,000 recognized startups and 111 unicorns** driving technological innovation across diverse sectors. The UAE has become a critical strategic partner, with significant investments exceeding **$20 billion** and providing crucial support for Indian entrepreneurs seeking international expansion. More than **30% of Dubai's startups are founded by Indians**, demonstrating the deep entrepreneurial synergy between the two nations. However, India needs to work more to enhance its startup culture, addressing challenges in **funding, regulatory frameworks, and sustained innovation to maintain its competitive edge.**

What are the Current Growth Drivers of India's Startup Ecosystem?

- **Government Initiatives and Policy Support:** The Indian government has implemented policies like Startup India, Standup India, **offering tax exemptions,** funding, and support for incubators, which have significantly boosted entrepreneurial activity.
  - As of June 2023, **over 100,000 startups have been recognized under this initiative,** reflecting its widespread impact.
- **Expanding Digital Infrastructure:** The **proliferation of smartphones and affordable internet** has expanded digital access, enabling startups to reach a broader customer base.
  - India is now the **second-biggest manufacturing hub for mobile phones** due to heavy investment from original equipment manufacturers and original design
  - Also, India has more than **820 million active internet users at present,** facilitating the growth of digital businesses.
- **Growing Investment Ecosystem:** A surge in venture capital and private equity investments has provided startups with essential funding.
  - Between 2014 and H1 2024, the Indian startup ecosystem attracted over $150 billion in investments, with **ecommerce, fintech, and enterprise tech leading the charge, contributing to 52% of the total funding**
  - Programs like **Google's Launchpad and Microsoft for Startups** offer funding, mentorship, and market access.
- **Evolving Consumer Market:** A growing middle class with increasing disposable income has created a robust domestic market for new products and services.
  - India's fast-moving consumer goods **(FMCG)** sector grew **5.7% by value and 4.1% by volume** in the **July-September 2024** driven by rural demand.
  - Projections indicate that India's affluent segment will reach **100 million by 2027, offering substantial opportunities for startups.**
- **Supportive Regulatory Environment:** Recent regulatory reforms have streamlined business operations. The **Reserve Bank of India (RBI)** has streamlined the compliance process for foreign

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companies undergoing a **"reverse flip" merger** with their Indian subsidiaries, cutting the timeline **from 12-18 months to just 3-4 months.**

- This move boosts efficiency and encourages startups to list in India.

- **Thriving Incubation and Acceleration Programs:** Institutions like **IIM Bangalore's NSRCEL provide mentorship**, funding, and resources, nurturing early-stage startups and fostering innovation.
  - Programs such as the **Women Entrepreneurship Program** have been instrumental in supporting dive
- **Rise of Deep-Tech and AI Startups:** The demand for cutting-edge technologies like **Artificial Intelligence, Machine Learning, and IoT** is fueling the growth of deep-tech startups.
  - India has emerged as a **top contender in Artificial Intelligence (AI) readiness,** ranking among the **top 10 globally,** as per the Boston Consulting Group's (BCG) report.
  - According to Nasscom, India's deeptech sector is buzzing with over 3,000 startups and a **53% growth rate over the past decade.**
- **Expansion of D2C (Direct-to-Consumer) Models:** The **direct-to-consumer model** has gained traction, with startups bypassing intermediaries to connect with consumers digitally.
  - The **Indian D2C market is expected to reach $100 billion by 2025**. The increasing adoption of e-commerce platforms and personalized marketing tools is propelling this trend.
- **Rise of Tier-2 and Tier-3 City Entrepreneurship:** Entrepreneurship is **no longer confined to metropolitan cities;** smaller cities are emerging as startup hubs.
  - Initiatives like the **Atal Innovation Mission** are enabling entrepreneurs in Tier-2 and Tier-3 cities through incubators and funding.
  - **Over 50% of startups recognized by the DPIIT in 2023** originated from non-metro regions, showcasing this decentralized growth.
- **Digital Payments Revolution and FinTech Boom:** The adoption of **UPI and the growth of digital payments** have transformed the fintech landscape, creating opportunities for startups.
  - Over 1**1 Billion UPI transactions** were done in October 2023 alone, fostering startups like PhonePe and Razorpay to scale rapidly.
  - The I**ndian fintech market** touted as the fintech hub globally is estimated to reach assets under management (AUM) of **$1 trillion by 2030,** up 10-fold from its 2021 size of roughly $100 billion.
- **Fostering Sustainability and Green Startups:** Sustainability-focused startups are gaining traction, fueled by government commitments like **India's Net Zero 2070 target.**
  - Startups like **ElectricPe and Zypp Electric** are leveraging EV and clean energy markets. The **UNDP Accelerator Labs in India** have further nurtured green innovation.
- **Emergence of Corporate Venture Capital (CVC):** Large corporations are investing in startups via **Corporate Venture Capital,** offering not just funding but also market expertise.
  - Companies like **Reliance, Tata, and Infosys have active CVC arms.** This integration provides startups with the resources to scale and innovate.
- **Cultural Shift Toward Entrepreneurship:** A growing cultural shift in India views **startups as aspirational career choices**, with risk-taking becoming more socially acceptable.
  - Media programs like **Shark Tank India and startup success stories** have popularized entrepreneurship.
  - Surveys reveal that **77% of Indian youth** expressed an interest in starting their own ventures.

What are the Key Issues Related to India's Startup Ecosystem?

- **Tightening Liquidity and Funding Challenges:** India's startup ecosystem faces a stark reduction in **funding,** highlighting a shift toward **cautious investment practices globally.**
  - The reduced risk appetite among investors is prioritizing profitability over growth, constraining startups dependent on external capital for scaling.

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- Indian startups have reported around **73% decline** in funding **in 2023 as compared to 2022** startups are grappling with stagnation amid rising operational costs.

- **Policy Volatility and Taxation Woes:** Frequent changes in taxation policies and regulatory ambiguity undermine investor confidence and operational ease for startups.
  - The **imposition of the Angel Tax on foreign investors in 2023**, while aiming to curb money laundering, deterred legitimate foreign investments in early-stage startups.
  - Despite initiatives like **Startup India,** the majority of Indian startups still spend a major chunk of their resources on navigating compliance, **limiting their focus on innovation.**
- **Talent Retention and Skill Mismatch:** While India produces a large volume of skilled **graduates annually**, startups face difficulties in retaining top talent due to global opportunities and domestic salary disparities.
  - The allure of stable jobs abroad or in established MNCs has worsened the "**brain drain**" in critical areas like AI and machine learning.
  - Between 2015 and 2022,1**.3 million Indians left the country,** many of whom were highly educated professionals creating a **talent vacuum for Indian startups aiming to innovate.**
- **Overdependence on Urban Markets:** Startups largely focus on **urban-centric business models,** neglecting the vast potential in rural India.
  - This overdependence restricts their scalability and misses out on a market comprising over **65% of India's population** and startups still struggle to penetrate rural areas due to logistical and infrastructural challenges.
- **Market Saturation and Fragmentation in Key Sectors:** Certain industries, such as **edtech and fintech**, are reaching saturation points, leading to intense competition and declining margins.
  - The fall of major players, showcases how overexpansion and unregulated competition have destabilized these sectors.
  - Such saturation has resulted in **layoffs and funding crunches**, creating a ripple effect across the ecosystem.
- **Insufficient Collaboration Between Academia and Startups:** India's academic institutions remain underutilized as engines of innovation for startups.
  - Unlike **Silicon Valley,** where academia drives commercialization, Indian startups rarely collaborate with research institutions for cutting-edge technologies.
  - A 2019 report suggests that out of **500 odd industrial clusters across India, 30-35% do not have any research institute or university** in their vicinity.
- **Digital Divide and Infrastructure Gaps:** Despite the **proliferation of digital tools,** startups are hindered by inconsistent infrastructure, particularly in rural areas.
  - The absence of **high-speed internet in rural regions** limits access to untapped markets, slowing the growth of sectors like agritech.
  - A 2022 report revealed that almost **60% of the rural population is still not actively using the internet,** startups struggle to deliver scalable, tech-driven solutions to underserved populations.
- **Lack of Focus on Sustainability and ESG Alignment:** Startups are increasingly scrutinized for failing to align with **Environmental, Social, and Governance (ESG)** standards, leading to reputational risks and regulatory challenges.
  - Food delivery platforms like **Swiggy and Zomato faced backlash for over-reliance on plastics**.
  - As India pushes for a circular economy and net-zero commitments, startups failing to adopt sustainable practices risk losing market trust and funding.
- **Rising Protectionism and Global Competition:** India's startups are increasingly facing challenges from **global rivals in sectors like fintech, gaming, and e-commerce,** where international players dominate.
  - At the same time, local protectionist policies, such as **mandatory data localization**, create compliance hurdles for startups aiming for global scalability.
  - For instance, while Indian startups have struggled with compliance costs, global competitors like **Amazon have continued aggressive market expansion in India.**

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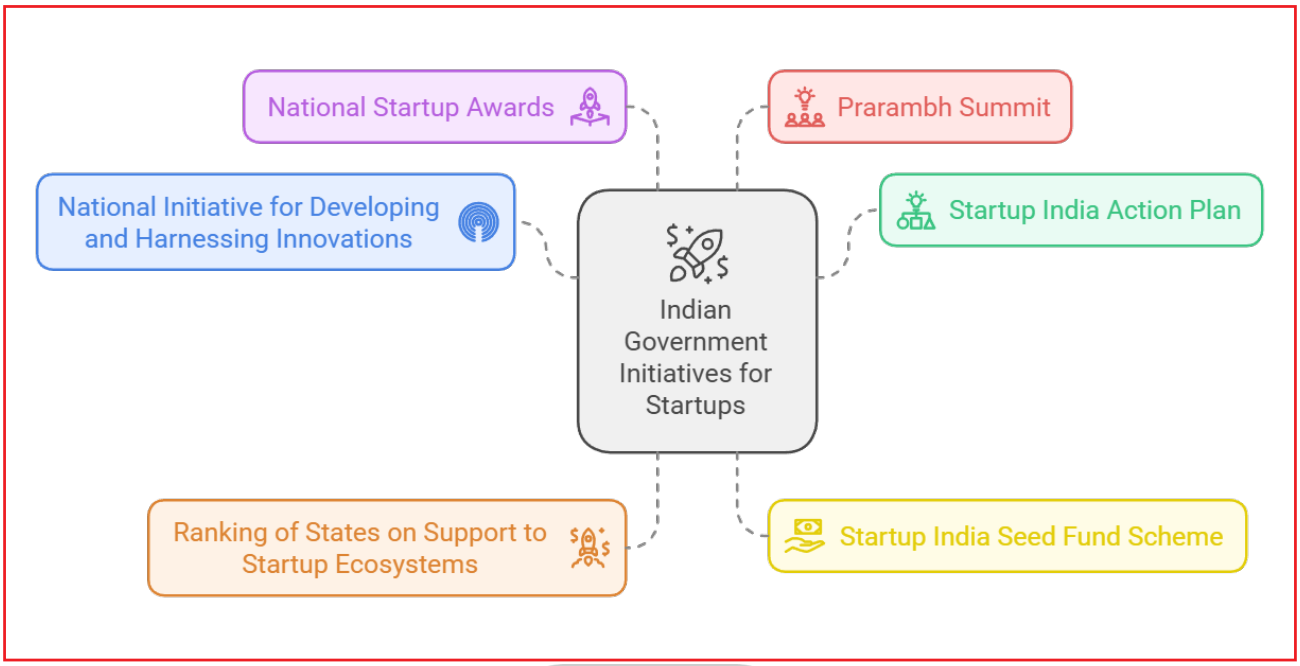

What Steps can be Taken to Strengthen India's Startup Ecosystem?

- **Streamlining Regulatory and Compliance Processes:** Simplifying **startup registration, taxation, and compliance procedures** is crucial to reduce bureaucratic inefficiencies.
  - A unified, time-bound single-window clearance system can address delays and ambiguities.
  - For example, expanding the scope of the **Ease of Doing Business Reforms 2.0,** combined with **reducing compliance costs under DPIIT's Startup India initiative,** can save startups hundreds of operational hours annually and promote faster scaling.
- **Expanding Access to Funding Mechanisms:** India should promote sector-specific venture funds and broaden the scope of the **Fund of Funds for Startups (FFS) program.**
  - Introducing innovative funding models like **revenue-based financing for early-stage startups c**an reduce the burden of equity dilution.
  - Scaling up the **SIDBI Startup Fund** and linking it to emerging sectors like **green energy and deep-tech** can bridge funding gaps effectively.
- **Enhancing Collaboration Between Academia and Startups:** Structured industry-academia collaboration can drive innovation, particularly in deep-tech and biotech startups.
  - Setting up innovation zones in universities under the **National Research Foundation (NRF)** can provide startups with access to cutting-edge research and technical expertise.
  - These zones should **focus on converting research into commercially viable technologies**, creating intellectual property hubs.
- **Strengthening Rural Digital Infrastructure:** Expanding the **BharatNet program** to ensure **100% rural broadband coverage** is key to unlocking the rural startup ecosystem.
  - Startups in **agritech, edtech, and e-commerce** can thrive with enhanced internet penetration.
  - Partnering with private players for last-mile connectivity under **public-private partnership (PPP) models** can ensure faster execution and reduce costs, fostering rural inclusivity.

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- **Promoting Sustainability-Centric Startups:** Incentivizing green startups through tax benefits and subsidies can align the ecosystem with India's climate goals.
  - Linking sustainability initiatives like the **National Green Hydrogen Mission** and renewable energy subsidies to startups in **EVs, clean tech, and waste management** can accelerate innovation in this sector.
  - For example, **grants for battery recycling startups** can align environmental goals with startup development.
- **Improving Access to Global Markets:** Encouraging startups to expand globally through government-supported export schemes can increase their market size.
  - Programs like **MADE (Mentoring, Access, Development, and Export)** should be initiated to include funding for participation in international expos and trade missions.
  - Partnering with **chambers of commerce globally** can also help Indian startups build cross-border networks.
- **Tackling High Customer Acquisition Costs (CAC):** To reduce CAC, the government can promote digital public infrastructure like **ONDC (Open Network for Digital Commerce)** to create a level playing field.
  - ONDC can enable smaller startups to leverage shared resources and reduce dependence on heavy marketing spends.
  - Additionally, **incentives for startups leveraging data analytics** for customer retention can lower churn rates, improving profitability.
- **Fostering Women-Led Startups:** Targeted initiatives to encourage women entrepreneurs, such as **preferential credit under the Stand-Up India scheme,** can address gender disparities.
  - Expanding mentorship networks specifically for women founders and providing subsidized coworking spaces can create a more inclusive startup environment.
- **Leveraging Digital Public Goods (DPGs):** Startups can use India's robust digital infrastructure, such as **DigiLocker,** to develop scalable solutions.
  - Promoting **open-source APIs for startups** to build on top of these platforms can drive innovation.
  - For example, fintech startups can utilize **Account Aggregator Frameworks** to create personalized financial products, reducing the time to market and enhancing efficiency.
- **Building Robust Mentorship Networks:** Creating national and regional mentorship networks can address the knowledge gap among founders.
  - Programs like **SAMRIDH (Startup Accelerator of MeitY for Product Innovation, Development, and Growth)** can be expanded to provide sector-specific mentorship.
  - Pairing successful entrepreneurs with early-stage startups through **structured government-led programs** can fast-track their learning curve.
- **Reforming Labor Laws to Support Gig Economy Startups:** Labor reforms to accommodate gig and platform workers can enhance the ecosystem's sustainability.
  - **Creating social security frameworks and health benefits for gig workers** under programs like Code on Social Security, 2020 can reduce workforce volatility.
  - This would particularly benefit startups in sectors like **food delivery, ride-hailing, and logistics.**
- **Promoting Cross-Border Collaborations in Emerging Sectors:** Fostering international collaborations in areas like **AI, blockchain, and clean energy** can position Indian startups at the forefront of global innovation.
  - Bilateral agreements with countries like the **US and Japan**, focused on startup exchange programs, **can enable knowledge transfer.**
  - Integrating these with Startup India International Summits can enhance India's global startup footprint.

Conclusion:

India's startup ecosystem has demonstrated remarkable growth and global potential, driven by government policies, expanding digital infrastructure, and an evolving investment landscape. However, challenges like **funding shortages, policy volatility, and talent retention remain** significant obstacles. To strengthen this ecosystem, India must streamline **regulatory processes, improve rural digital infrastructure and foster academia-startup collaboration**

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Tackling Soil Degradation in India

This editorial is based on "Nourishing our soil" which was published in The Financial Express on 09/12/2024. The article brings into focus the critical challenge of India's agricultural sustainability, highlighting deteriorating soil health with less than 5% of soils having adequate nitrogen and only 20% containing sufficient organic carbon. The current fertilizer subsidy system, focused on urea, causes nutrient imbalances, reducing productivity and contributing to environmental degradation, necessitating urgent reforms.

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

India's agricultural sustainability faces a critical challenge with soil health deterioration. Recent assessments reveal that less than **5% of Indian soils have high nitrogen levels, while only 20% contain sufficient organic carbon.** The current fertilizer subsidy system, predominantly focused on **urea**, has led to **imbalanced nutrient usage**, with excessive nitrogen and insufficient phosphorus and potassium application. This nutrient imbalance not only reduces agricultural productivity but also contributes to environmental degradation. **Urgent systemic reforms** are needed to address these challenges and ensure long-term soil health and agricultural sustainability.

What is the Current Status of Soil Degradation in India?

- **Current Status**:The **Desertification and Land Degradation Atlas of India (SAC 2021)** indicates the current extent of land degradation to be **97.85 million hectares** covering **29.77% of the geographical area** of the country during 2018-19.
- **Geographic Spread and Severity**: Semi-arid and dry sub-humid regions are the most impacted, with states like **Rajasthan, Maharashtra, Gujarat, and Telangana** showing significant degradation.
  - Rajasthan alone has over **21 million hectares classified as degraded**, primarily due to wind erosion in its arid zones.
  - **Desertification processes have increased**, with **83.69 million hectares** now classified as drylands undergoing desertification, a net rise of over 1 million hectares since 2003-05.

What are the Key Issues Leading to Soil Degradation in India?

- **Unsustainable Agricultural Practices:** India's reliance on intensive farming techniques, including **overuse of chemical fertilizers, pesticides, and monocropping**, has resulted in nutrient depletion and soil acidification.
  - For example, Punjab and Haryana face declining organic carbon levels due to the Green Revolution's legacy of high-yield cropping.
  - In India **organochlorine insecticides such as DDT and HCH** constitute more than **70% of the pesticides used at present.**
- **Deforestation and Urbanization:** Rapid deforestation for agriculture, infrastructure, and urban expansion accelerates soil erosion and reduces water retention.
  - Recent data showed that **95% of the tree cover loss in India from 2013 to 2023 occurred within natural forests.**
    - For instance,the Western Ghats, which is among 36 global biodiversity hotspots, saw a loss of **5% evergreen forest cover,** impacting local soil fertility.
- **Overgrazing and Unsustainable Livestock Management: Unregulated grazing** leads to vegetation loss, **exposing topsoil to erosion**, particularly in arid and semi-arid regions like Rajasthan and Gujarat.
  - India has over **535 million livestock** exceeding sustainable carrying capacity. Increase in livestock numbers, has led to **increased pressure on grazing lands** with consequent overgrazing and denuding of plant cover.
- **Water Mismanagement and Irrigation Practices:** Excessive groundwater extraction and poor irrigation techniques, **such as flood irrigation,** result in soil salinization and waterlogging.
  - Over-irrigation has led to severe salinity. Around **6.74 million ha area in the country is salt-affected**.
    - In Punjab, **around 50% of land is degraded due to salinization** caused by over-irrigation, leading to waterlogging and salt accumulation on the surface.
  - Estimates suggest that every year nearly **10% additional area is getting salinized,** and by 2050, around **50% of the arable land would be salt-affected.**

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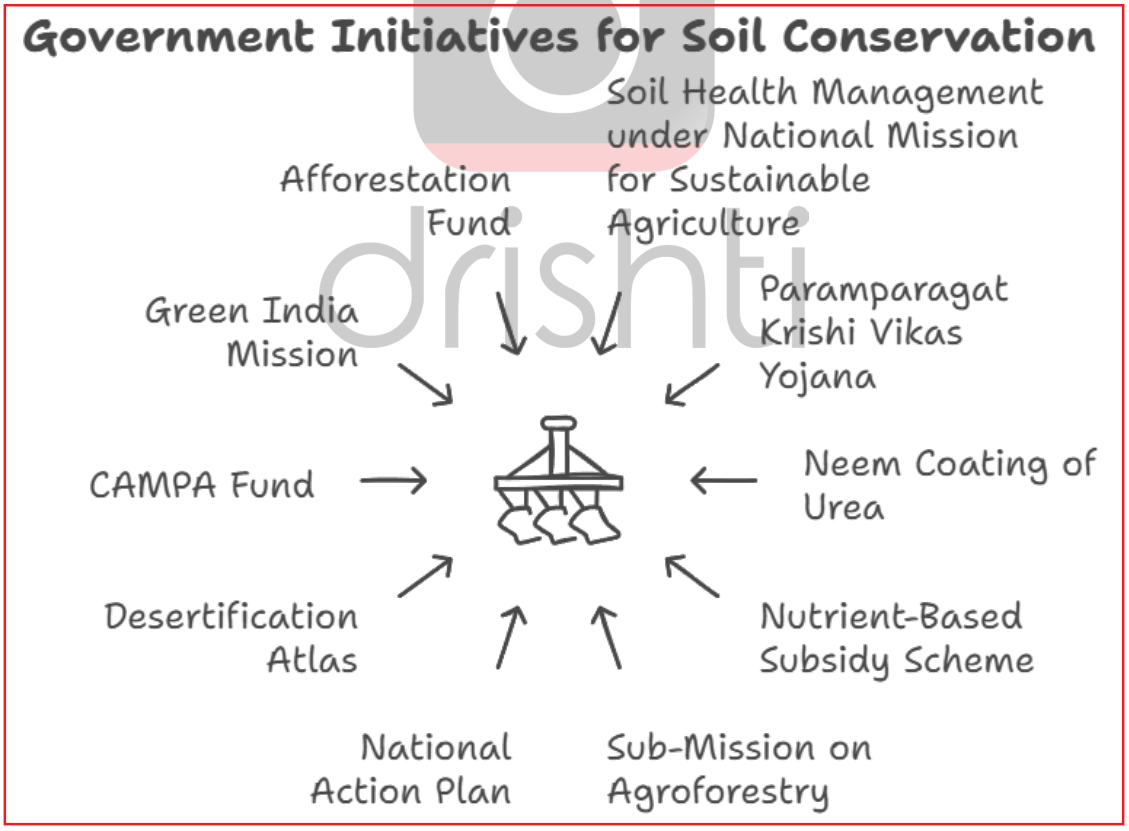
- **Industrial Pollution and Mining Activities:** Industries discharge **heavy metals, chemicals, and pollutants** into nearby soil ecosystems, particularly in mining-intensive states like Odisha and Jharkhand.
  - Toxic contamination from **coal mining and fly ash dumps** has rendered large swathes of land unproductive.
  - For instance, the **Sterlite Copper plant in Tamil Nadu has caused severe soil and water contamination** due to the discharge of toxic chemicals into the air and nearby water bodies.
- **Climate Change and Extreme Weather Events:** Climate change-induced phenomena, such as **erratic rainfall, droughts, and floods**, exacerbate soil erosion and nutrient depletion.
  - For example, the **2023 Himachal Pradesh floods caused severe topsoil loss in agricultural zones**.
  - Areas susceptible to high or very high soil erosion rates are likely to increase from **35.3% to 40.3%** toward the end of the century, due to climate change.
- **Shifting Cultivation and Slash-and-Burn Practices:** In northeastern states like **Nagaland and Manipur,** shifting cultivation continues to degrade soil fertility due to slash-and-burn cycles that destroy organic matter.
  - A total of 4925 km² in North East India has been identified as **jhuming hotspots,** of which over **62% falls in Arunachal Pradesh, Assam, and Mizoram,** which leads to extensive soil erosion and biodiversity loss.
- **Unregulated Construction and Infrastructure Projects:** Large-scale construction for **roads, dams, and urban settlements** strips topsoil and disrupts natural drainage patterns.
  - For example, the construction of the **Char Dham Highway in Uttarakhand** has led to soil instability and landslides, with over **300 instances recorded along one section of the highway.**
- **Invasive Species:** Proliferation of **invasive plant species** like ***Lantana camara*** reduces soil fertility by depleting nutrients and disturbing native biodiversity.
  - Recent studies show high concern invasive plants were recorded in **22% natural areas** and predicted to potentially threaten **66% of natural areas.**



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Why Indian Government Initiatives Related to Soil Conservation Remain Partially Effective?

- **Fragmented Policy Framework**: India's soil management policies are **scattered across multiple ministries and schemes**, leading to a lack of coordination and focus.
  - For instance, the **Soil Health Card Scheme** operates independently of programs like **Pradhan Mantri Krishi Sinchayee Yojana (irrigation) and MNREGA (land restoration).**
  - This siloed approach **prevents holistic soil management.**
- **Inadequate Implementation and Monitoring:** While schemes like the **Soil Health Card and Paramparagat Krishi Vikas Yojana (PKVY)** aim to improve soil health, their on-ground implementation faces significant hurdles.
  - A 2022 data states that **only 33% of farmers use soil health recommendations**. A lack of accountability and real-time feedback further dilutes the impact.
- **Neglect of Regional Specificity:** Most soil health initiatives are generic and fail to address region-specific challenges like **desertification in Rajasthan or salinity in Gujarat.**
  - This one-size-fits-all approach undermines the effectiveness of soil management programs.
- **Weak Linkages Between Research and Implementation:** India's soil research outputs from institutions like ICAR and IITs are not effectively translated into field-level solutions.
  - For example**, innovations like biochar and microbial fertilizers remain** underutilized due to lack of government support for commercialization. This disconnect reduces the impact of R&D on soil health improvement.

What Measures can be Adopted for Effective Soil Health Management in India?

- **Promoting Sustainable Farming Practices:** Encouraging **organic farming, crop rotation, and agroforestry** can restore soil health by increasing organic matter and microbial activity.
  - The **Paramparagat Krishi Vikas Yojana** supports organic farming, but its reach needs expansion with greater farmer training.
  - **Linking PKVY with the Soil Health Card Scheme for real-time soil monitoring** can ensure region-specific recommendations.
- **Promoting Wadi System**: A traditional tree-based farming approach in India, the Wadi system integrates **agriculture, horticulture, and forestry**.
  - It promotes agroforestry as a sustainable practice**, enhancing soil health by preventing erosion,** conserving water, and enriching biodiversity.
  - This approach also supports socio-economic empowerment and sustainable agriculture, making it a valuable measure for effective soil health management.
- **Improving Water Management Techniques:** Adopting micro-irrigation methods like drip and sprinkler systems **reduces waterlogging and salinization while conserving water.**
  - For instance, PM Krishi Sinchayee Yojana (PMKSY) aims to expand irrigation but **can be integrated with precision agriculture to optimize water-soil balance.**
    - Currently there is only **19% micro-irrigation coverage, indicating a vast scope for scaling up.**
- **Enforcing Regulations Against Sand Mining:** Strict monitoring and sustainable sand mining policies can prevent excessive riverbank erosion and protect soil ecosystems.
  - Using technologies like **drones and AI to monitor riverbeds**, as seen in the **Andhra Pradesh sand mining regulation model,** can ensure compliance.
- **Rehabilitating Degraded Lands:** Land reclamation through **afforestation, grassland restoration (like Banni Grassland Restoration), and wetland revival** can significantly reduce soil erosion, in line with India's commitment to achieve **land degradation neutrality by 2030** under the **United Nations Convention to Combat Desertification (UNCCD).**
  - Programs like the **National Afforestation Programme(NAP)** should integrate community-led initiatives for better outreach.

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- Integrating **NAP with MGNREGA** to provide employment opportunities in land restoration could serve **dual objectives of ecological recovery and rural development.**

➢ **Promoting Conservation Agriculture:** Conservation agriculture practices like **zero tillage, mulching, and cover cropping** enhance soil structure and organic carbon.

- For example, the **Borlaug Institute for South Asia (BISA),** based in Ludhiana, Punjab, actively promotes **zero-tillage farming practices, particularly through the use of a "Happy Seeder" technology,**
- Expanding these methods to other high-yield zones under PMKSY would ensure broader impact.

➢ **Adopting Bioremediation for Contaminated Soils:** Bioremediation using **microbes and plants can clean up soils polluted** by heavy metals and industrial effluents.

- This technique has been successfully piloted in **Gujarat's Ankleshwar industrial region to restore farmland**.
- An example of adopting bioremediation for contaminated soils is the **use of fish oil added to spent mushroom compost,** which was mixed with **creosote-contaminated soil.**
  - This combination resulted in the most effective **degradation of polycyclic aromatic hydrocarbons (PAHs).**

➢ **Expanding Soil Health Card Utility:** The Soil Health Card (SHC) Scheme should move beyond distribution and **focus on farmer education for implementing its recommendations.**

- Linking SHC data with digital platforms like **Kisan Suvidha app** can provide **real-time advisory services.**
- Integrating this with **local Krishi Vigyan Kendras (KVKs)** could ensure grassroots-level support for farmers.

➢ **Creating Coastal Soil Management Plans:** Comprehensive soil management plans for coastal regions can mitigate salinity intrusion through mangrove afforestation and saline-resistant crops.

- Projects like the **National Coastal Mission under the National Action Plan on Climate Change (NAPCC**) should focus more on soil health along with habitat protection.
- **Tamil Nadu's mangrove restoration model** can be replicated for broader impacts.

➢ **Investing in Research and Development:** Encouraging R&D for developing soil-friendly technologies such as **bio-fertilizers and efficient soil testing** kits can revolutionize soil management.

- Institutes like ICAR should **collaborate with startups to innovate affordable solutions.** For example, **integrating biochar production with agricultural waste management** could reduce waste while enriching soil.

➢ **Promoting Urban Composting and Circular Economy:** Encouraging municipal composting facilities can convert **urban organic waste into high-quality manure**, reducing dependency on chemical fertilizers.

- **Karnataka Compost Development Corporation, which processes 250 tons of wet waste daily,** is a replicable model.
- Incentivizing such projects through GST rebates on compost sales could further boost adoption.

➢ **Strengthening Natural Farming Initiatives:** Natural farming techniques like the **Subhash Palekar Natural Farming (SPNF) model** reduce dependency on external inputs while enhancing soil biodiversity.

- Linking SPNF with local **Krishi Vigyan Kendras (KVKs)** can ensure farmer adoption and better outreach.

➢ **Promoting Integrated Nutrient Management:** Balanced use of chemical fertilizers along with **organic and bio-fertilizers can address nutrient imbalances.**

- Revising the **Nutrient Based Subsidy (NBS)** to **include bio-fertilizers** and promoting fortified fertilizers can ensure better soil health.
- Linking NBS reforms with soil health card data can ensure farmer-specific recommendations.

➢ **Developing Digital Soil Health Mapping:** A **national digital database for soil health mapping** can help monitor degradation trends and recommend location-specific measures.

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- Leveraging **ISRO's Earth Observation Satellites** for periodic soil mapping would provide actionable insights.
- Integrating such data into agricultural policies can enable precision soil management practices.

➢ **Tackling Microplastic Contamination:** Strict **bans on single-use plastics must extend to better management of agricultural plastics.**
- Promoting biodegradable alternatives and recycling systems can reduce microplastic soil contamination.
- **Incentives for industries developing biodegradable agri-plastics** could support this shift.

➢ **Strengthening Community Participation:** Empowering **local self-help groups and Panchayati Raj institutions** in soil conservation ensures better outreach and implementation.
- For instance, **Gujarat's participatory watershed program can be a model**.
- Expanding such community-led models nationwide could enhance ownership and success rates.

➢ **Integrating Climate Adaptation with Soil Conservation:** Combining climate adaptation strategies like **afforestation with soil health programs** can build resilience against climate-induced degradation.
- For example, integrating **National Adaptation Fund for Climate Change (NAFCC)** projects with **watershed development schemes can create synergies.**
  - States like Rajasthan could benefit from such dual-purpose initiatives.

Conclusion:

Addressing **soil degradation through integrated, sustainable farming practices, effective water management, and targeted conservation** efforts is crucial for India's agricultural future. Soil health is vital for India's agricultural economy (e.g., dependency on agriculture for 57% of livelihoods and in achieving **SDG 15 (Life on Land)**, ensuring long-term agricultural productivity, food security, and environmental sustainability.

■■■

Minilateralism Transforming Global Diplomacy

This editorial is based on "Grand Strategy | How minilateralism is reshaping global order" which was published in Hindustan Times on 08/12/2024. The article brings into picture the rise of minilateralism, highlighting how it fosters targeted partnerships to address regional challenges, with India playing a pivotal role in advancing multipolarity. While offering agile solutions, minilateralism's limited scope may hinder the resolution of broader global issues.

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

Minilateralism is reshaping the global order by fostering partnerships among countries to address specific regional challenges, **moving away from the slower, often ineffective processes of multilateralism.** India plays a pivotal role in this shift, leveraging minilateral frameworks to advance multipolarity and secure its strategic interests. Driven by a desire for trusted partnerships and secure trade, **minilateralism offers countries an alternative to the uncertainties of global governance.** While they provide agile and focused solutions, their limited scope may hinder the resolution of broader global issues.

What is Minilateralism?

➢ **Minilateralism** refers to the formation of **smaller, more focused coalitions or alliances involving a limited number of countries** to address specific global, regional, or issue-based challenges.
- These coalitions are usually formed **among nations with shared interests, goals, or concerns,** allowing for quicker decision-making and more targeted outcomes.

➢ **Example**: The **Quadrilateral Security Dialogue (Quad) involving the U.S., India, Japan, and Australia** is an example of minilateralism, focused on ensuring a free and open Indo-Pacific.

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How is Minilateralism Different from Multilateralism?

Aspect	Minilateralism	Multilateralism
Number of Participants	Few countries (e.g., 3-10 members).	Broad participation (often global, e.g., UN, WTO).
Focus	Specific issues or regional challenges.	Broad, global challenges requiring universal consensus.
Decision-Making	Faster and more flexible due to fewer members.	Slower due to the need for consensus among many.
Scope of Issues	Narrow, well-defined objectives (e.g., security, trade).	Wide-ranging, addressing global concerns (e.g., climate change).
Inclusivity	Limited to like-minded or strategically aligned nations.	Open to all nations regardless of ideology.
Efficiency	High, as fewer members lead to quicker actions.	Lower, as diverse interests can delay decisions.

Why is the Global Order Shifting towards Minilateralism from Multilateralism?

- **Fragmentation of Global Consensus**: Multilateralism often struggles to achieve consensus due to the diverging interests of diverse member states, leading to inefficiency and inaction.
  - This paralysis is evident in the **WTO's inability to finalize the Doha Development Agenda** after over two decades.
  - As a result, countries are opting for smaller, issue-specific coalitions like the **Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP).**
- **Power Asymmetry and Emerging Geopolitical Rivalries**: The **dominance of major powers in multilateral institutions** sidelines smaller nations, creating dissatisfaction and mistrust.
  - For instance, **China's Belt and Road Initiative (BRI)** is reshaping global finance outside of traditional multilateral frameworks like the **World Bank.**
  - Also, smaller groups such as the **G7 have emerged as counterbalances,** with recent G7 statements addressing China's economic coercion.
- **Efficiency and Speed in Crisis Management**: Minilateral frameworks enable faster responses to crises compared to multilateral setups, which often face bureaucratic delays.
  - During the **Covid-19 pandemic,** multilateral bodies like the **WHO were criticized for delayed responses,** while the Quad countries agreed to provide over **1.2 billion doses of Covid vaccines** globally.
  - This highlights the agility of minilateral arrangements in addressing emergencies.
- **Focused and Tailored Approaches:** Minilateralism allows countries to collaborate on specific, actionable goals without broader constraints.
  - For instance, the **Australia-UK-US (AUKUS)** pact addresses **regional security and technological sharing** in the Indo-Pacific, bypassing the inefficiencies of broader multilateral agreements like the **UN Security Council.**
- **Response to Structural Shifts in Global Power:** The rise of regional powers like China and India has led to the creation of minilateral platforms to address regional interests directly.
  - The **Regional Comprehensive Economic Partnership (RCEP),** excluding the U.S., shows how Asian economies are bypassing traditional multilateral systems dominated by the West.

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- **Crisis of Legitimacy in Multilateral Institutions:** The inability of institutions like the **UN to address critical issues (e.g., the Russia-Ukraine war)** has eroded their credibility.
  - The growing resistance from host nations against **UN peacekeeping missions**, seen in **Sudan's rejection of UNAMID**, **Mali's forced withdrawal of MINUSMA, and the Democratic Republic of Congo's push for MONUSCO's exit,** reflects the loss of credibility.

What Role does India Play in the Rise of Minilateralism?

- **Leadership in Regional Security:** India is positioning itself as a key player in minilateral security frameworks to counterbalance China's assertiveness in the Indo-Pacific.
  - Through the **Quad (India, USA, Japan, and Australia)**, India is working on maritime security, countering illegal fishing, and ensuring freedom of navigation in the region.
  - Simultaneously, **India remains engaged in SAARC (South Asian Association for Regional Cooperation)**, focusing on regional stability, counterterrorism, and economic cooperation
- **Economic Partnerships Through Targeted Agreements:** India has been proactive in minilateral trade and economic agreements to enhance regional supply chains and reduce dependency on China.
  - For instance, under **India-UAE Comprehensive Economic Partnership Agreement,** both countries agreed to **double the trade in non-petroleum products to USD 100 billion by 2030.**
- **Strategic Technology Collaborations:** India is leveraging minilateral platforms to advance its technology and innovation capabilities.
  - For example, **India's partnership with Japan and the USA under the Quad** focuses on **semiconductor manufacturing.**
    - India will establish a **multi-material semiconductor fabrication unit in Jewar, Uttar Pradesh**, following an agreement with the US.
- **Climate Leadership through Specialized Coalitions:** India leads minilateral climate action initiatives, such as the **International Solar Alliance (ISA)**, focusing on solar energy solutions for developing nations.
  - Also, the **Global Biofuels Alliance,** launched during **India's G20 presidency,** marks a significant step towards sustainable energy transition.
  - This shows India's leadership in climate-focused minilateral frameworks to tackle specific global challenges.
- **Building South-South Cooperation:** India is at the forefront of fostering minilateral South-South cooperation to promote development in the Global South.
  - The **India-Brazil-South Africa (IBSA) Dialogue Forum** focuses on poverty alleviation, trade, and sustainable development.
  - **In 2023, India hosted the Voice of the Global South Summit**, bringing together countries to discuss global inequalities and reforms in multilateral systems.
- **Advancing Supply Chain Resilience:** India has become a crucial player in minilateral efforts to build resilient and diversified global supply chains.
  - Through the **India-Australia-Japan Supply Chain Resilience Initiative (SCRI),** India is facilitating global supply chain diversification **with India as a major beneficiary.**

What Challenges does India Face in Navigating Minilateralism?

- **Balancing Strategic Autonomy with Partnerships:** India's historical **non-alignment policy conflicts** with deeper alignment required in minilateral frameworks.
  - For instance, **QUAD Alliance** raises concerns about India's **strategic autonomy** and its balancing act with Russia, a long-term defense partner.
  - India procured **36% of its defense equipment from Russia in 2023,** while simultaneously engaging in Quad maritime exercises with the U.S.
  - This duality complicates India's ability to commit fully to any singular minilateral agenda.

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- **Managing Diverging Interests Among Partners:** Minilateral frameworks often involve countries with conflicting priorities, **making consensus-building challenging for India.**
  - In the Quad**, the US's strong anti-China stance contrasts with India's cautious approach** due to its economic ties with China, as its largest trading partner in 2023-24.
  - Such divergences can dilute the effectiveness of joint actions and strain India's leadership role within these alliances.
- **Uneven Focus on Key Issues:** Minilateral frameworks often focus narrowly on specific goals, sidelining broader issues critical to India's interests.
  - For instance, the Quad emphasizes Indo-Pacific security but offers limited collaboration on **climate change or WTO reforms,** key areas for India.
  - India, in pursuit of its sustainability goals, requires substantial climate finance, estimating the need for around **$2.5 trillion for its climate change by 2030,** underscoring the need for diversified international cooperation.
- **Resource and Capacity Constraints:** India's institutional capacity and financial resources are stretched thin, limiting its ability to lead or actively participate in multiple minilateral forums.
  - For example, **managing roles in the International Solar Alliance, the Quad, and the BRICS** simultaneously requires significant diplomatic and financial bandwidth.
  - **India's defense budget, at $72.6 billion in 2023, is already strained,** leaving limited room for additional commitments.
- **Risk of Marginalization in Global Institutions:** Over-reliance on minilateralism risks **sidelining India in traditional multilateral platforms** where larger reforms are necessary.
  - For instance**, India's push for UN Security Council reforms** remains stalled, with little progress despite its active role in minilateralism.
  - This raises concerns that focusing on smaller alliances might undermine its long-term goals for global institutional reform.
- **Lack of Cohesive Domestic Consensus:** India faces domestic opposition to deeper minilateral commitments due to concerns about sovereignty and over-dependence on foreign alliances.
  - For instance**, debates around joining RCEP highlighted** fears about adverse impacts on domestic industries, **leading India to opt out in 2020.**
  - This reflects internal challenges in aligning national interests with international commitments.
- **Overlapping Frameworks and Duplication:** The proliferation of minilateral platforms risks duplicating efforts and creating inefficiencies.
  - For example**, India is part of both the Quad and I2U2**, which overlap in areas like technology and infrastructure cooperation.
  - Managing coherence among these frameworks is challenging, especially as partners prioritize different agendas in each grouping.

What Measures can India Adopt to Balance Minilateralism with Multilateralism?

- **Champion Reforms in Multilateral Institutions:** India can advocate for reforms in multilateral platforms like the **UN, WTO, and IMF** to make them more inclusive and efficient.
  - It should push for **UN Security Council reforms,** leveraging its growing global stature and alliances in the Global South.
  - By collaborating with minilateral partners like **Brazil and South Africa in forums such as IBSA,** India can create momentum for these reforms.
- **Strengthen Regional Multilateral Frameworks:** India should work to revitalize and strengthen **SAARC and BIMSTEC** while using minilateralism to address specific regional issues.
  - For example, India could propose linking the **Quad's maritime initiatives with BIMSTEC's blue economy projects** to ensure broader regional cooperation.

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- **Develop a "Hybrid Diplomacy" Model:** India can create a structured hybrid approach where **minilateralism complements multilateralism, ensuring neither undermines the other.**
  - For instance, India could expand the **International Solar Alliance (ISA)** by integrating more countries from the Global South while using smaller coalitions like the Quad to expedite technology transfers.
- **Establish Leadership in Global South Coalitions:** India can focus on leading the Global South in multilateral forums while engaging in targeted minilateral initiatives for specific challenges.
  - Building on the G20 presidency in 2023, India could **institutionalize the Voice of the Global South Summit** as an annual multilateral platform.
  - **With over 60% of the world's population in the Global South**, India can act as a bridge between smaller coalitions and larger multilateral bodies.
- **Align Minilateral Agendas with Multilateral Goals:** India can align its minilateral initiatives with broader multilateral goals like the **UN's Sustainable Development Goals (SDGs)**.
  - For example, India could integrate the **Quad's technology-sharing initiatives with UNDP programs** to achieve SDG 9 (industry, innovation, and infrastructure).
  - India's domestic renewable energy targets, aimed at 500 GW capacity by 2030, can also be **aligned with ISA's global solar goals.**
- **Leverage Economic Diplomacy for Multilateral Impact:** India should use its minilateral economic partnerships to influence multilateral trade policies.
  - For instance, India could integrate the **India-UAE-Israel trilateral trade initiatives** with larger trade blocs like the **African Continental Free Trade Area (AfCFTA).**
  - **With AfCFTA covering 54 countries,** this linkage can amplify India's economic and multilateral influence.
- **Enhance Regional Connectivity for Multilateral Integration:** India can use its leadership in regional connectivity projects to bridge the gap between minilateral and multilateral initiatives.
  - For example, India could expand the **India-Bangladesh-Nepal cross-border** energy trade initiative to include **BIMSTEC countries**, aligning with broader multilateral energy cooperation.
  - India is exporting **1,160 MW of electricity to Bangladesh,** showcasing its potential as a regional energy hub.
- **Promote Plurilateralism as a Bridging Mechanism:** India could advocate for plurilateral agreements as an intermediate step between **minilateralism and multilateralism.**
  - For example, India could push for a plurilateral agreement on **global vaccine manufacturing standards,** building on its Quad Vaccine Initiative.
  - India is already a **global vaccine leader**, producing over **60% of the world's vaccines,** giving it credibility to lead such efforts.
- **Advocate for Multilateral Digital Governance:** India can use its leadership in minilateral digital partnerships to push for global digital governance norms through the UN and WTO.
  - For example, India could propose linking the **India-EU Connectivity Partnership with multilateral frameworks like the Digital Public Goods Alliance.**
  - **India's Aadhaar system,** the largest biometric database globally, could be a blueprint for scalable digital governance solutions.

Conclusion:

Minilateralism is reshaping global governance by **offering agile solutions to regional challenges through targeted partnerships**. India's leadership in this shift, particularly in frameworks like the **Quad**, enhances its global standing while securing strategic interests. However, the limited scope of these coalitions poses challenges for addressing broader global issues. To strike a balance, **India should champion reforms in multilateral institutions, adopt a hybrid diplomacy model**, and align minilateral agendas with broader global goals, ensuring both regional and global cooperation thrive.

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Reforming India's Manufacturing Sector

This editorial is based on "Elevating manufacturing to global standards" which was published in The Hindu Business Line on 10/12/2024. The article brings into picture India's ambitious goal to elevate manufacturing's GDP contribution from 15% to 25% through reforms like the Omnibus Technical Regulation, focusing on quality standardization, global competitiveness, and sustainable growth.

Tag: GS Paper - 3, Industrial Policy, Infrastructure, Growth & Development

India stands at a critical juncture in its **manufacturing** journey, with an ambitious vision to elevate the sector's contribution to GDP from **15% to 25% through strategic regulatory reforms**. The introduction of the **Machinery and Electrical Equipment Safety (Omnibus Technical Regulation) Order, 2024 (**that sets mandatory safety standards for machinery and electrical equipment in India**)represents** a transformative approach to **standardizing product quality, enhancing global competitiveness, and creating a robust ecosystem for industrial growth.** This strategic intervention signals India's commitment to building a manufacturing sector that is **innovative, sustainable, and globally competitive.**

What is the Current Status of India's Manufacturing Sector?

- **About:** Manufacturing is emerging as a critical pillar of India's economic growth, contributing significantly to GDP and employment.
  - Before the pandemic, the sector contributed **16-17% of India's GDP**, employing **27.3 million workers**.
    - The government envisions increasing this share to **25% by 2025**.
  - By 2030, India aims to add over **US$ 500 billion annually** to the global economy, reflecting its strategic role in the global supply chain.
- **Sectoral Growth and Performance:** India's manufacturing sector has demonstrated robust growth in recent years, driven by increased output, exports, and domestic demand.
  - The **HSBC Manufacturing PMI** reached a **16-year high of 59.1** in March 2024, indicating strong increases in output, new orders, and job creation.
  - **Manufacturing exports** hit an all-time high of **US$ 447.46 billion in FY23**, registering a **6.03% growth** over FY22.
- **Investment and Employment Trends: FDI inflows in manufacturing** reached **US$ 165.1 billion**, marking a **69% increase** over the past decade.
  - Employment in the manufacturing sector has grown steadily, from **5.7 crore in 2017-18** to **6.24 crore in 2019-20**, with further job creation driven by PLI incentives.

What are the Key Growth Drivers of India's Manufacturing Sector?

- **Government Initiatives and Policy Reforms:** The government has launched flagship initiatives like **"Make in India" and "Gati Shakti"** to boost manufacturing competitiveness and infrastructure.
  - The **Production Linked Incentive (PLI) scheme** covers 14 sectors, expected to generate $500 billion worth of manufacturing output.
  - Also, the manufacturing industry brought in around **USD 21.34 billion in investment in FY22**, reflecting policy effectiveness.
- **Rising Domestic Demand:** India's growing **middle class, urbanization, and rising disposable incomes** drive demand for automobiles, consumer goods, and electronics, creating a strong domestic market for manufacturing.
  - India's **domestic market for electronics is expected to reach $400 billion by 2025,** driven by smartphone and appliance sales.
  - The auto sector witnessed significant growth in 2023, **supported by government EV incentives** like the **Faster Adoption and Manufacturing of Electric Vehicles (FAME) scheme.**

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- **Strategic Trade Agreements and Export Growth**: India's focus on key trade agreements like **CEPA with the UAE** and **negotiations with the EU and UK opens new export markets for manufactured goods**.
  - This is complemented by diversification away from Chinese imports.
  - India's exports rose **6%** to $447 billion in FY23. The **India-UAE CEPA alone** is projected to increase bilateral trade to **$100 billion before 2030.**
- **Technological Advancements and Industry 4.0:** Adoption of **automation, IoT, AI, and robotics** is transforming Indian manufacturing into a high-value, technology-driven sector, increasing productivity and reducing costs.
  - **Industry 4.0** is at an inflection point in Indian manufacturing, with **more than two-thirds of Indian manufacturers** embracing the digital transformation by **2025**
  - The government's **Digital India Campaign** complements this by enhancing tech adoption, especially among SMEs.
- **Rising Investments in Green Manufacturing:** Focus on sustainability and clean energy is driving green manufacturing practices in India.
  - The **National Green Hydrogen Mission** and renewable energy projects incentivize industries to adopt environmentally sustainable methods.
  - **India aims to produce 5 million metric tons of green hydrogen annually by 2030. Renewable energy capacity stands at 125 GW (2023)**, supporting manufacturing processes with affordable, green electricity.
- **Resilience in Global Value Chains (GVCs):** India's focus on becoming an alternative to China for global manufacturing companies aligns with **global diversification trends.**
  - Policies like the PLI scheme aim to integrate India into **critical GVCs like electronics and pharmaceuticals.**
  - In April 2021, India, Japan, and Australia launched the **Supply Chain Resilience Initiative (SCRI)** to diversify and strengthen supply chains across the Indo-Pacific region
  - India is the **3rd largest producer of Active Pharmaceutical Ingredients** accounting for an 8% share of the **Global API Industry**, boosting its position in GVCs.
- **Support for MSMEs in Manufacturing:** Micro, Small, and Medium Enterprises (MSMEs) form the backbone of manufacturing and are supported by government measures like the **Emergency Credit Line Guarantee Scheme (ECLGS)** and technology upgradation programs.
  - MSMEs contribute around 30% of India's GDP, over 45% of India's exports. The **ECLGS** has guaranteed **1.19 crore loans worth ₹3.68 lakh** crore, providing critical financial support to these enterprises.
- **Sector-Specific Growth Catalysts:** Key sectors such as **automotive, pharmaceuticals, and textiles** have witnessed targeted growth through reforms, investment incentives, and global partnerships.
  - **India is now the world's largest manufacturer of two-wheelers.** India's textile and apparel exports reached **$44.4 billion in the fiscal year 2021-22**, supported by schemes like "**Technical Textiles Mission."**
- **Renewed Focus on Self-Reliance (Aatmanirbhar Bharat):** The self-reliance campaign promotes domestic production of critical goods like **electronics, defense equipment, and semiconductors,** reducing import dependency and creating local jobs.
  - India unveiled a $10 billion semiconductor manufacturing incentive plan in 2023, aiming to develop a domestic semiconductor industry.
    - In December 2021, the Centre had announced the production-linked incentive (PLI) scheme to promote setting-up of semiconductor and display fabs, as well as **chip packaging, assembly and testing facilities.**
  - **Defense manufacturing output reached ₹1 lakh crore in FY23,** with exports growing by **334% in 2017-2022.**

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Why India's Manufacturing Sector Lags Behind Global Standards?

- **Weak Infrastructure and Logistics Bottlenecks:** India suffers from **poor logistics infrastructure,** which escalates costs and affects competitiveness. Power outages and inadequate transport networks hinder supply chains and production efficiency.
  - **Logistics costs in India account for 14-18% of GDP** compared to **8-10% in developed nations.**
  - Despite the Gati Shakti initiative, India ranked **38th** in the **World Bank's Logistics Performance Index 2023.**
- **Policy Inconsistencies and Bureaucratic Hurdles:** Frequent changes in **trade and taxation policies,** along with burdensome regulatory requirements, create an unstable investment climate. Complex land acquisition laws further delay projects.
  - India ranks **63rd in the Ease of Doing Business rankings (2020)** and issues like **contract enforcement (ranked 163rd)** and land acquisition delays still deter investors.
    - Examples include the **delayed POSCO steel plant project in Odisha (later suspended).**
- **Labor Market Challenges:** Lack of implementation of **Four Labour Codes** deter scalability and flexibility for industries. The **informal workforce dominates manufacturing**, leading to inefficiencies and lower productivity.
  - The share of contract workers in India's formal manufacturing workforce has grown from **23.1% in 2002-03 to 40.2% in 2021-22.**
  - For instance, in **October 2024**, over 1,000 workers at Samsung Electronics' home appliances plant in Tamil Nadu **protested for higher wages and union recognition.**
- **Inadequate R&D and Technology Adoption:** India's manufacturing largely depends on **outdated technology due to low R&D investment and lack of innovation**. This restricts value addition and diversification
  - **India's R&D spending is 0.7% of GDP**, much lower than **South Korea (4.8%) or China (2.4%)**.
  - For instance**, India's EV ecosystem heavily depends on Chinese imports for lithium-ion batteries**, with **limited local research into alternatives like solid-state batteries or sodium-ion technology.**
- **Import Dependence for Key Inputs** High reliance on imported raw materials and components increases vulnerability to global supply chain disruptions. This impacts self-reliance and raises input costs.
  - **India's trade deficit with China reached $85 billion in FY 2023-24** due to dependency on critical inputs like semiconductors and electronics. This undermines initiatives like **"Make in India".**
- **Global Trade Integration Deficiencies:** India's limited participation in global value chains (GVCs) restricts its ability to compete internationally. A protectionist stance on trade policies exacerbates this issue.
  - India's share in global merchandise exports is **1.8% compared to China's 14.7%.**
  - In **2021, India chose not to join RCEP,** potentially losing opportunities to integrate into GVCs.
- **Competition from Emerging Markets:** Countries like **Vietnam and Bangladesh** offer better business environments with lower labor and operational costs, attracting industries shifting away from China.
  - Bangladesh is a garment sector powerhouse, having seen exports surge by **92% to $47 billion in 2023** (though **currently declining due to political unrest, India still lags in fully tapping the potential.**)
- **Digital and Skill Gaps:** The lack of **digital infrastructure and skilled manpower restricts adoption of advanced manufacturing techniques**. Training programs remain insufficient to meet industry needs.
  - The **India Skills Report 2023 revealed only 48.7% of India's workforce was employable**. Meanwhile, India's rank in the Global Innovation Index improved to **40th in 2023**, but tech adoption in SMEs remains low.
- **Fragmented MSME Sector:** India's manufacturing is dominated by micro, small and medium enterprises (MSMEs) that **lack access to credit, technology, and export markets, limiting their growth potential.**

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- Among the 64 million MSMEs in the country, **only 14% have access to credit.** Initiatives like the Emergency Credit Line Guarantee Scheme have only partially addressed this issue.

What Measures to Raise India's Manufacturing Sector to Global Standards?

- **Enhance Infrastructure and Reduce Logistics Costs:** Investments in **multi-modal transport systems, port connectivity**, and **dedicated freight corridors** should be accelerated under the Gati Shakti initiative.
  - Improved infrastructure can reduce transportation costs and enhance supply chain efficiency, enabling global competitiveness.
  - Strengthen the **Eastern and Western Dedicated Freight Corridors** to reduce freight costs by up to **25%**. Expand port capacity and automation at major ports, such as the **recently modernized JNPT terminal.**
  - Establish "**Component Manufacturing Clusters**" in major industrial regions to enhance local sourcing.
- **Simplify Regulatory Frameworks:** Streamlining **labor laws, land acquisition processes, and environmental clearances** can reduce compliance costs and attract foreign direct investment (FDI).
  - A **unified single-window clearance system** for manufacturing projects should be implemented.
  - Digitize the entire approval process for MSMEs to foster ease of doing business at the grassroots level.
- **Promote Research and Development (R&D):** Increase public and private sector investments in R&D and **incentivize innovation through tax breaks and subsidies.**
  - Collaborative R&D ecosystems between industry and academia should be developed learning from **Tesla's Gigafactories.**
  - Introduce a **"Manufacturing Innovation Fund"** to finance R&D in emerging areas like **advanced materials, AI-driven production, and semiconductors.**
- **Boost Technology Adoption and Industry 4.0:** Promote widespread adoption of automation, robotics, IoT, and AI in manufacturing processes to **improve productivity and quality**.
  - Subsidized technology adoption schemes for MSMEs can democratize access to advanced tools
  - Expand the scope of the **PLI scheme to include incentives for firms adopting Industry 4.0 practices.** For instance, **tax credits for manufacturers** investing in IoT-enabled machines can be introduced.
- **Integrate into Global Value Chains (GVCs):** Negotiate trade agreements to align India's manufacturing with global supply chains in **electronics, textiles, and pharmaceuticals.** Strengthening export-oriented infrastructure, such as **SEZs, can further facilitate this integration.**
  - **Establish export processing zones** near ports with tax exemptions and quick approvals.
  - Leverage the **India-UAE CEPA** to expand the footprint of Indian goods in the **Middle East and Africa.**
  - Develop robust strategies to reduce vulnerability to global crises such as supply chain disruptions, pandemics, or geopolitical tensions.
    - Establish a **"Critical Input Reserve" for sectors like semiconductors and rare earth metals.**
- **Develop Sector-Specific Strategies:** Focus on **high-potential sectors like electronics, automobiles, pharmaceuticals,** and defense manufacturing.
  - Introduce targeted incentives for high-value manufacturing and product diversification in these areas.
  - Scale up the **Semiconductor Mission with partnerships like the one with Foxconn** to develop a robust semiconductor ecosystem.
  - Expand the **FAME-II scheme to include incentives for EV battery manufacturing.**
  - Expand initiatives like the **Mega Food Parks Scheme** and **Textile Clusters.**

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- **Strengthen MSMEs with Technology and Credit Access:** Facilitate affordable financing and modern technology adoption for MSMEs, which form the backbone of Indian manufacturing.
  - **E-commerce platforms** should also be leveraged to connect MSMEs with global markets.
- **Focus on Skill Development:** Upskilling and reskilling programs should align with the requirements of **advanced manufacturing technologies** and global production standards following Ireland's industrial upskilling initiatives.
  - Programs like **Pradhan Mantri Kaushal Vikas Yojana should integrate specialized training modules.**
  - Establish **Centers of Excellence (CoEs)** in collaboration with global tech companies for specialized training.
- **Encourage Green-Sustainable-Circular Manufacturing:** Adopt green practices to **align Indian manufacturing with global environmental standards**. Incentivize industries to transition to renewable energy and reduce carbon footprints.
  - Expand the **National Hydrogen Mission to decarbonize energy-intensive industries** like steel and cement. Expedite **green bonds** for financing sustainable manufacturing practices.
  - Mandate Extended Producer Responsibility (EPR) frameworks in sectors like electronics and automobiles.
- **Leverage Digital Transformation:** Adopt digital tools like **blockchain for supply chain management and big data analytics to predict market trends.** Promote digital platforms for efficient coordination between stakeholders.
  - Expand Digital India initiatives to **digitize manufacturing units, particularly SMEs.** Implement blockchain in high-export sectors like pharmaceuticals to ensure transparency and traceability.
- **Enhance Public-Private Partnerships (PPPs):** Expand the role of private enterprises in **infrastructure, technology, and skill development** by leveraging PPP models.
  - Develop PPPs in **smart manufacturing parks,** similar to Japan's collaborative manufacturing hubs.
  - The **Bengaluru-BIAL ITIR (Information Technology Investment Region)** is a successful PPP model for infrastructure and industrial growth.
- **Boost Quality Standards and Certifications:** Promote adherence to international quality certifications like **ISO and CE**, ensuring Indian products meet global benchmarks.
  - Introduce **sector-specific "Quality Upgradation Missions"** for textiles, automotive, and electronics.
  - For example, subsidies for obtaining CE certifications for exports to the EU could improve product acceptability.
- **Revitalize Traditional and Heritage Industries:** Integrate India's rich artisanal and traditional industries like **handicrafts and ceramics into the mainstream manufacturing** economy by modernizing processes and scaling up.
  - Extend the "**SFURTI Scheme**" **(Cluster Development for Artisans**) to include tech-enabled handicraft units.
  - Provide **export incentives for modernized Khadi and handloom products** to target global premium markets.

Conclusion:

India's manufacturing sector holds immense potential to **drive economic growth, job creation, and global competitiveness.** By addressing critical challenges such as infrastructure gaps, policy inconsistencies, and technological lag, the **sector can align with global standards.** Government initiatives like the **PLI scheme, National Manufacturing Policy, and green manufacturing effort**s are creating a robust foundation for sustainable growth.

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Towards Universal Health Coverage

This editorial is based on "Whither universal health coverage in India?" which was published in The Financial Express on 12/12/2024. The article brings into picture the challenges in India's journey towards Universal Health Coverage (UHC), highlighting limited insurance coverage (41% households) and poor quality of public healthcare. It emphasizes the need to reduce inequalities, improve services, and ensure equitable health outcomes nationwide.

Tag: S Tag: GS Paper - 2, Health, Government Policies & Interventions, GS Paper - 3, Government Budgeting, Planning

India's journey towards **Universal Health Coverage (UHC)** has been marked by significant challenges and incremental progress. Despite implementing various health schemes since 1948, **only 41% of Indian households have health insurance**, and **half avoid government health facilities due to poor care quality.** The path to true universal health coverage demands a focused approach that prioritizes **reducing inequalities, improving service quality, and achieving consistent health outcomes** across all socioeconomic groups and regions.

What is the Current Status of India's Healthcare Sector?

- **About**: The Healthcare Sector reached a valuation of US$ 372 billion in 2023, employing 7.5 million people, with significant growth in **telemedicine, health-tech, and medical tourism.**
  - India's hospital market, valued at **US$ 98.98 billion in 2023**, is projected to double by 2032.
  - The telemedicine market is set to grow to **US$ 5.4 billion by 2025**, while the **e-health market may hit US$ 10.6 billion** in the same period.
- **Doctor-Population Ratio and Medical Tourism:** India's doctor-to-population ratio stands at 1:854, including both allopathic and AYUSH practitioners.
  - Additionally, **medical tourism has positioned India as a global hub, contributing US$ 7.69 billion in 2024**, and projected to grow to US$ 14.31 billion by 2029.
- **Foreign Investment**: Foreign investments in drugs and pharmaceuticals reached **US$ 22.57 billion by March 2024**, signaling robust growth and global confidence in India's healthcare ecosystem.

What are the Issues Hindering Universal Health Coverage in India?

- **Inadequate Public Health Expenditure and Weak Primary Healthcare System:** Despite being the world's most populous country, India spends only **1.9% of its GDP on healthcare (Economic Survey 2023-24)**
  - India's healthcare pyramid is inverted, with an over-reliance on **tertiary care and neglect of primary health systems.**
    - Diseases like diabetes and hypertension, which can be managed at the primary level through early screening and intervention, often go undiagnosed until complications arise, pushing patients to tertiary care.
    - In states like **Uttar Pradesh and Bihar**, the **absence of robust screening programs** at the **primary level exacerbates this issue.**
- **Regional Disparities in Healthcare Access:** Healthcare infrastructure is unevenly distributed, with urban areas enjoying better facilities than rural ones.
  - For example, **while 70% of India's healthcare professionals are concentrated in urban regions,** 65% of the population resides in rural areas.
  - A recent **Rural Health Statistics**, highlights significant shortfalls in rural CHCs, with over **80% gaps in surgeons, physicians, pediatricians**, and **around 75% in obstetricians and gynecologists.**
- **High Burden of Non-Communicable Diseases:** India is witnessing a rapid transition to NCDs, which now account for **65-66% of total deaths (WHO, 2022).**

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- Diseases like **diabetes, cardiovascular disorders, and cancers** strain the healthcare system, which is still focused on communicable diseases.
- Factors such as pollution, poor sanitation, and malnutrition exacerbate health inequalities.
  - Air pollution alone caused **1.67 million deaths in India in 2019.** Furthermore, **40% of rural households lack access to safe drinking water**, increasing vulnerability to diseases like **cholera and typhoid.**

➢ **Inefficiencies in Implementation of Government Schemes:** Flagship schemes like Ayushman Bharat aim to provide health coverage to **50 crore citizens**, yet their reach is hampered by poor awareness and uneven implementation.

- According to a recent CAG report, almost 7.5 lakh people in the **Ayushman Bharat Scheme's beneficiary database** were linked with a **single cell phone number.**
- The report also said that **patients earlier shown as "dead" continued to avail treatment under the scheme.**
  - The maximum number of such cases were in Chhattisgarh, Haryana, Jharkhand, Kerala and Madhya Pradesh.

➢ **Poor Health Insurance Penetration:** India's **95% population remain uninsured,** 73% lack health coverage.

- The **unorganized sector and informal workers,** who form **90% of the workforce,** remain excluded from employer-based insurance.
- As a result, high **Out-of-Pocket Expenditure** on health is impoverishing some **55 million Indians annually,** with over 17% households incurring catastrophic levels of health expenditures

➢ **Fragmentation in Healthcare Governance:** India's federal structure often leads to fragmented healthcare policies, with limited coordination between central and state governments.

- For instance, during Covid-19, the **lack of a uniform testing policy created confusion and inefficiencies** in disease management.
- States with better health governance, like **Kerala**, outperformed others in managing outbreaks, **reflecting disparities in administrative capacity.**

➢ **Low Focus on Preventive Healthcare:** Preventive measures such as **immunization, screening, and lifestyle interventions** are underutilized despite their cost-effectiveness.

- India's full immunization coverage was **only 76.4% in 2021** (NFHS-5), leaving millions of children vulnerable to preventable diseases.
- Additionally, the **Fit India Movement and Poshan Abhiyaan face slow implementation**, limiting their impact on reducing long-term health burdens.

➢ **Limited Use of Technology and Digital Health:** While initiatives like **Ayushman Bharat Digital Mission (ABDM)** aim to digitize health records, digital penetration remains low in rural areas.

- The **absence of standardized data exchange protocols** complicates seamless information sharing between different healthcare systems, impeding coordinated patient care and the effective implementation of nationwide health initiatives like the **ABDM.**

➢ **Dependence on Private Sector:** Overburdened public hospitals often divert individuals to seek treatment in the costlier private sector.

- Almost **60% of all hospitalizations, and 70% of out-patient services are delivered by the private sector (NSSO's 75th Round survey on Social Consumption of Health, 2017-18),**
- The unregulated nature of private healthcare leads to **price gouging and inequitable access,** undermining the vision of affordable UHC.

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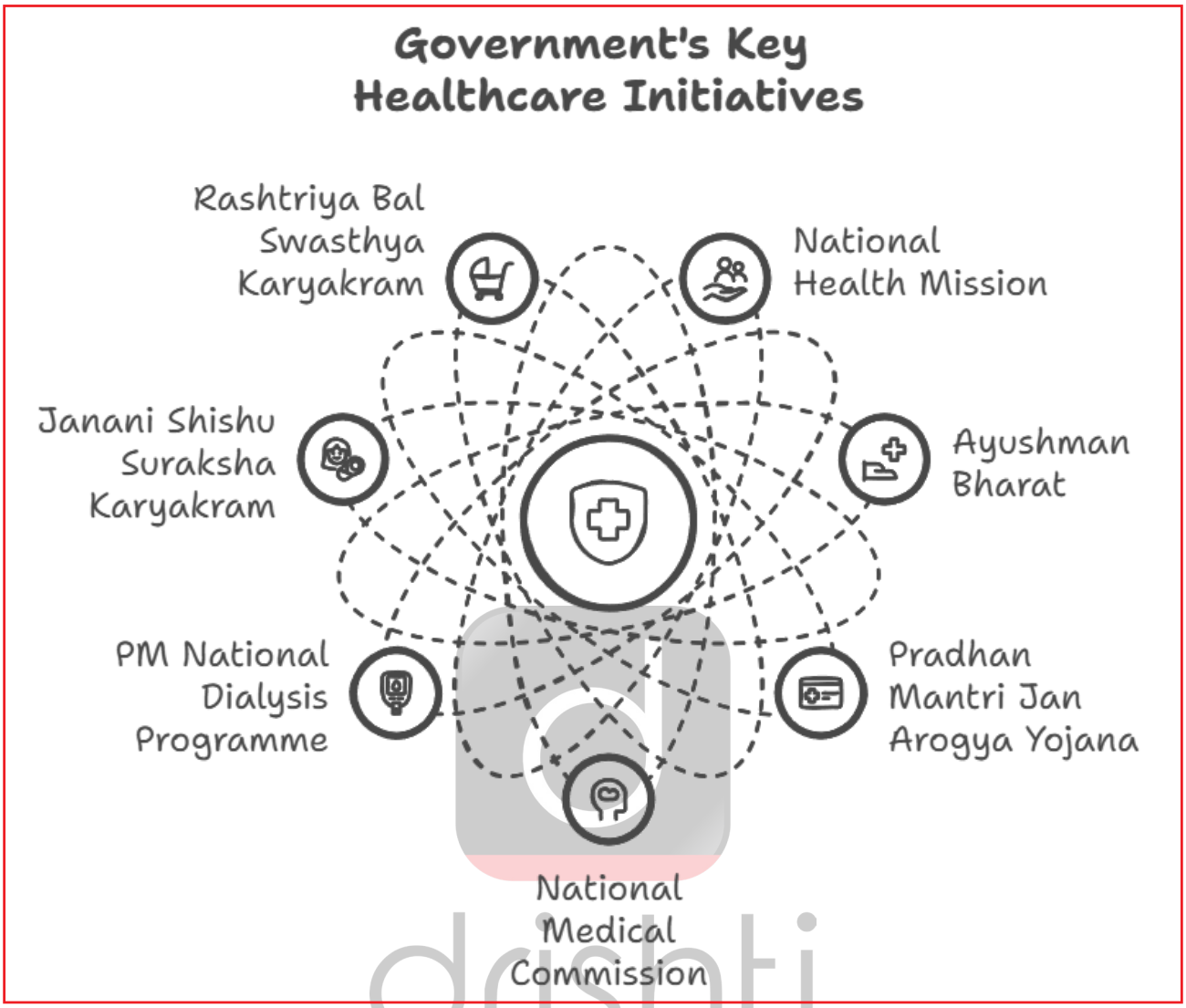

What Measures can be Adopted to Accelerate Universal Health Coverage in India?

- **Enhancing Public Health Expenditure and Health Insurance:** India must increase its public health spending to at least **2.5% of GDP by 2025**, as envisioned in the National Health Policy, 2017.
  - This can fund better infrastructure**, more healthcare workers, and ensure essential medicines at public facilities.**
  - Expanding programs like the **PM Ayushman Bharat Health Infrastructure Mission,** which focuses on creating critical care hospitals in every district, will bridge infrastructure gaps.
  - **Expanding insurance through targeted schemes** will further reduce the financial burden on vulnerable populations.
  - India can draw lessons from the **Beveridge Model** (**UK, Nordic countries**) by implementing universal healthcare funded through taxation, ensuring equitable access to essential services.
    - And also learning from the **Bismarck Model (France, Japan),** India can adopt a framework of insurance-based healthcare with both employer and employee contributions.

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- **Strengthening Primary Health Care:** Revamping primary health centers (PHCs) and sub-centers with **adequate staffing, equipment, and medicines is critical.**
  - Initiatives like the **Ayushman Arogya Mandir** under Ayushman Bharat should be expanded with a **greater focus on preventive care and management of non-communicable diseases (NCDs).**
  - For instance, **integrating telemedicine services like eSanjeevani with these centers** can improve access in rural areas
  - Mandatory preventive health screenings for NCDs and other diseases at the PHC level can reduce the long-term disease burden.
    - Implementing large-scale health camps, similar to the **Rashtriya Swasthya Bima Yojana (RSBY) health drives,** can detect issues early, especially in rural and tribal areas.
- **Addressing Workforce Shortages:** A robust health workforce requires scaling up **medical and paramedical education** while improving working conditions.
  - Expanding the **Skill India initiative to include healthcare-specific training for nurses, midwives,** and community health workers will address shortages.
  - For example, **increasing seats in medical colleges and incentivizing rural postings through higher pay and career advancement** opportunities can bridge the rural-urban divide.
    - **Assam introduced financial incentives for doctors in remote regions,** setting a replicable precedent.
- **Leveraging Digital Health Technology:** Accelerating the rollout of the **Ayushman Bharat Digital Mission (ABDM)** to create a unified digital health ID can streamline patient records and improve healthcare delivery.
  - Establishing internet connectivity in rural areas through **BharatNet** and providing digital training for health workers will ensure inclusivity.
  - The integration of telemedicine platforms like **Tele-Manas for mental health can further address unmet needs.**
- **Focus on Preventive Healthcare:** Preventive measures such as **vaccination, health education, and lifestyle modifications** can reduce disease burden and costs.
  - Expanding the **Poshan Abhiyaan's scope to address adult malnutrition alongside** childhood malnutrition will combat rising non-communicable diseases.
  - Strengthening **urban sanitation under the Swachh Bharat Mission 2.0** and increasing funding for National Programmes like the **NPCDCS (Non-Communicable Diseases Control Program)** will have far-reaching impacts.
- **Public-Private Partnerships:** PPPs can be leveraged for infrastructure development, diagnostics, and tertiary care.
  - Schemes like the **Viability Gap Funding (VGF) for private hospitals** in underserved areas can improve access without excessive costs.
  - For example, **Rajasthan's Mukhyamantri Free Medicine Scheme partnered with pharma companies** to supply affordable drugs. Expanding similar collaborations can enhance service delivery.
- **Reducing Regional Disparities:** Central schemes should **incentivize states with lower health indices** to invest in healthcare infrastructure and workforce development.
  - Linking **NITI Aayog's Health Index** rankings with performance-based grants under the **15th Finance Commission** can motivate lagging states like Bihar and Uttar Pradesh to improve.
  - **Kerala's decentralized governance model,** which allocates higher budgets to local health institutions, provides a roadmap for success.
- **Strengthening Regulatory Mechanisms:** Ensuring price control of essential medicines and standardizing treatment costs across private hospitals are critical.
  - Expanding the scope of the **National Pharmaceutical Pricing Authority (NPPA)** and mandating hospitals to display transparent pricing under the Clinical Establishments Act will curb exploitation.
  - Price reductions of cardiac stents and knee implants have already saved patients money, showcasing the efficacy of regulation.

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- **Investing in Research and Indigenous Innovations:** India must strengthen research and innovation by funding institutes like ICMR to **develop affordable, indigenous healthcare solutions.**
  - Public health innovations, such as the locally developed **Covaxin during Covid-19,** demonstrate the potential of self-reliance.
  - Establishing regional research hubs can address localized health challenges, such as vector-borne diseases in the Northeast.
- **Integrating Traditional Medicine with Modern Healthcare:** India's vast repository of traditional medicine through **AYUSH (Ayurveda, Yoga, Unani, Siddha, and Homeopathy)** can complement modern healthcare.
  - Integrating AYUSH practitioners into the Health and Wellness Centres (HWCs) under Ayushman Bharat can reduce the burden on allopathic practitioners and provide culturally accepted alternatives.
- **Comprehensive Mental Health Coverage:** Mental health remains underfunded and stigmatized despite rising needs.
  - Scaling up the **National Mental Health Programme (NMHP)** and integrating it with primary healthcare through telemedicine platforms like Tele-Manas can make services accessible.
- **Integrating One Health Approach:** The **One Health approach,** which recognizes the interconnectedness of human, animal, and environmental health, is vital for achieving universal health coverage.
  - Establish **integrated monitoring systems for zoonotic diseases** such as **Nipah and Avian Influenza,** ensuring rapid response mechanisms.
  - Expand the **scope of the National Centre for Disease Control (NCDC)** to collaborate with veterinary and wildlife departments.

Conclusion:

While India has made strides in its pursuit of **Universal Health Coverage,** several significant challenges remain. These include inadequate public health expenditure, regional disparities, poor insurance penetration, and an overburdened healthcare system. To achieve UHC, India must focus on **enhancing public health spending, strengthening primary health care, and addressing inefficiencies in government schemes.**

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Advancing Towards One Nation, One Election

This editorial is based on "Union Cabinet approves 'one nation, one election' Bill" which was published in The Financial Express on 12/12/2024.The article brings into picture the ambitious "One Nation, One Election (ONOE)" plan approved by the Union Cabinet, aiming to synchronize India's electoral processes. Based on the recommendations of a high-level panel headed by former President Ram Nath Kovind, the plan seeks constitutional amendments to enable simultaneous elections for the Lok Sabha and state Assemblies in two phases.

Tag: GS Paper - 2, Federalism, Elections, Government Policies & Interventions

The **Union Cabinet** has approved the ambitious **"One Nation, One Election (ONOE)" plan,** a landmark move towards synchronizing **electoral processes across India**. Based on recommendations from a high-level panel headed by former **President Ram Nath Kovind**, the proposal seeks to amend multiple constitutional articles to enable simultaneous elections for the Lok Sabha and state Assemblies. This transformative initiative aims to **implement the simultaneous election model in two phases, potentially revolutionizing India's electoral landscape.**

What is the Historical Evolution of ONOE in India?

- **Pre-Independence Context** The concept of simultaneous elections is rooted in the colonial electoral system under the **Government of India Act, 1935.**
  - Though fragmented, elections were aligned for legislative bodies under British rule.
- **Post-Independence Era (1952-1967)**
  - **First General Elections (1952):** India began its democratic journey with synchronized elections for the Lok Sabha and all State Legislative Assemblies.
  - **Continuation:** Simultaneous elections were successfully conducted in **1957, 1962, and 1967**, ensuring political and administrative stability.

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- **Disruption of Simultaneity (1968-1969)**
  - The cycle was disrupted due to the **premature dissolution of some State Assemblies in 1968-1969**, notably in **Haryana and Kerala.**
  - In 1970, the **Lok Sabha was dissolved before completing its term**, leading to separate election cycles for the Lok Sabha and various State Assemblies.
- **Attempts to Revisit ONOE**
  - **Law Commission of India (170th Report, 1999):** Advocated simultaneous elections, emphasizing the reduction of election-related disruptions and costs.
  - **Parliamentary Standing Committee (2015):** Highlighted the benefits of ONOE, including curbing electoral expenses and ensuring uninterrupted governance.
  - **NITI Aayog Report (2017):** Proposed a roadmap to reintroduce ONOE.

What are the Key Benefits of One Nation One Election?

- **Significant Reduction in Electoral Costs:** Simultaneous elections can drastically cut down the enormous financial burden on the government and political parties.
  - For instance, the **2019 Lok Sabha election** went as a watershed election as the election expenditure escalated to **₹55,000 crore from ₹9,000 crore in 1998**
  - It is estimated that diminishing the frequency of elections could result in savings ranging from **Rs 7,500 crore to Rs 12,000 crore.**
    - This money could instead be allocated to infrastructure, healthcare, and education.
- **Streamlining Governance and Reducing Policy Paralysis:** Frequent elections force governments into perpetual campaign mode, delaying long-term decision-making.
  - For example, during the recent elections, over **24 key development projects were stalled in Ghaziabad, Uttar Pradesh due to Model Code of Conduct restrictions.**
  - ONOE would limit the MCC's imposition to **once every five years,** ensuring uninterrupted governance.
  - Additionally**, policymaking becomes more efficient as governments** focus on development rather than short-term electoral gains.
- **Enhanced Voter Engagement and Turnout:** Repeated elections lead to **voter fatigue, with participation often dropping in by-polls and local elections.**
  - The **2024 Lok Sabha elections witnessed a voter turnout of 65.79%**. This highlights a moderate level of electoral participation across the country.
  - By consolidating elections, **ONOE can re-energize the democratic process**, ensuring voters engage in fewer but more impactful electoral events, potentially boosting overall turnout by **5–10%.**
- **Curtailment of Electoral Malpractices:** The frequency of elections creates multiple opportunities for **vote-buying, misuse of state resources, and deployment of money power**.
  - For example, in the 2024 **state assembly elections in Maharashtra and Jharkhand**, as well as various bye-polls, enforcement agencies seized over **₹1,000 crore worth of cash, liquor, drugs, and freebies.**
  - ONOE can significantly reduce such practices by **restricting election timelines,** making oversight by the Election Commission more focused and effective.
- **Optimized Utilization of Security Forces:** Elections require heavy deployment of security forces, straining their primary duties.
  - For instance, the **Election Commission** sought **3.4 lakh Central Armed Police Forces (CAPFs) personnel** for deployment in a phased manner during the **2024 Lok Sabha election** and Assembly polls in **Andhra Pradesh, Arunachal Pradesh, Odisha, and Sikkim,** leaving gaps in border and internal security management.
  - ONOE would consolidate these deployments into a single cycle, **ensuring better utilization of resources and enhanced national security preparedness.**

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- **Minimizing Disruptions to Economic Activity:** Frequent elections disrupt local economies through extended bans on business activities, such as **transport restrictions, liquor sales, and labor diversions.**
  - For instance, the **Karnataka government faced a ₹150 crore revenue loss** due to the liquor ban imposed during the 2023 state elections.
  - By aligning electoral schedules, ONOE can ensure uninterrupted economic activity.
- **Greater Alignment in Development Goals:** Simultaneous elections can strengthen **cooperative federalism** by aligning the terms of central and state governments.
  - During the implementation of the **Goods and Services Tax (2017),** synchronized efforts between central and state governments accelerated the policy's rollout.
  - ONOE can **institutionalize such collaboration**, ensuring unified strategies in areas like **healthcare, education, and climate action, leading to more cohesive national development.**

What are the Key Challenges Associated with One Nation One Election?

- **Constitutional and Legal Complexities:** Implementing ONOE requires amendments to several constitutional provisions, such as **Articles 83, 85, 172, and 356,** which govern the tenure and dissolution of legislatures.
  - For instance, **synchronizing state elections would necessitate curtailing or extending the tenure of certain assemblies**, raising questions about their democratic validity.
  - Furthermore, **Article 356 (President's Rule)** could disrupt synchronized terms if misused.
- **Potential Threat to Federalism:** Critics argue that ONOE may dilute the autonomy of states, as **local issues could be overshadowed by national campaigns and agendas.**
  - During the 2019 Lok Sabha and Odisha Assembly elections held simultaneously, campaigns largely focused on national issues like the Balakot airstrike.
    - As a result, critical state-level issues, including **agricultural distress in Odisha and unemployment in tribal areas,** received limited focus in public debates.
  - The **Sarkaria Commission (1988) also warned against excessive centralization.** This could erode the spirit of cooperative federalism enshrined in the Constitution.
- **Logistical and Operational Challenges:** Conducting simultaneous elections for the Lok Sabha and all state assemblies would require massive administrative and logistical planning.
  - The Election Commission of India (ECI) estimates that implementing simultaneous elections would require **₹10,000 crore every 15 years** for the procurement and replacement of **new Electronic Voting Machines (EVMs).**
  - Additionally, **managing over 900 million voters simultaneously across 1 million polling stations** (as of 2019) poses unprecedented challenges, especially in remote and conflict-prone areas.
- **Disruption of Democratic Accountability:** Frequent elections act as a **continuous accountability mechanism,** allowing voters to assess governments regularly.
  - For instance, the **2022 Punjab Assembly elections** reflected public dissatisfaction with governance, resulting in a complete regime change.
  - ONOE, by reducing election frequency, **may weaken this system of periodic checks**, giving governments more leeway to delay addressing pressing issues until the end of their term.
- **Political Resistance and Lack of Consensus:** The idea of ONOE faces resistance from various political parties, **particularly regional ones**, who fear losing relevance in a synchronized system.

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- During consultations on 'One Nation, One Election,' 32 political parties supported the proposal, while **15 opposed it,** as per former President Ram Nath Kovind.

- **Disruption Due to Premature Dissolutions:** If a government collapses prematurely in a state or at the center, the **entire synchronized election cycle would be disrupted**.
  - For instance, the **fall of the Karnataka government in 2019** and **Maharashtra in 2022** led to unplanned elections.
  - Synchronizing timelines would either require reimposing President's Rule frequently, **raising concerns about democratic integrity,** or holding **interim elections, undermining the cost-efficiency of ONOE.**
- **Delayed Electoral Justice and Dispute Resolution**: Simultaneous elections could create a **bottleneck for the judiciary in addressing election-related disputes**.
  - Currently, staggered elections allow courts to handle cases in phases, but ONOE would lead to a surge in simultaneous petitions, delaying resolutions.
  - The 2019 elections saw **130 election petitions filed**, the highest ever among all general elections. ONOE could further delay the declaration of results and disrupt governance continuity.

What are the Recommendations of the One Nation, One Election Panel?

The **One Nation, One Election** panel, chaired by former President Ram Nath Kovind, proposed **11 recommendations** to synchronize elections for the Lok Sabha, state assemblies, and local bodies.

- **Phased Synchronization**:
  - **Phase I**: Align election dates for the Lok Sabha and state assemblies.
  - **Phase II**: Synchronize municipal and panchayat elections with these, to be conducted within 100 days of the state and Lok Sabha elections.
- **Continuation of Synchronization**:
  - The President may declare the date of the Lok Sabha's first sitting as the 'appointed date,' ensuring synchronization continuity.
- **Term Adjustment for New Assemblies**: Newly-formed state assemblies may have **shortened terms to align with the next general elections.**

Governance and Implementation

- **Implementation Group**: A dedicated group should oversee and facilitate the execution of simultaneous election reforms.
- **Legislative Amendments**:
  - **Article 324A**: Proposed introduction to facilitate simultaneous elections for Panchayats and Municipalities.
  - **Article 325**: Suggested amendment to establish a unified voter roll and photo ID card for all elections.

- **Managing Hung Houses and No-Confidence Scenarios**
  - **Election in Case of Hung House**: If a hung house or no-confidence motion occurs, fresh elections will be held.
    - The newly elected body will serve only until the term of the ongoing Lok Sabha or state assembly expires.
  - **Term Limitation**: For a newly elected Lok Sabha, the term will extend only until the next synchronized general election. State assemblies will continue until the Lok Sabha's term ends, unless dissolved earlier.
- **Operational Enhancements**
  - **Procurement of Election Equipment**: The Election Commission must proactively plan for procuring essential equipment, such as EVMs and VVPATs, to ensure smooth election management.
  - **Unified Electoral Infrastructure**: The panel recommends a unified voter roll and ID card system across all elections, requiring constitutional amendments and ratification by States.

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What can India Learn from Other Countries Regarding One Nation, One Election?

- **Indonesia**: Indonesia switched to the **'One Nation, One Election' format in 2019**, where the President, Vice-President, and members of both national and regional legislative bodies are elected on the same day.
  - In 2024, Indonesia successfully conducted the **world's largest single-day elections,** involving nearly 200 million voters across five levels: President, Vice-President, Parliament, Regional Assemblies, and Municipal elections.
- **South Africa**: Voters cast ballots for both the **National Assembly and Provincial Legislatures simultaneously.** However, municipal elections are held separately, following a five-year cycle.
- **Sweden**: Sweden operates a proportional electoral system where seats in the **Parliament (Riksdag), County Councils, and Municipal Councils** are allocated based on vote share.
  - These elections occur every four years. Municipal elections follow a five-year cycle, occurring once every five years.

What Measures can be Adopted for Effective Implementation of One Nation, One Election?

- **Pilot ONOE in Union Territories:** Begin implementing **ONOE reforms in Union Territories (UTs) as a proof of concept.**
  - UTs like **Delhi, Puducherry, and Chandigarh** have smaller electorates and simpler governance structures, making them ideal for pilots.
  - This allows refinement of the ONOE model before national rollout.
- **Flexible Election Cycles Based on Regional Readiness:** After syncing Union Territories, transition with introducing region-specific election synchronization rather than enforcing nationwide **uniformity.**
  - States could be grouped regionally **(e.g., North, South, East, West)** to synchronize elections within those zones over 5-10 years.
  - This allows states like **Jharkhand or J&K, which face governance or security issues,** to align election cycles gradually without disrupting national-level synchronization.
  - This approach balances logistical feasibility with federal concerns.
- **Creating a Digital Electoral Management System:** Develop a comprehensive digital platform to manage ONOE's complex logistics.
  - DEMS could integrate **voter rolls, polling booth allocation, candidate filing, and result management.**
  - Pilot **blockchain-based technology for vote recording and counting** to enhance transparency and accuracy.
  - This minimizes administrative delays and ensures robust election management.
- **Strengthening Federal Safeguards for Regional Representation:** Ensure mechanisms are in place to **prevent the overshadowing of state-level issues.**
  - Introduce **mandatory regional debates** or **televised state-specific forums** during synchronized elections to give visibility to local issues.
  - Political funding caps could be tailored to ensure regional parties remain competitive despite large-scale national campaigns.
    - This protects the **democratic diversity crucial to India's federal structure.**
- **Use of Artificial Intelligence for Election Resource Allocation:** AI can help allocate election resources like **personnel, EVMs, and security forces based on region-specific needs.**
  - AI-powered simulations can predict **voter turnout, identify high-risk areas (e.g., conflict-prone regions),** and ensure resource optimization.
  - For instance, algorithms similar to those used in disaster management systems can be adapted for elections.
    - This reduces inefficiencies and prevents delays in simultaneous election management.
- **Conditional Financial Incentives for States to Align Terms:** Offer states **financial incentives like higher devolution of central funds** for aligning their election cycles with ONOE.
  - States agreeing to shorten or extend their assembly terms could **receive additional funding for development projects.**

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- For instance, the **15th Finance Commission recommended state performance-linked grants**, a model that can be repurposed for ONOE compliance. This incentivizes cooperation without imposing mandates.

- **Decentralized Election Monitoring Cells:** Set up regional election monitoring cells to oversee the simultaneous electoral process in a decentralized manner.
  - These cells would operate under the Election Commission but **focus on specific regions, reducing the burden on the central ECI**
  - This localized approach ensures real-time problem-solving and smooth operations.
- **Citizen Engagement through Participatory Democracy Mechanisms:** Encourage citizens to participate in **shaping synchronized elections.**
  - **Host public consultations, online opinion polls, and stakeholder forums** to build awareness and gauge public opinion.
    - For example, **Kerala's participatory budgeting model** can be adapted to gather citizen input on ONOE reforms
  - Introduce **mandatory mid-term reviews** for governments to maintain accountability between synchronized elections.
  - These reviews could include **public feedback surveys, parliamentary performance audits, and RTI-based transparency mechanisms.**
    - For instance, **an online platform like MyGov** could host citizen scorecards for elected officials, ensuring continuous accountability. This mitigates the concern that ONOE reduces voter oversight over governance.
- **Establishment of a Contingency Election Fund:** Create a contingency fund exclusively for handling **unexpected elections due to government collapse.**
  - This fund would be maintained by the Election Commission and **used to manage mid-cycle elections or by-elections** without disrupting synchronization efforts.
  - This avoids financial strain during emergencies while keeping ONOE timelines intact.
- **Gradual Integration of Digital Voting Platforms:** Introduce secure digital voting mechanisms for certain categories of voters**, such as NRIs or urban migrants.**
  - Digital voting could reduce logistical burdens and enable wider participation in synchronized elections.
  - **Estonia's 2005 digital voting model** can serve as a benchmark. This innovation enhances inclusivity and reduces physical resource requirements.

Conclusion:

The "One Nation, One Election" proposal marks a transformative shift in India's electoral landscape, aiming to bring **greater efficiency, reduced costs, and streamlined governance**. The implementation of ONOE will require **careful planning, legislative amendments, and the ability to balance federal autonomy with national interests.** By learning from global precedents and taking a phased approach, India can address these challenges, ensuring that the reforms lead to a more cohesive and functional electoral system.

■■■

Balancing Globalisation with Economic Self-Reliance

This editorial is based on "Globalisation and India" which was published in The Financial Express on 10/12/2024. The article brings into focus globalization's resilience amid crises and India's journey, raising its global economic share from 2% in 1947 to 7.93% in 2023. However, India's future hinges on balancing self-reliance with deeper economic integration.

Tag: GS Paper - 2, Deglobalisation & Protectionism, Effects of Globalization on Indian Society, GS Paper - 3, Growth & Development

Globalisation continues to evolve, demonstrating remarkable **resilience through financial crises, pandemics, and geopolitical tensions. I**ndia stands at a critical juncture, with its economic potential partially realized yet constrained by challenges such as **low labor participation, import restrictions, and socio-political complexities.** Despite raising its global economic share from **2% at independence to 7.93% in 2023**, the nation's future in the global economy hinges on balancing **self-reliance with international economic integration.**

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What are the Major Phases of Globalization in India?

- **Pre-Colonial Period (Ancient and Medieval India):**
  - **Flourishing Trade:** India was a major global trading hub, exporting spices, textiles, and gemstones via the **Silk Road** and **Indian Ocean trade networks** (**Fine Indian muslin** was in great demand in Roman markets).
  - **Cultural Exchange:** Buddhism spread from India to **China, Japan, and Southeast Asia** through trade and travel.
  - **Scientific Contributions:** Indian knowledge, like the **decimal system**, spread globally via **Arab traders.**
- **Colonial Era (18th - 20th Century):**
  - **Economic Reconfiguration:** India was transformed into a supplier of raw materials (e.g., **cotton**) for British industries.
    - **Example***:* Export of **cotton and indigo to Britain** while importing finished goods.
  - **Infrastructure Development:** Railways and ports were developed but served colonial interests.
    - **Example***:* The **Bombay port** became a key trade hub for the British Empire.
- **Post-Independence Protectionism (1947–1991):**
  - **Economic Isolation:** Focus on **self-reliance** under policies like **import substitution** and **five-year plans**.
    - **Example***:* Establishment of **PSUs like BHEL** and **LIC** for economic sovereignty.
  - **Limited Foreign Interaction: Trade and FDI were restricted**; India was largely isolated from global markets.
  - **Challenges:** Inefficient industries, **low growth (termed the "Hindu rate of growth"), and weak exports.**
- **Economic Reforms and Liberalization (1991 Onwards):**
  - **Trigger:** A severe **Balance of Payments Crisis** led to sweeping reforms under the **Narasimha Rao government**, guided by **Manmohan Singh**.
  - **Key Policies:**
    - Reduction in tariffs and trade barriers.
    - Allowing **100% FDI** in certain sectors.
    - Privatization and a shift to market-driven policies.
- **Globalization in the 21st Century (Post-2000):**
  - **Digital Integration:** India emerged as a global **IT outsourcing hub**, providing services to Fortune 500 companies.
  - **Economic Partnerships:** Increased role in multilateral platforms like the **WTO**, **BRICS**, and **G20**.
  - **Cultural Exchange:** Bollywood movies and Indian cuisine gained global recognition. (Films like **Slumdog Millionaire** popularized Indian culture globally).
  - **Start-Up Revolution:** Integration of Indian start-ups like **Ola**, **Flipkart**, and **BYJU's** into the global ecosystem.
- **Post-COVID-19 and Atmanirbhar Bharat:**
  - **Economic Nationalism:** The pandemic exposed supply chain vulnerabilities, leading to a push for self-reliance. (Promotion of local manufacturing under **PLI schemes)**.
  - **Digital Globalization:** Digital platforms like **Unified Payments Interface (UPI)** have revolutionized global fintech systems. (UPI partnerships with countries like **Singapore and UAE)**.

What are the Key Positive Impacts of Globalization on India?

- **Economic Growth and Employment Generation:** Globalization has significantly boosted India's GDP growth by integrating it into global markets, enabling access to **FDI, and expanding export-driven industries like IT and pharmaceuticals.**
  - For instance, India's IT exports reached **$194 billion in FY 2023**, making it the **world's largest IT outsourcing hub**, while FDI inflows hit a record **$83.57 billion in FY 2022**.
  - This has created millions of jobs, particularly in urban centers like Bengaluru and Hyderabad.

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- **Technological Advancement and Innovation:** Globalization has facilitated the influx of cutting-edge technologies, fostering innovation in sectors like space, healthcare, and fintech.
  - **ISRO's expertise and cost-effective launching technologies** have attracted numerous foreign countries. Through its commercial divisions, ISRO has successfully launched around **430 foreign satellites for various nations.**
    - It achieved global acclaim with its **Chandrayaan-3 mission in 2023**, becoming the first country to land near the moon's south pole.
  - Similarly, the adoption of digital payment systems, led by **UPI**, recorded **10.58 billion transactions in September 2023**, showcasing India as a leader in financial technology.
- **Improved Living Standards:** The rise of globalization has elevated the standard of living for millions of Indians, particularly through access to global brands, better healthcare, and higher incomes.
  - While it took 75 years to reach a per capita income of **$2,730,** as per IMF projections**, it will take only five years to add another $2,000.**
  - The strength of the middle class is expected to rise from 432 million people in 2020-21 to **715 million (47%) in 2030-31**
- **Cultural Exchange and Soft Power Enhancement:** Globalization has amplified India's cultural influence globally, promoting its art, cuisine, and traditions while embracing global diversity domestically.
  - Movies like **Slumdog Millionaire, directed by a foreign director with music by A.R. Rahman,** and **RRR**, which **won an Oscar in 2023,** have showcased India's cinematic talent on the world stage.
    - Similarly, the international success of actors like **Irrfan Khan,** who starred in **Spider-Man and Jurassic World,** has further bolstered India's cultural reach.
  - Additionally, the international acceptance of Indian cuisine has boosted tourism.
- **Rise in Entrepreneurship and Start-Up Ecosystem:** Global integration has nurtured India's start-up ecosystem, fostering innovation, funding, and global market access.
  - India became the **third-largest start-up hub globally**.
  - Indian startups raised over **$2.3 billion in the first quarter of 2024** with initiatives like **Start-Up India** boosting entrepreneurial spirit among the youth.
- **Strengthened International Trade and Economic Diplomacy:** Globalization has transformed India into a trade powerhouse, enabling its integration into global supply chains.
  - India's active participation in the **G20 and FTAs (e.g., UAE CEPA in 2022)** has enhanced its **global economic influence and trade competitiveness.**
- **Improved Infrastructure and Urbanization:** Globalization has driven investments in India's infrastructure, modernizing cities and creating smart urban hubs.
  - India is developing **100 Smart Cities**. Metro rail projects in cities like **Delhi and Mumbai**, supported by foreign technology, have enhanced urban mobility.
- **Strengthened Defense and Strategic Capabilities:** Globalization has enabled India to modernize its defense sector through international collaborations, enhancing its strategic standing.
  - The procurement of **Rafale jets** from France. Defence exports touched a record-high of **Rs 21,083 crore in FY 2023-24**
- **Environmental Collaboration and Renewable Energy Growth:** Globalization has fostered India's collaboration in tackling climate change and boosting renewable energy capacity.
  - Initiatives like the **International Solar Alliance (ISA)**, launched in partnership with 121 countries, position India as a leader in sustainable development.
  - India alongside 8 countries **(Argentina, Bangladesh, Brazil, Italy, Mauritius, Singapore, UAE, and USA)**, launched the unique multistakeholder **Global Biofuels Alliance (GBA)** during India's G20 Presidency.

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What are the Key Challenges that Globalization Presents to India?

- **Widening Economic Inequality:** Globalization has accelerated wealth concentration, **benefiting urban elites while leaving rural and marginalized populations behind**.
  - The influx of foreign investments and market liberalization has disproportionately enriched skilled workers and corporations, sidelining unskilled labor.
  - A study reveals India's wealth inequality, with the richest 1% holding 40% of total wealth. The 10,000 wealthiest individuals own 16,763 times the national average, while the top 1% average ₹54 million in wealth.
  - The Gini coefficient, a measure of inequality, climbed to **0.402 in 2022-23,** reflecting deepening disparities.
- **Jobless Growth and Automation:** Despite GDP growth, globalization has fostered **automation and outsourcing,** leading to stagnant job creation in labor-intensive sectors.
  - Industries like **manufacturing and textiles** are increasingly relying on mechanization, displacing unskilled workers.
  - The latest Annual PLFS report estimates the unemployment rate for youth aged 15-29 in India at 10.2% for 2023-24.
- **Decline of Traditional Industries:** Global competition has marginalized India's traditional and small-scale industries, which lack the capital and technology to compete with global giants.
  - **Handicrafts, handlooms, and small-scale industries** are losing relevance as mass-produced imports dominate markets.
  - For example, exports from **India's handloom sector declined by 30%** immediately after Covid-19 pandemic, while millions of artisans faced reduced incomes due to **cheaper machine-made alternatives from China.**
- **Overdependence on Global Supply Chains:** Globalization has made India highly reliant on global supply chains, making it vulnerable to disruptions.
  - The **Covid-19 pandemic** and geopolitical tensions highlighted this dependence, particularly in critical sectors like pharmaceuticals and electronics.
  - For instance, **India relies on China for 70% of active pharmaceutical ingredients (APIs),** while the semiconductor imports in India rose **18.5% to Rs 1.71 lakh crore in 2023-24**
- **Cultural Homogenization:** Global cultural dominance, driven by **media and consumer goods,** has diluted India's indigenous cultural identity and values.
  - **Western food habits, fashion, and media** are increasingly replacing traditional practices, especially among urban youth.
    - For instance, according to a **World Obesity Federation report,** adult obesity in **India has more than tripled,** while the rise in childhood obesity is among the steepest globally, ranking behind only Vietnam and Namibia.
  - Moreover, **regional languages are declining,** with AICTE data revealing that **3 to 4 colleges in West Bengal, Kerala, and Karnataka** have discontinued their engineering courses offered in regional languages.
- **Dependence on Foreign Capital:** India's integration into global financial systems has increased its reliance on **volatile foreign investments,** making its economy susceptible to global shocks.
  - **Capital outflows during global downturns** destabilize markets and depreciate the rupee.
  - India recorded the highest FPI outflow from the equity market in **October 2024, totaling $10,428 million.**
- **Rising Cybersecurity Threats:** Globalization has accelerated **digital adoption,** exposing India to cyberattacks and data breaches due to weak regulations.
  - With an increase in online transactions and data dependence, cybercrimes are on the rise.
  - **In 2023, cyberattacks on India surged by 138%,** targeting critical sectors like **banking and healthcare (AIIMS Delhi Ransomware Attack).**
  - The **CoWIN data leak in 2023** exposed personal details of millions, highlighting the need for stringent data privacy laws.

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- **Loss of Agricultural Autonomy:** Global trade agreements and **corporate-driven globalization** have increased **dependency on imported agricultural inputs and volatile international markets.**
  - The dominance of multinational corporations in agrochemicals and seeds has eroded traditional farming practices. For example, India imported **18.65 lakh tonne urea and 22.58 lakh tonne P&K fertilizers from China** in 2023-24
  - Also, dependence on genetically modified seeds by global giants like **Monsanto has marginalized indigenous seed varieties**, reducing biodiversity and farmers' autonomy.

How India can Balance Globalisation with Push for Self Reliance?

- **Make in India and Make for the World:** The Production Linked Incentive (PLI) scheme should be expanded to emerging sectors like **semiconductors, green energy, and advanced materials.**
  - Encourage MNCs to set up manufacturing units in India while creating strong backward linkages with local MSMEs.
  - This ensures global technology adoption while fostering domestic production and employment.
  - Recent success in smartphone manufacturing under PLI highlights its scalability.
- **Strengthen Research and Development (R&D) Ecosystems:** Invest at least **2% of GDP in R&D to boost innovation**, particularly in frontier technologies such as AI, biotechnology, and quantum computing.
  - Establish **more public-private research parks,** with global collaborations, to commercialize innovations at scale.
  - Initiatives like the **India Semiconductor Mission** need greater momentum with partnerships from tech leaders like **Taiwan**.
  - This ensures global competitiveness without dependency. Linking research to industrial applications can help India move up the value chain.
- **Build Resilient Supply Chains with Regional Partners:** Diversify supply chains by forging deeper economic ties with countries like **Vietnam, Indonesia, and South Korea.**
  - Create **alternatives to China-centric supply chains**, especially in critical sectors like rare earth elements and pharmaceuticals.
  - Participation in **Quad and G20's global value chain initiatives provides** opportunities to balance dependencies. Domestically, invest in port and logistics infrastructure to ensure seamless trade integration.
- **Focus on Skilling for Global Competitiveness:** Develop specialized skill hubs to train the workforce in emerging industries such as **renewable energy, robotics, and logistics.**
  - The Skill India Mission can integrate with global apprenticeship programs through MOUs with developed nations.
  - As remote work grows, **capitalize on India's large IT pool to provide global services.**
  - Facilitate foreign universities arrival in India as envisioned under **National Education Policy 2020**
  - Promoting vocational training in rural areas ensures inclusivity in the global value chain, while also addressing domestic employment challenges.
- **Enhance Agricultural Productivity and Export Competitiveness:** Invest in agri-tech solutions like **precision farming, drones, and blockchain to modernize the agriculture sector.**
  - Promote **export-oriented organic farming** as India's products are frequently rejected due to **sanitary concerns**, which ultimately damages the country's image.
  - Strengthen **India's farm-to-fork supply chains,** integrating them with global export standards.
  - Leveraging recent trade agreements with the **UAE and Australia can expand agricultural exports.**
- **Develop a Green Growth Economy:** Leverage India's G20 presidency commitments to transition to a green economy, emphasizing renewable energy exports.

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- Collaborate with countries like **Germany and Japan** for tech transfer in clean energy. Strengthen domestic green industries to meet global **Environmental, Social, and Governance (ESG) standards, boosting exports.**
- This strategy positions India as both a global leader and a self-reliant green economy.

➢ **Digital Public Infrastructure for Global and Local Synergy:** Scale up platforms like **UPI and ONDC for global adoption,** while enhancing domestic digital inclusion.

- Collaboration with **countries in Africa and Southeast Asia** for digital payment infrastructure builds India's soft power and economic integration.
- Domestically, **ensuring robust data protection laws** through frameworks like the **Digital Personal Data Protection Act 2023** can safeguard sovereignty while enabling seamless global tech partnerships.

➢ **Reform Trade Policies for Strategic Autonomy:** Streamline trade policies to focus on sectors where India has comparative advantages, such as **textiles, pharma, and IT services**.

- Implement **tariff barriers selectively to protect nascent industries** without stifling competition. Boost exports by reducing regulatory hurdles and aligning with global standards.
- The **Regional Comprehensive Economic Partnership (RCEP)** could be reconsidered with protective safeguards for critical sectors to ensure mutual benefits.

➢ **Financial Integration with Domestic Control:** Strengthen global financial participation through **rupee trade settlements with countries like Russia and the UAE.**

- Expand **sovereign green bonds** to attract global investors for developmental projects. Alongside, develop more cities like **GIFT-IFSC in Gujarat.**
- Concurrently, **bolster domestic financial institutions like SIDBI and NABARD** to meet the funding needs of MSMEs.
- This hybrid model ensures robust financial integration while retaining strategic monetary autonomy.

➢ **Focus on Balanced Urban-Rural Growth:** Promote economic decentralization by strengthening **Tier-II and Tier-III cities as manufacturing and innovation hubs.** Integrate these with global markets through initiatives like Smart Cities Mission and AMRUT.

- Enhance rural infrastructure via schemes like **BharatNet** to tap rural entrepreneurship for **global e-commerce platforms.**
- This mitigates regional disparities while balancing globalization with self-reliance.

Conclusion:

India's economic journey, from 2% in 1947 to 7.93% global share in 2023, hinges on balancing **self-reliance with globalization.** While globalization offers opportunities, challenges like **inequality, job losses, and cultural erosion persist.** India must promote domestic manufacturing, **build resilient supply chains, invest in R&D, and focus on skilling to harness global integration.** A balanced approach, prioritizing strategic autonomy and domestic development, is crucial for unlocking India's full potential in the globalized world.

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Path Towards Sustainable Tourism

This editorial is based on "India's path to sustainable tourism" which was published in The Hindu Business Line on 15/12/2024. The article brings into picture the immense economic potential of India's tourism sector, contributing 6.8% to GDP and 9.2% to employment, while emphasizing the need for sustainable practices that balance growth with cultural and environmental preservation.

Tag: GS Paper - 3, Mobilization of Resources, Employment, Inclusive Growth

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India's tourism sector stands at a critical juncture, with immense economic potential **contributing 6.8% to GDP** and employing **9.2% of the workforce**, yet facing significant sustainability challenges. The path forward demands a transformative approach that **prioritizes community ownership, environmental preservation, and authentic experiences.** As the global tourism landscape evolves, India's success lies in balancing **economic growth with cultural integrity, environmental conservation and sustainable tourism.**

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

- **Status:** The tourism sector is witnessing strong **recovery and growth potential** post-pandemic, with domestic tourism leading the way.
  - India is ranked **10th globally in travel and tourism GDP contribution**, and international tourist arrivals are expected to reach **30.5 million by 2028**, reflecting the sector's bright future.
- **Contribution**: The **economic contribution** of the tourism sector in India is significant, with its total contribution to GDP recorded at **US$ 199.6 billion in 2022**, projected to reach **US$ 512 billion by 2028**.
  - The sector is growing annually at **7.1%** and is expected to generate **53 million jobs by 2029**, showcasing its role as a major employment provider.
- **Foreign Tourist Arrivals (FTAs)**: FTAs have shown robust growth, increasing to **9.24 million in 2023**, up from **6.43 million in 2022**.
  - The highest FTAs came from **Bangladesh (24.5%), USA (20.4%), and UK** (6.9%).

What is the Significance of the Tourism Sector for India?

- **Economic Catalyst and Employment Driver:** Tourism directly contributes to economic growth by boosting income and creating jobs across sectors such as hospitality, transport, and retail.
  - It is poised to create approximately 39.5 million jobs by the end of 2024.
  - Foreign Exchange Earnings (FEE) from tourism stood at **US$ 28.1 billion in 2023**, highlighting the sector's role in driving foreign exchange..
- **Cultural Preservation and Global Soft Power:** Tourism ensures the preservation of cultural heritage while projecting India's soft power internationally.
  - Initiatives like Swadesh Darshan have revitalized circuits like the **Ramayana Circuit.**
  - India's **43** UNESCO World Heritage Sites, including the newly added **"Sacred Ensembles of the Hoysalas,"** draw millions of visitors, promoting cultural diplomacy.
- **Infrastructure and Regional Development:** Tourism accelerates infrastructure development, including roads, airports, and connectivity in underdeveloped regions.
  - The UDAN scheme has expanded regional airports to **148 by 2023**, making remote destinations accessible.
  - Jammu & Kashmir **recorded over 2 crore tourists in 2023,** driving regional economic growth and reducing geographic inequalities.
- **Environmental Sustainability through Ecotourism:** Ecotourism aligns tourism growth with environmental conservation, protecting biodiversity and generating sustainable livelihoods.
  - Kaziranga National Park saw revenues of **₹8.8 crore** in 2024, driven by increased ecotourism activity.
  - Programs like **The Travel for** LiFE program encourage **low-impact tourism, fostering harmony between development and ecology.**
- **Healthcare and Wellness Hub:** India's affordable and advanced healthcare system attracts global medical tourists, boosting the wellness tourism sector.
  - The **medical tourism sector reached $9 billion in 2022**, with more than 6,50,000 medical visas issued to international patients in 2022.
  - Initiatives like the **E-Visa and** Ayush Visa **and Ayurveda-based conferences** strengthen India's position as a wellness and medical tourism hub.

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- **Strengthening Diplomacy and Multilateral Engagements:** Tourism bolsters India's global image by showcasing its culture and infrastructure during international events.
  - The G20 Summit in 2023 **hosted by more than 50 cities** highlighted destinations like **Guwahati, Indore, Jodhpur and Khajuraho** boosting global recognition.
  - Events like Pravasi Bharatiya Divas emphasize **India's commitment to leveraging tourism for diplomacy and engagement.**
- **Rural Development and Social Equity:** Tourism reduces rural-urban disparities by fostering income opportunities in remote areas and preserving local traditions.
  - **Kumbalangi, near Kochi**, was declared India's first model tourism. **LadpurKhas** village in the state of **Madhya Pradesh** was selected as the Best Tourism village by the United Nation World Tourism Organisation.
  - Such efforts empower rural communities while safeguarding cultural heritage.
- **Pandemic Recovery and Resilience**: Tourism has been pivotal in India's post-pandemic recovery by revitalizing domestic travel and international arrivals.
  - Domestic tourist visits across India soared to 1,731 million, a sharp rise from 677 million in 2021, reflecting resilience and adaptability.
  - Also, India saw **92 lakh foreign tourist arrivals in 2023 (Economic Survey 2023-24), boosted by campaigns like "Dekho Apna Desh" and G20 initiatives.**
- **Promotion of Startups and Entrepreneurship**: Tourism stimulates **entrepreneurship by creating demand for local services,** from homestays to guided tours, especially in emerging sectors like adventure and ecotourism.
  - The National Tourism Policy 2022 encourages micro-enterprises, providing funding and skill training to rural entrepreneurs.
  - India has over **1,500 tourism startups** offering platforms for travel planning, booking, and facility management.
    - Increased adoption of **cloud solutions** and **SaaS technologies** is further driving innovation and growth.
- **Enhancing India's Global Competitiveness:** Tourism enhances India's global ranking in **ease of doing business by boosting ancillary industries like hospitality and logistics.**
  - India climbed to **39th position among 119 countries** in the 2024 Travel and Tourism Development Index by the World Economic Forum, up from 54th in 2021.
- **Strengthening Urban Revitalization:** Urban tourism drives the revitalization of heritage cities, creating jobs and boosting local economies.
  - **Jaipur's heritage tourism model,** with over 1.5 million annual visitors, illustrates the economic benefits of urban renewal driven by tourism.
- **Contribution to Women's Empowerment**: Tourism provides women with opportunities for employment and entrepreneurship, especially in rural and cultural tourism.
  - For instance, the **handloom industry in Sualkuchi, Assam**, a hub for traditional silk weaving, was integrated into tourism initiatives.
  - **Rajasthan's "Padharo Mhare Desh" campaign has increased the participation of women artisans** in tourism-driven handicraft sales.
- **Boosting Sports and Event Tourism**: India's rise as a global host for sports and events enhances its image and tourism revenue.
  - The **ICC Cricket World Cup 2023** brought **over 1 lakh international fans,** generating **₹11,637 crore in economic activity.**
  - Mega events like the **International Film Festival of India (IFFI) in Goa** highlight India's ability to integrate event tourism into its growth strategy.

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What are the Key Issues Related to India's Tourism Sector?

- **Inconsistent Tourism Infrastructure Development:** India's tourism suffers from inadequate and uneven infrastructure, which fails to meet global standards.
  - **Poor quality roads, lack of high-end accommodations, and inadequate amenities in heritage** and ecotourism sites restrict the sector's potential.
    - For instance, states like **Bihar and Jharkhand**, with **rich cultural and historical significance,** receive a fraction of tourists compared to **Rajasthan**.
  - Rapid infrastructure development can often result in catastrophic consequences, as seen in the case of **Joshimath**.
  - Similarly, **transportation bottlenecks and insurgency issues in the Northeast remain unresolved** despite the region's tourism potential.
- **Environmental Challenges and Over-Tourism:** Popular tourist destinations in India face severe environmental degradation due to **unregulated growth and over-tourism.**
  - For example, **Shimla experienced an acute water crisis in 2018**, attributed to a tourist arrival exceeding its carrying capacity.
  - Similarly, Goa currently generates around **2700 tons per month of non-recyclable waste (plastic waste** constitutes a major part) despite clean-up campaigns, highlighting the lack of sustainable tourism practices.
- **High Dependence on Domestic Tourism**: India's reliance on domestic tourism limits foreign exchange earnings and global competitiveness.
  - Domestic visitor spending in India grew by **15% compared to 2019, reaching ₹14.64 trillion.**
    - However, international visitor spending lagged behind **2019 levels by over 14%,** with ₹0.4 trillion less spent by international tourists last year.
  - This highlights India's heavy dependence on domestic tourism, which reduces its potential for earning foreign exchange and affects its global competitiveness.
- **Safety and Security Concerns**: India's reputation as a tourist-friendly destination is **marred by rising safety issues,** especially for women and solo travelers.
  - NCRB data show that 192 offenses were reported against foreigners **(tourists and residents)** in 2022, with incidents in **Rajasthan and Goa** receiving widespread global attention.
  - Additionally, disasters like the **2023 flash floods in Himachal Pradesh** exposed weaknesses in emergency response systems for tourists.
- **Lack of Skilled Workforce in the Tourism Sector**: The tourism and hospitality sector suffers from a shortage of **skilled professionals,** affecting service quality and India's ability to compete globally.
  - India's tourism and hospitality sector is going to face a **shortfall of over 3.5 million skilled workers,** particularly in areas like hotel management, culinary arts, and travel operations.
- **Insufficient Funding and Policy Fragmentation:** Tourism in India receives inadequate funding and suffers from inconsistent policy implementation.
  - The Indian government gave a boost to the tourism budget recently, but cut down the **global promotion allocation by 97%.**
  - Additionally, the **delay in finalizing the National Tourism Policy**, has led to fragmented efforts at the state and national levels.
- **Cultural Erosion and Loss of Authenticity:** Unregulated tourism often commercializes cultural experiences, eroding their authenticity.
  - For instance, **Jaipur's traditional arts and crafts** are overshadowed by mass-produced souvenirs, with artisans earning only a fraction of the tourism revenue.
  - UNESCO's warnings about **"over-commercialization" of India's heritage cities** further highlight the need for cultural preservation strategies.

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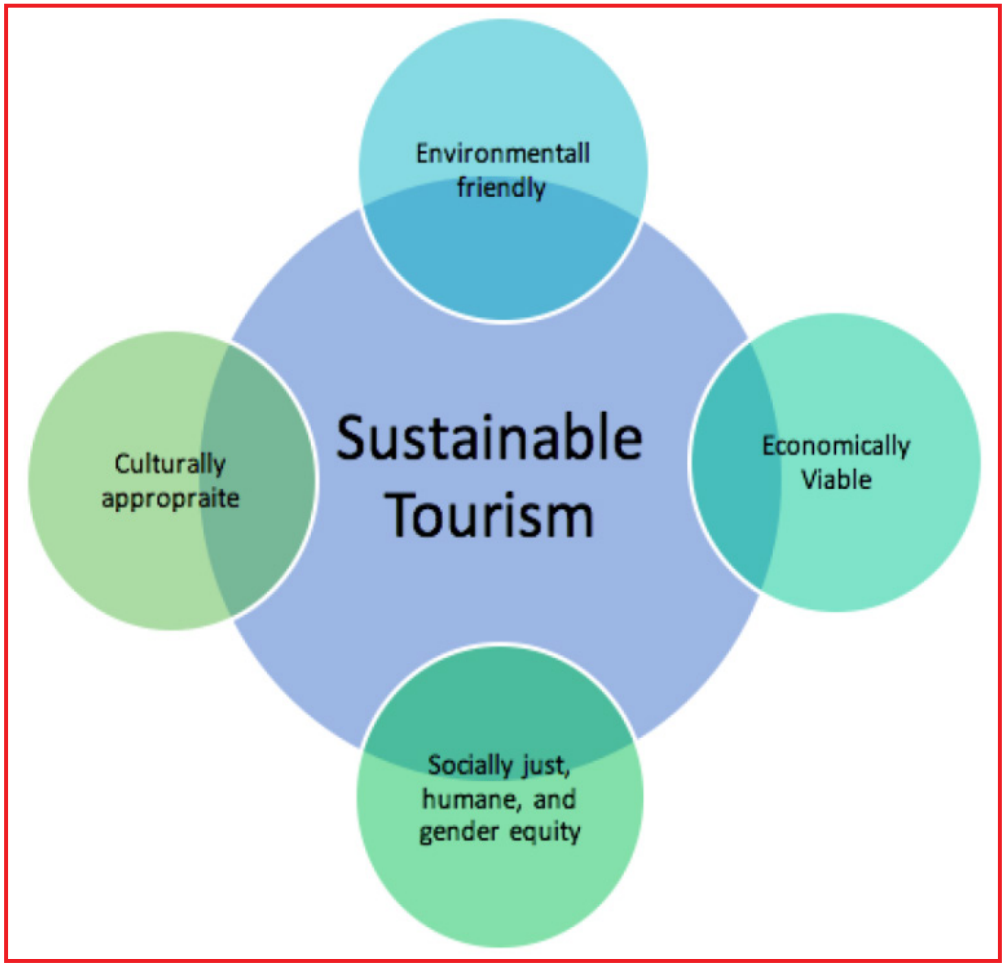
- **Lack of Focus on Digital and Smart Tourism:** India lags in integrating technology and digital tools into tourism management and promotion.
  - While campaigns like **"Incredible India"** incorporate digital marketing, states like **Nagaland and Manipur** lack robust digital ecosystems to attract and manage tourists.
  - Globally, nations like **Singapore are leveraging AI and big data** for tourist engagement, giving them a competitive edge over India.

What Measures can be Adopted to Promote Sustainable Tourism in India?

- **Develop Sustainable Tourism Infrastructure:** India must prioritize **eco-friendly and sustainable infrastructure development,** particularly in ecologically sensitive areas.
  - **Green building practices, solar-powered accommodations, and efficient waste management systems** can reduce the environmental impact of tourism.
  - The **"Swadesh Darshan 2.0"** scheme focuses on destination development with sustainability as a core principle is a step in the right direction.
  - **Expansion of green certifications for tourism establishments** will incentivize environmentally responsible practices.



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- **Promote Community-Based and Rural Tourism:** Integrating local communities into the tourism economy ensures sustainability while preserving cultural heritage.
  - Programs like the Rajasthan Rural Tourism Scheme can be expanded nationwide to promote village-based tourism that supports artisans and local entrepreneurs.
  - For instance, **Gujarat's Hodka village**, which attracts thousands of tourists annually, is a successful model of community-managed tourism.
  - Linking **local crafts to tourism circuits** can create additional revenue streams and reduce urban migration.
- **Encourage Public-Private Partnerships:** Collaborations between the government and private sector can mobilize investments for sustainable tourism projects.
  - PPPs can help in developing **eco-parks, heritage site restorations, and modernizing tourism infrastructure.**
  - For example, the partnership for the **Statue of Unity project in Gujarat** created jobs while **preserving the local environment.**
    - Extending similar models to lesser-known destinations will balance tourism growth across regions.
- **Strengthen Waste Management and Pollution Control:** Tourism hubs must adopt robust **waste management systems and reduce pollution through effective policies.**
  - Initiatives like **plastic-free zones** need to be replicated across all destinations.
  - **Beach tourism** destinations like Goa and Kerala can implement marine pollution control strategies, similar to **Japan's beach cleanup campaigns**.
  - Government-led awareness campaigns under **Mission LiFE (Lifestyle for Environment)** can educate tourists on sustainable travel behavior.

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- **Leverage Technology for Smart Tourism:** India should use technology for sustainable tourism through **smart ticketing systems, AI-driven crowd management, and virtual tourism experiences.**
  - For example**, QR codes at heritage sites like the Taj Mahal** reduce paper waste and enhance visitor experiences.
  - Platforms like **Incredible India,** integrating AR/VR technologies, can promote virtual tourism to attract more tourists to India**.**
- **Integrate Renewable Energy Solutions:** Tourism establishments, particularly in remote and eco-sensitive areas, should adopt renewable energy sources to minimize their carbon footprint.
  - **Solar energy-based lodges in Ladakh** serve as successful examples of sustainable tourism.
  - Expanding subsidies under the **Solar Charkha Mission** to include tourism-linked businesses can drive this transition.
  - Incentivizing **carbon-neutral operations through tax rebates** can further encourage renewable energy adoption.
- **Implement Capacity Management at Popular Destinations:** Carrying capacity studies should guide the regulation of tourist numbers in fragile ecosystems and overcrowded destinations.
  - For instance, **Shimla and Manali,** which face over-tourism issues, can limit daily tourist inflows using online permits, as seen in **Bhutan's sustainable tourism model.**
  - Establishing such mechanisms ensures that **natural resources and infrastructure are not overwhelmed,** preserving these destinations for future generations.
- **Develop Low-Impact Transport Networks:** Promoting sustainable transport options, such as electric buses and bicycles, can reduce the carbon footprint of tourism.
  - Initiatives like **Kerala's "e-Mobility" program,** which introduced electric boats in backwaters, can be expanded to other tourist hotspots.
  - Extending the reach of the **Regional Connectivity Scheme (UDAN)** with eco-friendly aviation practices will also contribute to low-impact tourism.
    - Integrating these measures can align with **India's 2070 net-zero carbon target.**
- **Establish Green Tourism Zones**: Identifying and designating specific areas as **Green Tourism Zones** can ensure sustainable practices and resource conservation.
  - States like **Uttarakhand** have pioneered such initiatives, **promoting eco-tourism** while safeguarding fragile ecosystems.
  - Linking these zones to **Swadesh Darshan and the Pilgrimage Rejuvenation and Spiritual Augmentation Drive scheme** can attract eco-conscious travelers.
- **Preserve Cultural Heritage and Traditional Practices:** Sustainable tourism must involve the preservation of India's cultural and historical heritage.
  - **Local cultural festivals can be integrated into tourism circuits,** emphasizing authenticity.
  - Also more tourism circuits like **Ramayana Circuits** can be developed to promote cultural tourism.
- **Foster Global Partnerships for Best Practices:** India should collaborate with countries excelling in sustainable tourism, such as **Bhutan and Costa Rica**, to adopt proven models.
  - **Bhutan's high-value, low-impact tourism model,** which charges sustainable development fees, can be adapted to certain Indian destinations.
  - Additionally, India can engage with international organizations like the **UNWTO (United Nations World Tourism Organization)** for technical support.

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- Joint ventures in tourism development zones can promote knowledge exchange and innovation.

- **Promote Adventure and Wellness Tourism Responsibly:** Adventure and wellness tourism should be developed with sustainability at the core.
  - Adventure tourism circuits like **Andaman and Nicobar Islands** can be developed by learning from Maldives.
  - Regulating trekking and camping in eco-sensitive areas like **Himachal Pradesh and Uttarakhand** through permits and waste management norms is critical.
  - For wellness tourism, **linking Ayurvedic resorts to initiatives like the International Year of Millets 2023** can promote organic and sustainable practices.
  - Establishing **stricter quality standards for medical and wellness tourism** will attract more global travelers.

Conclusion:

India's tourism sector can drive sustainable growth by aligning with key Sustainable Development Goals (SDGs) such as **decent work (SDG 8), environmental sustainability (SDG 13 & SDG 12), and cultural preservation (SDG 11 & SDG 16).** By fostering inclusive and responsible tourism, India can create jobs, protect its environment, and promote cultural heritage. This approach can position **India as a leader in sustainable tourism worldwide**.

■■■

Towards Unified ESG Framework for India

This editorial is based on "Lack of regulatory clarity could drive away private ESG finance for India" which was published in Business Standard on 16/12/2024. The article brings into picture the global shift in ESG investing, highlighting the $24 billion outflow from green funds in 2024 due to political resistance in the U.S. and India's missed opportunities caused by regulatory delays. It emphasizes the urgent need for India to adopt clear and harmonized ESG frameworks to attract sustainable investments.

Tag: GS Paper - 2, Government Policies & Interventions, GS Paper - 3, Growth & Development, Conservation, Environmental Pollution & Degradation

The global landscape of **Environmental, Social, and Governance (ESG)** reporting is undergoing a significant transformation, with nearly **$24 billion exiting green-focused funds in 2024.** In the United States, political polarization and resistance from conservative states have contributed to a **cooling of ESG enthusiasm**. India stands at a critical juncture, having missed **potential billions in sustainable investment** due to bureaucratic delays and a lack of clear regulatory frameworks. As the global investment climate becomes more challenging, India must act swiftly to **develop comprehensive, interoperable ESG regulations** to remain competitive in the sustainable investment market.

What is ESG Reporting?

- **About**: **Environmental, Social, and Governance** is a critical framework for evaluating a company's sustainability and ethical performance across three key areas:
  - Environmental Impact
  - Social Responsibility
  - Corporate Governance
- Amid escalating global environmental and social challenges, **investors** and **stakeholders** increasingly demand businesses adopt responsible practices.
  - Strong ESG performance has become essential for long-term business success, risk mitigation, and enhanced investor confidence.

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How ESG Regulations Evolved in India?

- **2009:** The Ministry of Corporate Affairs (MCA) issues the *"***Voluntary Guidelines on Corporate Social Responsibility".**
- **2011:** MCA introduces the **"National Voluntary Guidelines (NVGs) on Social, Environmental, and Economic Responsibilities of Business"**, offering a structured framework for reporting.
- **2012:** The Securities and Exchange Board of India (SEBI) mandates the **top 100 listed companies** (by market capitalization) to file the **Business Responsibility Report (BRR).**
  - The BRR requirement is expanded to include the **top 500 listed companies** in 2016.
- **2019:** MCA updates the NVGs, renaming them as the *"***National Guidelines for Responsible Business Conduct (NGRBC)".**
- **2021:** SEBI introduces the Business Responsibility and Sustainability Reporting (BRSR) framework:
  - **Voluntary** adoption for the top 1000 companies.
  - Becomes **mandatory** from FY 2023.
- **2023:** SEBI launches **BRSR Core**, applicable to the **top 150 listed companies** (by market capitalization) starting FY 2024.

Why Robust Environmental, Social, and Governance Framework are Crucial for India?

- **Climate Crisis and India's Vulnerability:** India is the **7th most vulnerable country to climate change (**Global Climate Risk Index 2019**)**, with severe floods, droughts, and heatwaves disrupting lives and GDP growth.
  - India suffered an income loss of **$159 billion, 5.4% of its gross domestic product,** in the service, manufacturing, agriculture, and construction sectors due to extreme heat in 2021.
  - Integrating **ESG principles ensures robust adaptation and mitigation strategies.**

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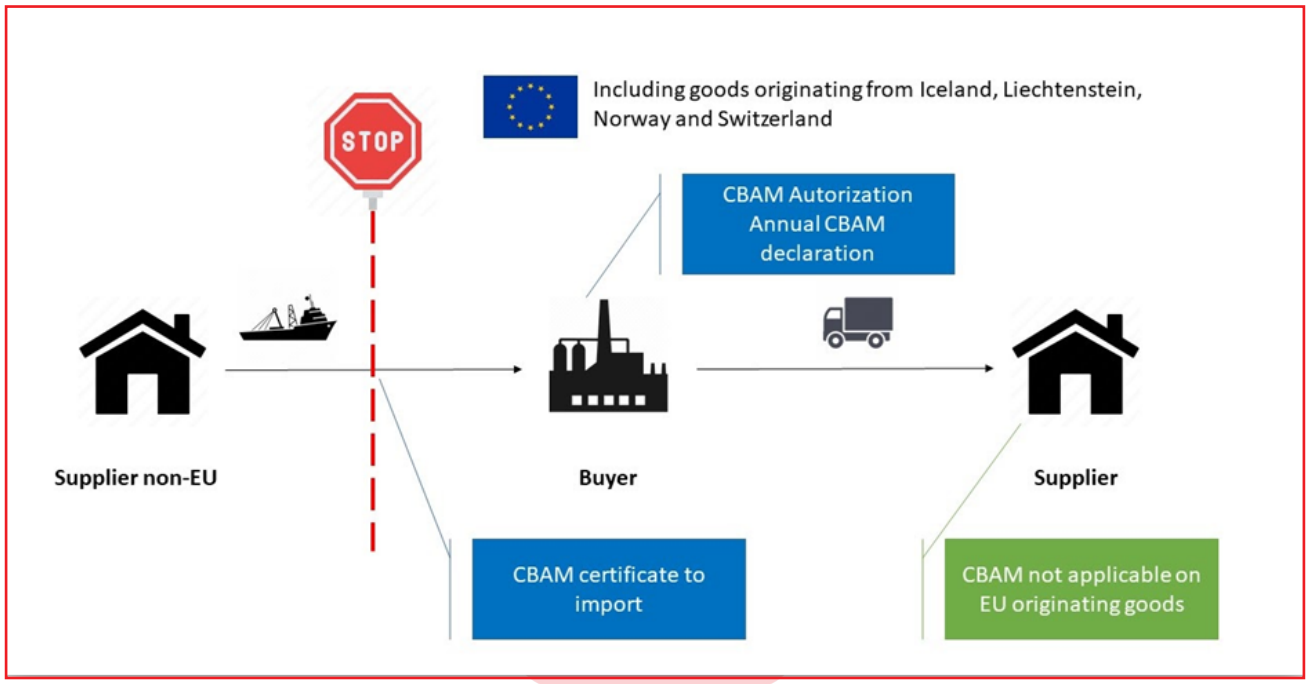
- **Global Competitiveness and Trade Standards:** India's export industries face increasing pressure to align with **ESG requirements as global markets,** like the **EU Carbon Border Adjustment Mechanism (CBAM)**, demand sustainable practices.
  - The CBAM will come into effect from **1st January, 2026** for 7 **carbon-intensive sectors,** including **steel, cement, fertiliser, aluminium and hydrocarbon products.**
  - India's **26.6% of exports of iron ore pellets, iron, steel, and aluminium** products go to the EU. These products will be hit by CBAM. Failure to adopt ESG would be a serious concern for India.



- **Economic Growth and Sustainable Development:** India's economic ambition of becoming a **$5 trillion economy hinges on sustainable growth.**
  - ESG adoption in sectors like **manufacturing, energy, and real estate** ensures resource efficiency and long-term development.
  - Companies investing in **ESG frameworks**, like **Adani Green**, saw a **30% rise in clean energy production in FY24,** aligning profits with sustainability goals.
- **Energy Security and Green Transition:** India's heavy **fossil fuel import** dependency **(85% of oil and 50% of natural gas)** strains the economy and increases carbon emissions.
  - In **2023**, India became the **world's third-largest solar power generator**, surpassing **Japan**. Solar energy contributed **5.5% globally**, with India's production increasing significantly.
  - ESG accelerates the shift to **renewable energy,** enhancing energy security and job creation.
- **Job Creation and Green Employment:** Transitioning to **ESG-driven sectors** creates millions of jobs in **clean energy, waste management, and sustainable industries.**
  - India's transition to a green economy could contribute more than $1 trillion in economic impact by 2030, as well as create over **50 million jobs.**
  - For example, the **National Green Hydrogen Mission is alone set to create 6 lakh jobs,** while EV manufacturing under the **FAME II scheme** promised 10 million direct and indirect jobs by 2030.

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- **Air and Water Quality Improvement:** India's cities face severe air pollution, impacting health, productivity, and life expectancy.
  - For example, **Delhi's AQI touched 400+ levels** frequently in 2024. **More than half of the rivers in India** are highly polluted with numerous others at levels considered unsafe by modern standards
  - ESG adoption promotes **clean energy, efficient industries, and better waste management,** which would ultimately lead to the reduction of pollution.
- **Corporate Governance and Risk Mitigation:** Strong governance under **ESG** ensures transparency, ethical business practices, and stakeholder trust.
  - Companies with sound governance have better stock performance and reduced risks.
  - For instance, **SEBI's Business Responsibility and Sustainability Reporting (BRSR)** for top 1,000 companies improved corporate ESG disclosures, benefiting companies like **Infosys**.
- **Waste Management and Circular Economy:** According to a report by **Energy and Resources Institute (TERI),** India generates over **62 million tons (MT)** of waste in a year.
  - Only **43 MT** of total waste generated gets collected, with **12 MT being treated before disposal,** and the remaining 31 MT simply discarded in wasteyards.
  - ESG focuses on **circular economy principles to minimize waste and maximize recycling.**
  - Companies like **Hindustan Unilever are now plastic neutral**, recycling more plastic than they produce, aligning with the **Extended Producer Responsibility (EPR) norms.**
- **Healthcare and Social Development:** ESG emphasizes the social component, driving investments in **healthcare, education, and community development**, critical for India's demographic dividend.
  - For example, **India's health expenditure increased to 2.1% of GDP in FY23,** but about **68% of India's population still lives in rural areas**, yet healthcare infrastructures in these areas are in pathetic condition, **requiring further ESG interventions.**
- **Investor Sentiments and Sustainable Finance:** Global investors increasingly favor **ESG-compliant markets,** and India needs sustainable finance to fund infrastructure and growth.
  - As of now, India is the **6th largest issuer of GSS+ (Green, social, sustainability and sustainability-linked) bonds in the Asia Pacific region**, with green bonds constituting more than **62% of overall GSS + bonds** issued in India, that demonstrate strong investor confidence in sustainable growth.

What are the Challenges Hindering Effective ESG Implementation in India?

- **Lack of Regulatory Clarity and Enforcement:** India's ESG framework lacks a **unified, legally binding structure, and enforcement mechanisms** are weak, especially for **small and medium enterprises (SMEs).**
  - Companies often view **ESG as compliance rather than strategic change,** leading to superficial adoption.
  - For instance, **despite SEBI's BRSR mandate for top 1,000 firms,** many of listed SMEs struggle with ESG reporting.
- **High Cost of ESG Adoption and Limited Capital:** Transitioning to sustainable practices requires significant **financial investments,** making it infeasible for **cash-strapped industries**, particularly in energy-intensive sectors like MSMEs.
  - Lack of access to **affordable green finance** further exacerbates this issue. For example, ESG-related costs for industries like cement and steel can increase by **25-75%** (for green cement and green steel).
- **Insufficient Awareness and ESG Skill Gaps:** There is a lack of awareness and expertise among industries and investors, **especially in Tier-2 and Tier-3 regions,** where knowledge about ESG frameworks is minimal.
  - India's workforce also lacks technical skills to implement ESG strategies effectively.
  - Currently, the top 1,000 listed companies alone require around **5,000 mid-to-senior ESG experts** and potentially 100,000 additional professionals for junior teams, auditors, and partners.
    - With nearly **7,000 listed entities as of 2022** and a projected **10,000 by 2032,** India will need over 1 million ESG-ready professionals.

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- **Weak Infrastructure for Renewable Energy Transition:** India's ambitious energy transition goals are **hampered by poor infrastructure, grid limitations, and inconsistent policies**, especially in rural and industrial belts.
  - Industries find it challenging to rely on renewables for steady power supply.
  - Despite India's **renewable capacity reaching 203 GW (October, 2024),** transmission losses remain at **15-17%**, and rural areas lack access to clean, affordable energy.
- **Balancing Economic Growth with ESG Goals:** India's developmental priorities, like **industrialization and job creation, sometimes clash with ESG objectives.**
  - Industries often prioritize profits and short-term growth over sustainability, slowing down ESG adoption.
  - For instance, **coal continues to contribute 50% of India's energy needs,** with **new thermal plants being approved (like Amarkantak Thermal Power Station)** to meet energy demand despite climate concerns.
- **Resistance from Traditional Industries:** Industries like **steel, cement, textiles, and mining,** which form India's economic backbone, face significant resistance to adopting ESG due to **outdated processes and profit-driven models.**
  - Transitioning to clean practices threatens competitiveness and profitability. For instance, the **cement sector contributes 8% of global CO_2 emissions,** but switching to alternative energy sources increases production costs.
- **Social Inequality and Poor Workforce Conditions:** India struggles with deep socio-economic inequality, where **ESG implementation in labor practices is often overlooked.** Millions of workers in informal sectors lack access to fair wages, healthcare, and safety norms.
  - For example**, 90% of India's workforce remains in the unorganized sector**, and sectors like construction still report significant workplace safety violations.
- **Environmental Policy Gaps and Delayed Implementation:** Despite progressive policies, India faces delays and inconsistencies in implementing environmental regulations due to bureaucratic hurdles and weak monitoring.
  - Projects often bypass **environmental impact assessments (EIAs) like 2020 Vizag Gas Leak in Visakhapatnam, Andhra Pradesh,** underscoring the urgent need for stricter enforcement, timely clearances, and robust accountability mechanisms.
- **Investor Reluctance and ESG Misalignment:** Indian investors often prioritize **short-term financial returns,** viewing ESG as secondary to profits.
  - The study revealed that **80%** of Indian investors have adopted sustainability policies, with **only 14% implementing them for over 5 years** and **58% for more than 2 years.**
  - There is also a lack of alignment in measuring ESG performance against financial outcomes.

What can India Learn from other Countries Regarding ESG?

- **Adopting Stringent ESG Regulations- EU's Green Deal:** The **European Union's Green Deal and Carbon Border Adjustment Mechanism (CBAM)** ensure strict accountability, incentivizing companies to prioritize sustainability and innovation.
  - India can learn to implement binding regulations and penalties for non-compliance to prevent greenwashing.
- **Promoting Green Finance – Germany's Sustainability Bonds:** Germany leads in green finance with bonds like **green "twin bonds" ,** attracting massive investment for renewable energy and infrastructure projects.
- **Transparent ESG Reporting – Japan's Disclosure Standards:** Japan mandates clear, standardized ESG disclosures under its **Corporate Governance Code**, improving investor trust and corporate accountability.
- **Skill Development for ESG Transition – Denmark's Workforce Model**: Denmark focuses on skill development for a **green workforce,** offering training programs to transition workers into sustainable industries like wind energy.
- **Decentralized Renewable Projects – Africa's Community Solar Grids:** Countries in Africa are implementing decentralized solar grids, ensuring energy access for rural communities and reducing energy poverty.
  - India can replicate decentralized renewable models to power its remote regions sustainably.

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What Measures can India Adopt to Enhance the ESG Framework?

- **Create a Robust and Unified ESG Framework:** India should design a **comprehensive, unified regulatory framework** applicable across all sectors, including MSMEs, to ensure consistent ESG implementation.
  - This framework must **define sector-specific ESG goals,** clear reporting guidelines, mandatory disclosures, and penalties for non-compliance.
  - Additionally, **a single oversight body like an ESG Regulatory Authority** can streamline enforcement and provide industry-specific guidance to prevent ambiguity.
- **Scale Up Green Financing Initiatives:** To enable smooth ESG adoption, India must **prioritize scaling up green financing** through mechanisms like sovereign green bonds, ESG-linked loans, and dedicated green finance institutions.
  - **Tax incentives, low-interest loans, and subsidies** for ESG-compliant businesses will attract investors and industries to transition sustainably.
  - Collaborations with private financial institutions to create **Green Transition Funds** can further ease access to capital for MSMEs and large industries alike.
- **Promote Adoption of Circular Economy Models:** India must **move towards a circular economy** by promoting sustainable production, resource efficiency, and waste minimization.
  - Initiatives like **Extended Producer Responsibility (EPR)** for industries such as plastic, electronics, and automobiles should be rigorously enforced.
  - Furthermore, **incentivizing waste-to-energy projects**, recycling ecosystems, and re-manufacturing industries can help reduce landfill pressure and improve resource sustainability.
- **Strengthen ESG-Linked Public-Private Partnerships:** India should enhance **Public-Private Partnerships to accelerate ESG-related projects** in sectors like renewable energy, urban infrastructure, and environmental conservation.
  - Government schemes like the **Production-Linked Incentive (PLI)** can include ESG components to attract private sector participation in cleaner production.
  - These partnerships can **prioritize investments in large-scale solar and wind farms, green urban transport,** and carbon-neutral industrial hubs.
- **Implement Carbon Pricing and Taxation Policies:** India must adopt a carbon pricing mechanism, including **carbon taxes or an emissions trading system**, to hold industries accountable for their **carbon footprint** while incentivizing greener alternatives.
  - Revenue generated from carbon taxes can be **reinvested into clean energy infrastructure and technology.**
  - Linking carbon pricing with existing programs like the **Perform, Achieve, Trade (PAT) scheme** can ensure sector-wide accountability.
- **Build ESG Awareness and Industry Capacity:** India needs to **roll out extensive ESG awareness programs** and skill-building initiatives to empower industries, particularly MSMEs and rural sectors.
  - Including ESG-specific training modules under existing programs like **Skill India 2.0** will create a workforce equipped with the skills needed for green jobs.
  - Capacity-building programs must also **target industry leaders to educate them about the economic and social benefits** of ESG adoption.
- **Modernize Energy Infrastructure for Renewable Transition:** India must invest in upgrading its energy infrastructure to ensure the **integration of renewable energy at scale.**
  - This includes modernizing t**ransmission grids, expanding energy storage solutions like batteries,** and creating micro-grid systems for rural areas.
  - Initiatives like the **National Green Hydrogen Mission** must be scaled with supporting infrastructure to accelerate the shift to cleaner fuels.
  - Tata Steel aims to achieve **100% material efficiency across all steelmaking sites by FY30, and can serve as a model.**
- **Ensure Mandatory ESG Reporting and Third-Party Audits:** India should **make ESG disclosures mandatory for all listed companies and large industries,** accompanied by third-party audits to ensure credibility and prevent greenwashing.

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- Standardizing reporting through tools like the **Business Responsibility and Sustainability Reporting (BRSR)** can be made more accessible for SMEs.
- Introducing a **national ESG Ratings System** will encourage businesses to improve their performance.

➢ **Incentivize Adoption of Renewable Energy and Cleaner Technologies:** The government should provide targeted incentives like **tax breaks, subsidies, and technology-sharing initiatives** to accelerate the adoption of renewable energy and cleaner industrial technologies.

- Policies promoting **green hydrogen, energy-efficient machinery, and EV infrastructure** should be strengthened.
- Expanding schemes like the **Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME)** will further bolster sustainable transitions.

➢ **Promote Social Equity Through Labor Welfare Programs:** India must prioritize the social dimension of ESG by strengthening **labor laws, addressing workplace safety, and promoting inclusivity.**

- Programs to **close wage gaps (through effective implementation of Labour Codes), provide health benefits, and ensure diversity** (especially for women and marginalized groups) are critical.
- **Linking corporate incentives to social impact metrics,** such as gender diversity and fair wages, can create a more equitable workforce.

➢ **Leverage Technology for ESG Monitoring and Implementation:** India can adopt advanced technologies like **AI, IoT, and blockchain to monitor ESG compliance** in real time, track carbon emissions, and measure sustainability performance.

- Creating a **centralized ESG Data Repository** will help industries, investors, and regulators access reliable data for decision-making.
- **Technology-driven monitoring tools** can also ensure effective enforcement of ESG standards.

➢ **Integrate ESG into Government Procurement Policies:** The government should **adopt ESG criteria in procurement processes,** ensuring that contracts are awarded to businesses with strong ESG compliance.

- Linking government funding to ESG performance will drive industries toward sustainability.
- For instance, introducing **Green Procurement Guidelines can make ESG compliance mandatory** for public infrastructure projects.

➢ **Focus on Urban Sustainability Through Smart Cities:** India must integrate ESG principles into **urban development projects** under programs like the **Smart Cities Mission.**

- Emphasis should be placed on **green buildings, sustainable urban transport, and water-efficient systems.**
- Developing **carbon-neutral urban zones** can be a model for future cities, aligning with India's net-zero targets.

Conclusion:

India must adopt a forward-looking approach to strengthen its ESG regulatory framework, **ensuring clarity and consistency in policies to attract sustainable investments**. This involves **streamlining regulations, reducing adoption costs, and investing in necessary infrastructure.** Emphasizing innovation and partnerships with global leaders will enable India to build a competitive edge in the ESG space. By proactively addressing these challenges, India **can position itself as a key player in the global sustainable investment landscape.**

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AI and India's Legal Landscape

This editorial is based on "The legal gaps in India's unregulated AI surveillance" which was published in The Hindu on 18/12/2024. The article brings into picture the rapid expansion of AI-driven surveillance in India, including facial recognition, amid weak legal safeguards. It highlights how the Digital Personal Data Protection Act (2023) grants broad government exemptions, leaving citizens vulnerable to unchecked data collection and privacy risks, unlike the EU's risk-based approach.

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

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India is rapidly expanding **AI-powered surveillance infrastructure**, deploying **facial recognition systems and Artificial Intelligence technologies** across law enforcement without comprehensive legal safeguards. The current regulatory landscape, exemplified by the **Digital Personal Data Protection Act of 2023,** grants broad government exemptions that potentially compromise individual privacy rights. Unlike the **European Union**'s risk-based approach to AI regulation, **India lacks clear legislative frameworks to govern these technologies,** leaving citizens vulnerable to unchecked data collection and potential civil liberties infringements.

How Artificial Intelligence is Currently Regulated in India?

- **Information Technology Act of 2000**: It provides legal recognition for electronic transactions and includes rules to protect electronic data, information, and records from unauthorized or unlawful use.
  - **IT Act 2000,** along with the Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules of 2011.
  - These are set to be replaced by the **Digital India Act 2023,** which is currently in draft form and is expected to include key provisions related to AI.
  - **Information Technology (Intermediary Guidelines and Digital Media Ethics Code), 2021** provides a framework for oversight of social media, OTT platforms, and digital news media.
- **Government Advisories on AI and Large Language Models (March 2024):** Significant platforms must obtain MeitY approval **before deploying untested AI models to prevent bias**, electoral interference, or unidentifiable AI-generated media.
  - Exemptions apply to startups and smaller platforms.
  - Revised guidelines shift focus to **mandatory labeling of unreliable AI models**, user notifications for content inaccuracies, and **deep fake detection measures.**
- **Digital Personal Data Protection Act (DPDP), 2023** is the primary law regulating data collection, storage, and processing.
  - **Limitations:** Lacks provisions specific to AI-related challenges like algorithmic biases or AI-generated data misuse.
    - **No explicit mechanisms for AI audit or accountability**,
- **Principles for Responsible AI (2021):** Seven core principles: **Safety and reliability, inclusivity, non-discrimination, privacy, transparency, accountability, and reinforcement of positive human values.**
  - Collaboration encouraged between the government, private sector, and research entities.
- **National Artificial Intelligence Strategy (2018):** Launched by NITI Aayog under the tagline **#AIFORALL**.
  - **Focus areas**: Healthcare, education, agriculture, smart cities, and transportation.
  - **Recommendations implemented:** High-quality dataset creation and legislative frameworks for data protection and cybersecurity
  - It serves as a foundational document for future AI regulation in the country.
- **Draft National Data Governance Framework Policy (2022):** Modernizes government data collection and management.
  - Aims to support AI-driven research and startups through a comprehensive dataset repository.

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How AI Technologies Can Strengthen India's Legal Landscape?

- **Timely and Effective Delivery of Justice:** AI can streamline **case management by automating repetitive tasks** like documentation, case categorization, and scheduling.
  - With over **5 crore pending cases** in Indian courts, AI-driven tools can **expedite processes,** freeing up judges to focus on substantive matters.
    - AI can also analyse legal precedents and case laws, **offering historical data that aids in informed decision-making** and litigation strategy development.
  - AI can assist in **evidence collection, verification, and analysis,** especially in complex cases involving large datasets, forensic evidence, or digital fraud.
    - The **National Forensic Sciences University** in Gujarat is integrating AI to analyze **digital evidence,** expediting cybercrime investigations.
    - **The Tis Hazari District Court in Delhi** introduced its first AI-equipped 'Pilot Hybrid Court' featuring a speech-to-text facility.
  - AI-powered platforms can simplify **mediation and arbitration processes** by automating communication and negotiation tracking.
    - Platforms like **ODR India use AI to facilitate online dispute resolution**.
- **Enhancing Legislative Processes:** AI can assist lawmakers in **drafting, analyzing, and amending legislation** by processing vast amounts of legal and public policy data.
  - AI-driven simulations can predict the **social, economic, and environmental impact of proposed laws,** enhancing their precision and relevance.
    - For instance, in some countries, tools like the **European Union's Legislation Editing Open Software (LEOS)** are enhanced with AI.
  - AI-powered legal tools **now make it easier for people who aren't lawyers to communicate with lawyers**: they could speed up processes and cut down on the time needed for legal research and compliance analysis.
- **Improved Law Enforcement and Crime Prevention:** AI can enhance the efficiency of law enforcement by enabling predictive policing, real-time crime monitoring, and evidence analysis.
  - Recently, **Delhi Police used artificial intelligence (AI) to reconstruct the face of an unidentified murder victim** and employed the image on a poster to seek information about his identity.
    - The novel approach not only **led to the victim's identification** but also played a crucial role in apprehending the perpetrators.
- **Facilitating Compliance with International Laws:** AI can simplify compliance for multinational corporations operating in India by analyzing **cross-border regulations and trade laws.**
  - Automated compliance tools **reduce the risk of penalties** and improve India's ease-of-doing-business ranking.
  - Companies like **TCS and Infosys** are developing **AI compliance tools** for international trade agreements.
- **Strengthening Corporate Compliance:** AI simplifies legal compliance by **automating monitoring, reporting, and filing processes,** especially for businesses operating across multiple jurisdictions.
  - With India's growing emphasis on **ESG (Environmental, Social, and Governance) reporting,** AI ensures timely compliance and prevents violations.
  - Companies can use AI for compliance with **SEBI's ESG disclosure norms**, reducing manual errors.
- **Improving Consumer Protection Mechanisms:** AI can process consumer complaints, monitor fraudulent activities, and **predict market trends** to enhance consumer safety.
  - With **growing e-commerce and digital platforms,** AI enables authorities to address grievances efficiently and prevent fraud.
  - The **Consumer Protection Authority of India** can use AI to track unfair trade practices..
- **Facilitating Environmental Law Enforcement:** AI can monitor environmental compliance by analyzing data from **sensors, satellites, and field reports, ensuring adherence to regulations.**

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- AI tools help identify violations such as illegal mining or deforestation, enabling swift regulatory action.
- In just 4 months, the **Karnataka Forest Department** has identified **167 cases of encroachment** with the help of AI-powered analysis and satellite imagery.

➢ **Strengthening Intellectual Property Rights:** AI tools can streamline IPR processes by assisting in patent searches, drafting, and detecting copyright infringement.

- By **automating complex searches and filings**, AI ensures faster approvals and reduces disputes in IP-intensive industries like pharmaceuticals and IT.
- With advancements in AI, the **U.S. Patent and Trademark Office (USPTO)** has seen a rise in patent applications for AI-assisted inventions, which can be replicated in India.

How Are AI Technologies Challenging India's Legal Framework?

➢ **Privacy and Data Protection Vulnerabilities:** AI systems extensively **collect, analyze, and monetize personal data,** often without adequate safeguards, threatening citizens' privacy rights.

- The **Digital Personal Data Protection Act (2023)** is a step forward but **lacks stringent enforcement mechanisms**, especially regarding AI-driven surveillance.
- Facial recognition technology **(FRT)** is extensively utilized in public spaces, such as its deployment by **Hyderabad's police** under the **Smart Policing Mission,** raising concerns of mass surveillance.
- India ranked **second globally** in cyberattacks (PwC 2022), with **40% of Indian firms using AI lacking proper data security protocols** (NASSCOM, 2023).

➢ **Bias and Discrimination in Algorithmic Decision-Making:** AI systems often reinforce **societal biases due to flawed datasets**, leading to discriminatory outcomes in hiring, lending, and policing.

- Without comprehensive guidelines for algorithmic fairness, **AI perpetuates systemic inequalities,** undermining constitutional principles of equality.
- AI-powered recruitment tools in India were reported to filter out female candidates disproportionately in tech roles.`
  - In 2018, **Amazon discontinued its secret AI recruiting engine** due to biases against women, yet **similar systems could still be in operation across India.**

➢ **Intellectual Property Conflicts:** AI challenges the foundational principles of IP law by blurring the lines of ownership in AI-generated works.

- India's copyright framework **lacks clarity on AI-generated content,** leaving creators vulnerable to exploitation.
  - The **Copyright Act of 1957** stipulates that a work is eligible for copyright only if it is original and the result of human authorship. Therefore, **AI-generated content is not considered copyrightable.**
- **Andersen v. Stability AI Ltd. case** highlights artists' vulnerabilities amid unclear copyright protections.

➢ **Economic Inequality and Labor Law Challenges:** AI-driven automation risks **exacerbating unemployment and economic disparity,** challenging India's labor protections.

- India's labor laws, **including** Four Labour Codes, do not address job displacement caused by AI.
- According to a **McKinsey Global Institute report**, automation could potentially displace up to **60 million workers** in India's manufacturing sector by 2030, with industries like textiles and electronics being particularly affected.

➢ **National Security Threats:** AI's misuse in cyberattacks, deep fakes, and misinformation campaigns threatens India's internal security.

- During the Lok Sabha Elections 2024**, deep-fake videos were used to spread misinformation**, undermining electoral integrity.
- In 2023, India faced a surge in cyber attack incidents, experiencing a **15% increase in weekly attacks per organization** compared to 2022.
- **India lacks AI-specific cybersecurity regulations,** leaving critical sectors like banking and defense exposed.

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- **Ethical and Accountability Concerns:** AI applications in **healthcare, law enforcement, and public services** raise questions about ethical standards and liability.
  - Errors by AI systems lack clear accountability frameworks, leading to legal vacuums in disputes.
  - A recent study published in JAMA examines the impact of systematically biased artificial intelligence (AI) on clinicians' diagnostic accuracy.
    - The findings reveal that predictions from **biased AI models reduced clinicians' accuracy by 11.3%** points compared to baseline levels.
- **Environmental Impacts of AI Deployment:** The **energy-intensive nature of AI training** models exacerbates India's environmental challenges, including rising carbon emissions.
  - Training a large language model like **ChatGPT-3** demands substantial energy, consuming as much as **10 gigawatt-hours (GWh) of electricity.**
  - India's legal framework lacks mandates for **sustainable AI practices,** contradicting its climate commitments.

What Steps can be Taken to Strengthen AI Regulation and Ensure Responsible AI Usage in India?

- **Enact a Comprehensive AI-Specific Legislation:** India needs a dedicated law that addresses **AI-related challenges, including ethical guidelines, accountability mechanisms, and risk classification.**
  - The **European Union's AI Act (entered into force in 2024)** provides a tiered risk framework for AI applications**; India can adopt a similar approach tailored to local contexts.**
- **Establish an Independent AI Regulatory Authority:** Create a centralized body like the **AI Ethics and Governance Authority of India** to oversee AI deployment, ensure compliance, and address grievances.
  - A dedicated regulator can ensure uniformity in AI governance across sectors, reducing fragmentation and misuse.
  - The **UK's Centre for Data Ethics and Innovation** serves as a model for addressing ethical AI use.
- **Mandate Algorithmic Accountability and Audits:** Introduce laws requiring AI developers to perform **regular audits of algorithms to detect biases, inefficiencies, and ethical lapses.**
  - Algorithmic biases in AI tools used for **hiring, lending, or policing** can lead to systemic discrimination if unchecked.
    - For example, In 2023, the Competition Commission of India highlighted concerns over price discrimination caused by **algorithmic pricing on e-commerce platforms.**
  - Mandate **Bias Impact Assessments (BIA) and Explainability Standards** as part of AI lifecycle management in critical sectors like healthcare and finance.
- **Strengthen Cybersecurity Regulations for AI Systems:** Develop robust cybersecurity standards for AI applications to **safeguard sensitive data and protect against AI-enabled cyber threats.**
  - CERT-In should **mandate regular vulnerability assessments** and adopt AI-specific threat monitoring systems to address risks.
- **Promote Responsible AI Use Through Regulatory Sandboxes:** Expand the use of regulatory sandboxes to **allow controlled testing of AI innovations** while ensuring safety and compliance.
  - Sandboxes enable **iterative testing and refinement of AI technologies** without posing large-scale risks.
  - It can be started with establishing **cross-sectoral sandboxes** under **NITI Aayog** to test AI in areas like **healthcare diagnostics, smart cities, and environmental monitoring.**
- **Integrate Ethical AI Principles into Education and Training:** Incorporate ethical AI development and responsible deployment into **higher education curricula and corporate training programs.**
  - Educating developers and decision-makers about AI ethics **ensures that future technologies prioritize inclusivity and fairness.**
  - **Make AI ethics training mandatory for all government-funded AI projects** and incentivize private firms to adopt similar programs.

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- **Ensure Data Transparency and Access Control:** Enhance transparency in AI systems by implementing **mandatory disclosures on data usage, model training, and decision-making processes.**
  - Without transparency, AI systems risk perpetuating **black-box decision-making,** reducing public trust.
  - Amend the **DPDP Act,2023 to include Right to Explanation provisions**, enabling users to understand AI-driven outcomes that affect them.
- **Incentivize Green AI Practices:** Encourage the development of **energy-efficient AI systems to mitigate their environmental impact.**
  - Training large AI models consumes massive energy, contradicting India's climate commitments under the Paris Agreement.
  - Provide **tax benefits for AI firms adopting green computing practices** and establish benchmarks for sustainable AI development.

Conclusion:

While AI has the potential to revolutionize various sectors in India, its **rapid adoption raises significant concerns regarding privacy, accountability, and bias**. India should regulate AI, but not at the cost of innovation. The existing legal framework, particularly the **Digital Personal Data Protection Act (2023),** needs to be strengthened to address the unique challenges posed by AI technologies. India must adopt a **comprehensive AI-specific legislation, establish regulatory bodies, and promote ethical AI practices to safeguard citizens' rights.**

■■■

Reforming India's Pharmaceutical Sector

This editorial is based on "Making affordable generics more reliable" which was published in The Hindu on 19/12/2024. Generic medicines are crucial for affordable healthcare in India, saving ₹30,000 crore by 2024, but quality concerns persist due to fragmented regulatory oversight. Despite multiple committee recommendations, the lack of centralized regulation highlights the need for comprehensive reform to ensure both affordability and quality.

Tag: GS Paper - 2, Government Policies & Interventions, Issues Relating to Development, GS Paper - 3, Industrial Growth

Generic medicines are vital for India's healthcare accessibility, having saved consumers an estimated **₹30,000 crore through government initiatives by 2024**. While bioequivalent to branded drugs, quality concerns persist. The current regulatory framework, split between Central Drugs Standard Control Organisation **and State Drug Regulatory Authorities, allows manufacturers to exploit weaker oversight,** undermining drug quality. Despite recommendations from multiple committees since **1954, India still lacks centralized pharmaceutical regulation,** highlighting the urgent need for comprehensive reform to ensure both affordability and quality in its pharmaceutical sector.

What is the Current Status of Pharmaceutical Regulation in India?

- **Regulatory Bodies**
  - **Central Drugs Standard Control Organization (CDSCO):** Established in 1940, **CDSCO is the primary regulatory authority overseeing the pharmaceutical sector.**
    - It ensures that drugs, cosmetics, and medical devices meet safety standards.
  - **Department of Chemicals and Petrochemicals:** Founded in 1991, DCP **handles policy and planning aspects of chemicals, petrochemicals, and pharmaceuticals,** supporting the sector's development.
  - **National Pharmaceutical Pricing Authority:** Created in 1994, NPPA is responsible for **price fixation, revision, and updating the list of drugs** under price control.
    - It ensures that the prices of essential medicines are regulated and monitored.
- **Key Policies and Regulations**
  - **Drugs Price Control:** The **Drugs Price Control Order (DPCO)**, first introduced in 1970**,** allows the government to regulate the prices of 74 bulk drugs and their formulations.

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- The **direct control over pricing,** while ensuring affordability, may discourage the production of these medicines by the industry.

❍ **Product Quality and Manufacturing Standards:** Good Manufacturing Practices **(GMP)** are enforced by the CDSCO to ensure that pharmaceutical plants and materials adhere to high-quality standards.

- The **National Pharmaceutical Policy** aims to strengthen GMP norms further.

❍ **Patent and Intellectual Property Regulations:** The Patent Act, 1970 (amended in 2005) governs the **patentability of drugs and outlines provisions for royalty, generic production immunity, patent opposition,** compulsory licensing, and export.

- TRIPS (Trade-Related Aspects of Intellectual Property Rights) provides protection for undisclosed information related to clinical trials.

➢ **Key Regulatory Guidelines**

❍ **Drugs and Cosmetics Act, 1940:** Governs the import, manufacture, distribution, and sale of drugs in India.

- **Schedule M:** Specifies the general and specific requirements for factory premises, materials, and equipment in the manufacture of certain drugs.
- **Schedule T :** Prescribes GMP specifications for manufacturing Ayurvedic, Siddha, and Unani medicines.
- **Schedule Y :** Lays down the legislative requirements for clinical trials.

❍ **Good Clinical Practice (GCP) Guidelines:** Drafted by the Ministry of Health, DCGI, and ICMR, based on **international standards like the Declaration of Helsinki and International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use ,** these guidelines regulate clinical research in human subjects.

❍ **The Pharmacy Act, 1948:** Regulates the pharmacy profession in India.

❍ **The Drugs and Magic Remedies (Objectionable Advertisement) Act, 1954:** Prohibits the advertising of drugs that claim to possess magical qualities.

❍ **The** Narcotic Drugs and Psychotropic Substances Act, 1985**:** Regulates operations involving narcotic drugs and psychotropic substances.

What are the Major Challenges Arising from Inadequate Pharmaceutical Regulation?

➢ **Proliferation of Substandard and Counterfeit Drugs:** Weak enforcement allows low-quality and counterfeit drugs to infiltrate the market, undermining public health and patient trust.

❍ This issue **disproportionately affects low-income countries,** where regulatory oversight is minimal, leading to higher morbidity and mortality rates.

❍ In India**, regulatory gaps enable substandard products** to thrive in a fragmented market dominated by small manufacturers.

❍ Examples include, **WHO estimates that 10% of drugs in low- and middle-income countries are substandard or falsified.**

- WHO linked Indian-made cough syrups to the **acute kidney failure and fatalities of children in Gambia.**

➢ **Erosion of International Trust in Exports**: Inconsistent adherence to global standards **damages the reputation of exporting countries**, reducing competitiveness in global markets.

❍ **Regulatory lapses**, including data fabrication and inadequate quality checks, erode confidence among international buyers.

- This hinders long-term economic gains for pharmaceutical exporting nations like India.

❍ Since the start of 2022, Indian drugmakers have been issued more than **9 FDA warning letters,** which may lead to a ban of new products into the US.

- The Ranbaxy scandal remains a landmark case of international regulatory failure.

➢ Antimicrobial Resistance **(AMR) Crisis:** Unregulated production and irrational use of antibiotics contribute to rising AMR, a critical global health threat.

❍ **AMR weakens healthcare systems**, as common infections become untreatable, leading to prolonged illnesses and higher mortality.

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- Lack of stringent oversight allows pharmaceutical companies to produce fixed-dose antibiotic combinations without adequate clinical trials.
- A recent survey reveals that a high number of Indian inpatients are prescribed multiple antibiotics, leading to antibiotic resistance.
  - **Nearly 64% of antibiotics sold in India are unapproved,** fueling resistance.

➢ **Adverse Drug Reactions and Lack of Pharmacovigilance:** Inadequate monitoring systems **fail to track and mitigate adverse drug reactions (ADRs),** posing long-term health risks.

- Regulatory authorities often lack resources and mechanisms to evaluate drug safety in real time, leading to avoidable complications.
- This also reflects poor post-marketing surveillance systems in developing countries.
- Despite 895 Adverse drug reaction monitoring Centre's India contribution to global ADR database is **only 2%**
  - In 2019, the recall of ranitidine due to **N-nitrosodimethylamine** contamination underscored the gaps in pharmacovigilance systems.

➢ **Barriers to Global Market Entry:** Inconsistent regulatory frameworks and lack of transparency in **standard-setting** hinder access to international markets for emerging pharmaceutical firms.

- These barriers prevent smaller manufacturers from scaling operations and competing globally.
  - **Non-compliance with Good Manufacturing Practices (GMPs)** is a significant limitation.
- With **only 19% of the 10,500 pharmaceutical manufacturing units** in India currently boasting **WHO-GMP certification.**
  - This significantly affects India's ability to penetrate regulated markets like the US and EU .

➢ **Environmental Damage from Pharmaceutical Waste: Unregulated pharmaceutical waste disposal** leads to severe environmental contamination, affecting ecosystems and public health.

- **Effluent discharge from manufacturing units,** especially in emerging economies, contributes to pollution in rivers and groundwater.
  - This issue is **compounded by weak enforcement** of environmental regulations.
- A recent study **identified pharmaceutical pollutants in 43.5% of global rivers**, with the Yamuna River among the most polluted.
  - **India is a major contributor to global antibiotic pollution,** exacerbating the AMR crisis.

➢ **Disparities in Access to Essential Medicines:** Inadequate price regulation and **monopolistic practices** make essential medicines unaffordable for marginalized populations.

- **Weak implementation of drug price** controls allows companies to charge exorbitant prices, worsening health inequities.
  - Lack of availability further exacerbates the issue in remote and rural areas
- Accessibility to affordable medicine at government medical stores is a challenge for the rural population.
  - As per a recent report, **only 12.2% respondents have access (within commutable distance from their villages)** to subsidised medicines at **Pradhan Mantri Jan Aushadhi Kendras.**

➢ **Ineffectiveness of Compliance Standards**: **Fragmented and complex regulatory systems** confuse manufacturers, reducing compliance rates and increasing product rejections in global markets.

- Different standards across agencies like **FSSAI, BIS, and APEDA** create redundancies and inefficiencies. This leads to low international acceptance of Indian pharmaceutical products.

What Measures can be Adopted to Enhance Drug Regulation in India?

➢ **Streamlining Regulatory Frameworks:** India needs a unified and transparent **regulatory structure to eliminate overlaps and ensure accountability.**

- Merging agencies like CDSCO and state-level bodies into a **Centralized Drug Authority** can improve coordination and compliance.
- This will standardize the **approval, testing, and monitoring processes, reducing inefficiencies.**
- Countries like the **US have centralized systems like the FDA,** which ensures consistency in drug regulation and enforcement across states.

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- **Strengthening Pharmacovigilance and Post-Marketing Surveillance:** Establishing robust pharmacovigilance systems is crucial to monitor **adverse drug reactions (ADRs)** and improve public safety.
  - Expanding the **Pharmacovigilance Programme of India (PvPI)** to include private hospitals, rural health centers, and e-pharmacies can increase ADR reporting.
  - Advanced data analytics and AI can predict potential drug risks early.
- **Enforcing Compliance with Good Manufacturing Practices (GMP):** Periodic audits and real-time monitoring of manufacturing facilities can ensure adherence to GMP standards.
  - Implementing **stricter penalties for violations and incentives for compliance will foster accountability.**
  - Introducing QR codes on drug packaging can help trace and verify compliance across the supply chain.
- **Creating a National Drug Database for Transparency:** A centralized, publicly accessible database listing **approved drugs, manufacturers, and regulatory statuses** can enhance transparency.
  - This will allow healthcare providers and consumers to verify drug authenticity and prevent the sale of unapproved or counterfeit products.
    - Integrating blockchain technology can further secure data integrity.
- **Improving Regulatory Capacity and Infrastructure:** Investing in a**dvanced testing laboratories, skilled workforce, and digital tools** will strengthen India's regulatory capacity.
  - **Allocating funds under the National Health Mission** for regulatory infrastructure can bridge gaps in rural and semi-urban areas.
  - Regulatory staff must undergo regular training in international standards and practices.
- **Harmonizing Domestic and International Standards:** India must align its drug standards with internationally accepted benchmarks like those of the **US FDA and European Medicines Agency (EMA).**
  - Bilateral agreements for mutual recognition of standards can reduce export rejections and enhance market access.
  - Introducing a **"Single Window Clearance System"** for export certifications can streamline approvals.
- **Encouraging Ethical Clinical Trials and R&D Oversight:** Strict guidelines for clinical trials, along with real-time monitoring, can ensure ethical practices and patient safety.
  - Establishing a **national oversight committee with AI-enabled monitoring** tools can track trial compliance effectively. Incentives like tax breaks for ethical R&D can foster innovation while maintaining ethical standards.
- **Regulating Online Pharmacies and Digital Platforms:** Digital platforms must be brought under **strict regulatory oversight to curb the sale of counterfeit and unlicensed drugs.**
  - **Mandatory registration of e-pharmacie**s and linking them to Aadhaar-enabled verification systems can improve accountability.
    - AI tools can monitor online transactions for irregularities.
- **Incentivizing Sustainable Pharmaceutical Practices:** Introducing **green manufacturing practices** can minimize environmental damage caused by pharmaceutical waste.
  - **Strict enforcement of effluent treatment norms** and subsidies for cleaner technologies can promote compliance.
  - Collaborating with agencies like **CPCB and MoEFCC** can ensure adherence to environmental guidelines.
- **Building Public Awareness and Consumer Empowerment:** Educating consumers about **safe drug usage, identifying counterfeit medicines, and reporting adverse effects is vital.**

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- Public campaigns through mass media, schools, and community programs can raise awareness. A **toll-free helpline and mobile app for drug-related grievances** can empower consumers.
- **"Be Aware, Report Counterfeit" campaign** can be introduced in India, ensuring greater public participation.

- **Developing Regional Drug Regulation Hubs:** Regional hubs with **advanced laboratories and regulatory offices** can decentralize oversight and improve efficiency.
  - These hubs can cater to specific needs like drug testing, inspections, and monitoring in underserved areas.
    - This will ensure timely enforcement and reduce the burden on central agencies.
- **Adopting Blockchain for Supply Chain Transparency:** Blockchain technology can ensure **end-to-end visibility of the pharmaceutical supply chain,** preventing counterfeit drugs from entering the market.
  - This technology can also **enhance product traceability, ensuring quality and compliance at every stage.**
    - A government-backed blockchain system can boost stakeholder confidence.
- **Creating a Real-Time Drug Recall Mechanism:** India needs a robust, **technology-enabled drug recall system** to quickly remove substandard or harmful drugs from circulation.
  - A centralized alert system linked to **manufacturers, wholesalers, and retailers can ensure immediate action.** Regular mock drills can enhance readiness for large-scale recalls.
- **Introducing Performance-Based Manufacturer Accreditation:** A **performance-based accreditation system** can incentivize manufacturers to comply with high-quality standards.
  - **Rankings based on adherence to GMPs**, environmental standards, and innovation can encourage healthy competition.
  - Regular updates to accreditation criteria will align practices with global advancements.

Conclusion:

Strengthening pharmaceutical regulation in India is crucial to ensuring both **affordability and quality in healthcare**. A unified regulatory framework, improved **pharmacovigilance, and stricter compliance with manufacturing standards** will enhance drug safety and international credibility. Emphasizing transparency, technological advancements, and sustainability can further elevate India's pharmaceutical sector. With proactive reforms**, India can better meet domestic healthcare needs and strengthen its position in the global market.**

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Navigating India-Russia Ties

This editorial is based on "5 ways in which India-Russia relationship will shape the world in 2025" which was published in The Indian Express on 20/10/2024. The article brings to picture the pivotal India-Russia partnership, highlighting its role in defense, energy, and global diplomacy, while underscoring the challenges India faces in balancing Western ties to maintain strategic autonomy.

Tag: GS Paper - 2, Bilateral Groupings & Agreements, Groupings & India's Interests, Effect of Policies & Politics of Countries on India's In

India-Russia relationship emerges as perhaps the most consequential bilateral partnership in global diplomacy, transcending mere strategic cooperation. Russia remains India's most accommodating partner in **high-tech defense and oil supplies.**Through this partnership, **India prevents Russia's complete pivot to China,** ensures stability in global energy markets, and maintains a **moderate voice in emerging power blocs like BRICS.** However, there are challenges for India to navigate, **such as balancing its ties with Western nations.** India needs to work proactively to safeguard its strategic autonomy and sustain this vital partnership amidst shifting global dynamics.

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How India and Russia Relations Evolved Over Time?

- **Cold War Solidarity (1950-1991):**
  - Soviet support for India on key issues like Kashmir and Goa's liberation reflected shared strategic interests.
  - The **1971 Treaty of Peace, Friendship, and Cooperation** was pivotal during the Bangladesh Liberation War.
- **Post-Soviet Adjustment (1991-2000):**
  - Following the Soviet Union's dissolution, India and Russia recalibrated their relationship to sustain defense and strategic ties.

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- **Strategic Partnerships:**
  - **2000**: The **Strategic Partnership Declaration** institutionalized cooperation across sectors.
  - **2010**: The partnership was elevated to a **Special and Privileged Strategic Partnership**, reflecting its unique depth.
- **Trade Expansion (Recent):**
  - Bilateral trade hit a record high of **$65.7 billion in FY 2023-24**, with India's exports growing by **42.7%** and imports declining by **39.9%**, showcasing reduced dependency on Russian oil.
    - **Key exports from India**: Pharmaceuticals, organic chemicals, and machinery.
    - **Major imports from Russia**: Oil, fertilizers, and minerals.
  - In **October 2024**, India and Russia convened their first working group meeting on the Northern Sea Route.

What is the Current Status of India-Russia Relations in a Changing Global Order?

- **Strategic Autonomy Amid Geopolitical Rivalries:** India's ties with Russia exemplify **strategic autonomy** as New Delhi strengthens partnerships globally **without aligning with any bloc.**
  - Amid Western sanctions, **India has deepened energy and defense ties** with Russia while maintaining strong relations with the **US and EU.**
  - During the **Indian Prime Minister's visit to Moscow in July 2024,** both countries outlined **India-Russia Special and Privileged Strategic Partnership,** aiming to significantly boost bilateral trade by 2030.
- **Energy Security as a Cornerstone:** India has leveraged Russia's pivot to **Asia for reliable energy access,** ensuring affordability and supply security.
  - European sanctions on Russian imports provided **India with an opportunity to secure energy at lower costs,** cushioning it from the volatility of global oil prices.
    - **Russian oil now accounts for 35% of India's total crude imports,** while bilateral trade hit $65.7 billion in FY 2023-24, reflecting pragmatic economic engagement.
  - Russian assistance in the **Kudankulam Nuclear Power Plant** continues to be a cornerstone of the partnership.
    - India's investments in Russian oil fields like **Sakhalin and Tomsk** ensure a steady supply of energy resources.
- **Defense Cooperation- From Buyer to Co-Developer:** The defense partnership has transitioned from procurement to co-development, enhancing India's indigenous capabilities and strategic autonomy.
  - Flagship programs like **BrahMos missiles and Su-30 MKI production** embody this evolution.
  - **Russia still supplies 45% of India's defense imports,** despite India diversifying to other suppliers like **France and Israel.**
  - In 2024, India and Russia expanded the **Make in India** initiative to include **joint production of high-speed electric trains** for Indian Railways.
- **Economic Diversification Beyond Energy**: Economic ties now focus on **technology, agriculture, and manufacturing**, reducing dependency on oil and fostering mutual growth.
  - The **Rupee-Ruble trade mechanism** and **FTA negotiations with Eurasian Economic Union (EAEU)** reflect this shift.
  - **Exports to Russia grew by 42.7% in 2024**, with pharmaceuticals and machinery leading the feat.
- **Connectivity to Reshape Global Trade:** India-Russia connectivity projects like **International North-South Transport Corridor and Chennai-Vladivostok Corridor** bypass traditional routes, reducing dependency on volatile maritime chokepoints.
  - These routes enhance logistical efficiency and reduce trade time.
  - **INSTC cuts shipping time by 40%**, while the **Chennai-Vladivostok Corridor reduces transit days from 40 to 24**, boosting bilateral trade efficiency.

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- **Geopolitical Synergy in Multilateral Platforms:** India and Russia share a **vision for a multipolar world** and collaborate on platforms like **BRICS, SCO, and G20** to counter Western dominance.
  - They advocate for local currency trade to diminish dollar hegemony. At the **BRICS Summit 2024**, India and Russia pushed for **alternative financial systems,** aligning with India's push for rupee-denominated trade.
- **Technology and Space Collaboration:** The partnership extends to cutting-edge fields like **AI, biotechnology, and space exploration,** reflecting a forward-looking dimension. India and Russia jointly enhance satellite navigation and lunar missions.
  - Partnerships on **GLONASS satellite navigation** demonstrate high-tech synergy.
  - In **2024**, India and Russia renewed commitments to cooperate on advanced space research**, including lunar and human space missions.**

What are the Challenges India Faces in Navigating Relations with Russia?

- **Balancing Ties with the West and Russia:** India's growing ties with the **US and EU,** especially through platforms like **Quad and trade agreements negotiations with EU and UK,** complicate its relationship with Russia.
  - Western pressure on India to align with sanctions against Russia puts its **strategic autonomy at stake.**
  - Despite Western scrutiny, **Russia was India's largest oil supplier in 2023.** U.S. officials have expressed concerns over India's significant purchases of Russian energy supplies, even warning of **potential "consequences,"** though they clarified that they would not impose **"red lines"** on India's oil imports.
- **Managing the Trade Deficit:** India's trade with Russia is heavily skewed, with imports **(mostly oil and fertilizers)** vastly outpacing exports, leading to a significant trade imbalance. Limited diversification of exports compounds the issue.

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- **In FY 2023-24, India's exports to Russia stood at $4.26 billion**, while imports reached **$61.44 billion**, resulting in a trade deficit of **$57.18 billion.**
- Pharmaceutical exports, though up **42.7%,** remain **insufficient to bridge the gap.**

- **Financial and Logistical Challenges**: Western sanctions on Russia complicate **financial transactions, investments, and logistics** for India-Russia trade, increasing costs and uncertainty.
  - Mechanisms like the **Rupee-Ruble trade** face implementation challenges.
  - The Vostro account system was created to facilitate trade in local currencies, but **its adoption has been slow** due to reluctance from **private banks** fearing secondary sanctions.
- **Navigating Russia-China Proximity**: Russia's growing alignment with **China,** particularly in the **Arctic and energy projects,** presents strategic dilemmas for India.
  - China's expanding influence in **Russia's Far East** also impacts India's connectivity ambitions.
  - Russia-China trade exceeded **$200 billion in 2023**, with major Arctic investments. While India operationalized the **Chennai-Vladivostok Corridor,** China's involvement in the **Northern Sea Route could limit India's access.**
- **Multilateral Pressure and Abstinence from Voting** : India's balancing act is strained by divergent stances on global crises like **Ukraine**, **where India's neutral position contrasts with expectations of Multilateral Institutions like the United Nation Security Council.**
  - For instance, In July 2024, India abstained from a **UN resolution demanding Russia cease aggression against Ukraine**, and withdraw from the **Zaporizhzhia nuclear plant.** This polarizes India's diplomatic engagements
  - At the **2024 G20 Summit,** India refrained from condemning Russia outright, maintaining neutrality.
- **Geopolitical Uncertainty in Central Asia:** India's strategic initiatives, such as INSTC, **depend on stable connectivity through Central Asia,** a region getting recently influenced heavily by **Chinese presence.**
  - Political instability in these states complicates India's outreach. For instance, INSTC trade volumes face delays due to **Iran's internal disruptions and geopolitical tensions in Kazakhstan**, a key transit country for this corridor.

What Measures can India Adopt to Balance Ties with Russia Amid a Disrupted Global Order?

- **Diversify Economic Engagement Beyond Energy:** India should **expand trade with Russia beyond oil and defense** by leveraging sectors like technology, pharmaceuticals, and agriculture.
  - Accelerating the **India-Eurasian Economic Union (EAEU) Free Trade Agreement** and incentivizing private-sector participation can boost non-energy trade.
  - Sectors like machinery and chemicals show potential for further expansion under **streamlined trade mechanisms.**
- **Enhance Defense Co-Development Under Make in India:** India can shift its defense partnership with Russia from procurement to co-development, focusing on joint ventures that align with Make in India goals.
  - **Co-production not only ensures technology transfer** but also reduces dependency, aligning with India's goal of becoming a global defense manufacturing hub.
- **Expand Arctic Collaboration and Energy Security Initiatives:** India should engage in joint Arctic projects with Russia, focusing on **energy exploration and shipping via the Northern Sea Route (NSR).**
  - Investments in **LNG infrastructure and polar navigation training** will secure India's long-term energy and trade interests.
  - The **October 2024 Arctic Cooperation Working Group** highlighted India's intent to use NSR for importing energy resources, offering strategic and economic benefits.
- **Promote Cultural and Educational Exchanges:** Expanding cultural diplomacy and people-to-people ties can strengthen long-term bilateral relations.
  - Initiatives like establishing **Indian cultural centers in Russia** and **encouraging Russian students to study in India can build goodwill.**
  - India's announcement of **two new consulates in Kazan and Ekaterinburg in 2024** provides a platform for fostering deeper educational and cultural exchanges.

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- **Focus on Renewable Energy Collaboration**: India should diversify its energy partnership with Russia by promoting **joint ventures in renewable energy, including solar, wind, and hydrogen**.
  - This aligns with India's green transition goals while maintaining its energy collaboration with Russia.
  - India's renewable energy sector is set to attract over $250 billion in investments, offering ample scope for Russia to partner in India's green energy ambitions.
- **Mitigate Trade Deficit Through Sector-Specific Strategies**: To address the trade imbalance, India should focus on sectors where it has competitive advantages, such as **IT services, textiles, and food processing.**
  - Establishing **special economic zones (SEZs) in Russia** for Indian exporters can boost exports.
- **Navigate the Russia-China Dynamic with Strategic Diplomacy:** India should tactically engage Russia to ensure its strategic interests are not overshadowed by Russia-China ties.
  - **Offering alternative investments** and collaboration in critical areas like the **Arctic, artificial intelligence, rare earth minerals, and space exploration** can maintain India's relevance.
- **Establish Joint Ventures in Fertilizer Production:** India can invite Russian investments in setting up fertilizer manufacturing plants in India to **reduce its dependence on imports** while **leveraging Russian expertise in raw material extraction.**
  - In 2023, fertilizers constituted **$2.63 billion of Indian imports from Russia.** Localizing production would cut costs and enhance India's agricultural self-reliance.
- **Enhance Cybersecurity and Digital Collaboration:** Given the increasing global reliance on digital technologies, India can partner with Russia to **strengthen cybersecurity frameworks, AI research, and digital infrastructure.**
  - Joint ventures in data protection technologies can ensure mutual benefit while diversifying bilateral ties.
  - **Russia's expertise in cybersecurity** tools complements **India's growing digital economy.**
- **Foster Strategic Tourism Alliances:** India and Russia could promote **bilateral tourism by creating exclusive travel packages,** joint cultural festivals, and simplified visa processes.
  - Expanding direct air routes and tourism marketing campaigns can boost people-to-people ties.
- **Build Academic Research Hubs Focused on Eurasian Studies**: India can establish **Eurasian research hubs to promote studies on Russian politics, culture, and economics.**
  - These hubs can guide Indian policymakers and businesses to make informed decisions regarding Russia and its neighbors.
  - Partnerships between institutions like **Jawaharlal Nehru University and Russian universities** could enhance scholarly exchanges, contributing to a deeper understanding of the region.

Conclusion:

The India-Russia relationship is a cornerstone of India's strategic foreign policy amid shifting global order. While the partnership continues to thrive in areas like **defense, energy, and multilateral diplomacy, challenges** such as trade imbalances, logistical hurdles, and Russia's growing proximity to China require careful navigation. By diversifying **economic ties, enhancing connectivity, and promoting joint ventures in emerging sectors,** India can ensure that its relationship with Russia remains **robust and contributes positively to global diplomacy.**

■■■

India's Strategic Collaboration with Gulf

This editorial is based on "India, Kuwait poised to transform relationship into strategic partnership" which was published in The Hindu on 22/12/2024. The article brings into picture the elevated strategic partnership between India and Kuwait, expanding beyond energy trade to include defense, technology, and infrastructure. This shift highlights India's growing influence in the Gulf, crucial for regional stability.

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

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India and Kuwait have elevated their centuries-old ties to a **comprehensive strategic partnership,** marking the **first visit by an Indian Prime Minister to Kuwait in over four decades.** The partnership transcends traditional energy trade dynamics, with **Kuwait holding 6.5% of global oil reserves** and **serving as India's 6th-largest crude supplier,** to encompass defense cooperation, technology transfer, and infrastructure development. This strategic upgrade reflects the **broader geopolitical shifts in the Gulf region,** where India's growing economic and diplomatic influence has become increasingly crucial for regional stability and prosperity.

What is the Gulf Region?

- **About**: The **Gulf Region**, also known as the **Persian Gulf Region** or **Arabian Gulf Region**, refers to the area surrounding the **Persian Gulf**, which is a marginal sea of the Indian Ocean located between the **Arabian Peninsula and southwestern Iran.**
- **Key Features of the Gulf Region:**
  - **Geography:** Comprises countries that border the Persian Gulf: **Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE).**

  - **Strategic Significance**: The **Persian Gulf** is connected to the **Gulf of Oman and the Arabian Sea via the Strait of Hormuz,** a crucial maritime choke point for global oil transportation
    - The Gulf is a **hotspot for geopolitical tensions,** including disputes between the **US and Iran, the Saudi-Iran rivalry, and the Yemeni Civil War.**
  - **Economic Diversification Efforts:** Countries like **Saudi Arabia and UAE are pursuing economic diversification plans** (e.g., **Saudi Arabia's Vision 2030**) to reduce dependence on oil through investments in technology, tourism, and renewable energy.

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- **Global Influence:** Gulf countries are influential players in international organizations like **Organization of the Petroleum Exporting Countries (OPEC), G20, and the UN.**
  - They host a significant expatriate workforce, particularly from South Asia, and serve as key trading and financial hubs (e.g., **Dubai, Abu Dhabi, Doha**).

What is the Significance of the Gulf Region for India?

- **Energy Security:** The Gulf region is pivotal for India's energy security, fulfilling **55.3% of India's crude oil demand in 2022–23** and recovering from a dip caused by increased **Russian imports post-Ukraine war.**
  - Recent agreements, like the **$78 billion deal with Qatar** to import **7.5 million tonnes of LNG annually till 2048**, underline India's reliance on Gulf resources to sustain economic growth and energy transition.
- **Trade and Economic Ties:** The Gulf is India's largest regional trading partner, contributing **15.8% of total trade in FY 2022–23**, surpassing trade with the **European Union.**
  - The UAE is India's **3rd largest trading partner**, and Saudi Arabia ranks **4th** targeting **India's infrastructure and manufacturing sectors.**
  - These engagements have resulted in trust-building, exemplified by joint infrastructure projects like the **$44 billion Ratnagiri Refinery** and active dialogue **on regional stability.**
- **Diaspora and Remittances:** Approximately **8.8 million Indians** live in the Gulf, contributing significantly to regional economies and remitting around **$60 billion annually** to India.
  - This expatriate population forms a critical bridge in India-Gulf relations, especially during crises like the **Covid-19 pandemic,** when India facilitated repatriation under the **Vande Bharat Mission.**
- **Strategic and Defence Cooperation:** Defence ties are deepening, with bilateral exercises like **Desert Flag (UAE)** and trilateral engagements like **India-France-UAE air combat exercises (Desert Knight).**
  - The Gulf's proximity to key maritime chokepoints ensures its importance in India's **"mission-based naval deployments"** for securing the **Gulf of Aden and the Arabian Sea.**
- **Emerging Geo-Economic Frameworks:** India is actively participating in initiatives like **I2U2 (India-Israel-UAE-USA)** and **IMEC (India-Middle East-Europe Corridor)** to enhance connectivity and diversify trade routes.
  - Despite challenges from the **Hamas-Israel war**, these frameworks **symbolize India's growing geo-economic influence in the region.**
- **Non-Oil Trade and Technology:** India and the Gulf are diversifying trade, with sectors like **technology, pharmaceuticals, and renewable energy** emerging as focal points.
  - Examples include the rising exports of **'Made in India' automobiles** and the UAE's **$15.3 billion FDI**, making it the **7th largest source** of investments in India.
  - Also, recently the **2024 IPL auction was held in Jeddah, Saudi Arabia**, marking the first time a cricketing event of this scale was hosted in the country.

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

- **Geopolitical Alignments and Diverging Interests:** India's growing ties with Israel, including participation in **I2U2 (India-Israel-UAE-USA)** and defence collaborations, sometimes create discomfort among Gulf nations sensitive to the **Palestine issue.**
  - While India has supported a **two-state solution**, the **Gulf's criticism of Israel's actions**, especially during the **2023 Hamas-Israel war**, contrasts with India's more neutral stance, risking strategic tensions.
  - For example, **India abstained on a UN resolution for ceasefire in Gaza**, a decision that drew mixed reactions from Gulf partners.
- **Energy Supply Vulnerabilities:** India's diversification of oil imports post-Ukraine war, with **Russia fulfilling 55% of India's crude imports in 2024**, has reduced Gulf's share.
  - While Middle Eastern oil imports have rebounded in mid-2023, Gulf suppliers face competition, straining their **traditional dominance over India's energy market.**
    - India's focus on renewable energy and **green hydrogen partnerships with nations like Japan and Australia** could further diminish the Gulf's role in India's energy landscape.

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- **Trade and FTA Negotiations Stalemate:** Despite announcements to revive negotiations for a **Free Trade Agreement (FTA)** with the **Gulf Cooperation Council (GCC)** in **2022**, progress has been slow due to disagreements over tariff reductions and non-oil trade diversification.
  - Trade with the GCC constitutes **15.8% of India's total trade**, but sectors like **pharmaceuticals** face barriers, including **pricing policies and market access restrictions.**
- **Maritime Security and Strategic Gaps:** While India plays a key role in **maritime security** in the Arabian Sea, gaps remain in coordinated anti-piracy operations and regional naval partnerships, partly due to Gulf nations' reliance on **US-led security frameworks**.
  - The Indian Navy's deployment of **12 ships in 2024** in response to **Red Sea** **and Gulf of Aden tensions** underscores India's commitment but also highlights its limited direct influence on regional security policies.

  - Initiatives like **bilateral naval exercises with UAE and Oman** are steps forward but fall short of fully integrated **Gulf-India maritime security collaboration.**

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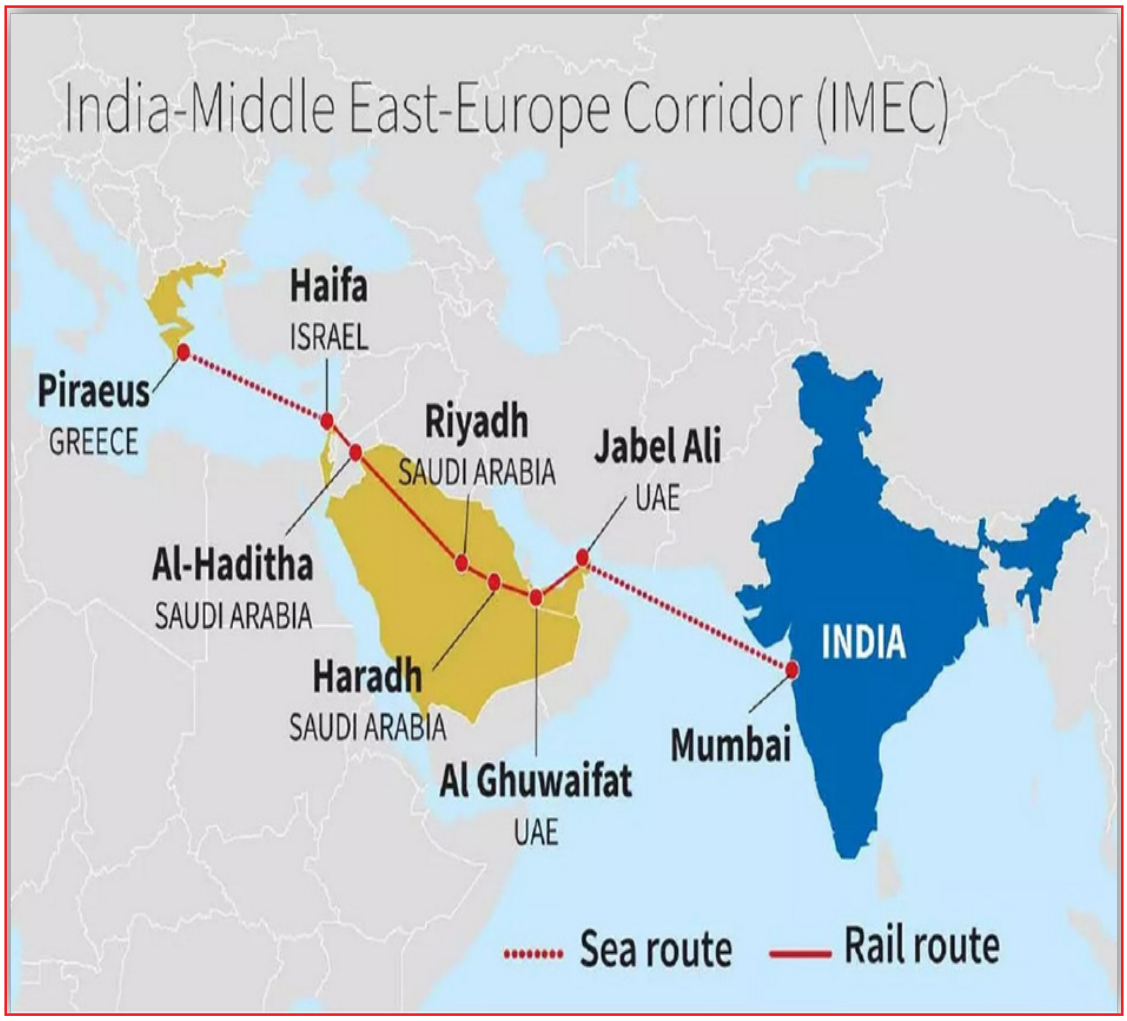
- **Diaspora-Related Visa and Employment Policies:** Gulf countries are increasingly prioritizing nationalization policies like **Saudi Arabia's Vision 2030** and **UAE's Emiratization**, which aim to reduce dependence on foreign workers, including Indians.
  - This shift threatens the livelihoods of **8.8 million Indian expatriates**, whose remittances account for **$60 billion annually** and contribute significantly to India's economy.
  - For example, **Saudi Arabia's Nitaqat policy** has led to tighter visa rules, forcing some Indian workers to return home or adapt to lower-paying jobs.
  - Also, instances of wage delays and unsafe working conditions, especially during the **2022 FIFA World Cup in Qatar**, have sparked domestic and global scrutiny.
- **Economic Corridor and Connectivity Rivalries:** While India is a key player in the **India-Middle East-Europe Economic Corridor (IMEC)**, the Gulf's focus on **China's Belt and Road Initiative (BRI)** creates competing visions for regional connectivity.
  - For example, Saudi Arabia's **$50 billion deal with China in 2024** underlines its strategic pivot, contrasting with **India's preference for diversifying away from Beijing-led frameworks.**
  - These competing alignments **risk diluting joint initiatives like IMEC** and delaying implementation amid geopolitical complexities.



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- **Border Security and Illegal Trade:** The Gulf's proximity to conflict zones like Yemen has resulted in challenges like **illegal arms and drug trafficking spilling** over into India's maritime borders.
  - Despite India's efforts in monitoring **maritime chokepoints**, incidents such as 2022, a Pakistani boat carrying 10 crew members, along with arms, ammunition, and **40 kg of narcotics valued at ₹300 crore**, was intercepted off the Gujarat coast, highlighting gaps in coordinated security efforts with Gulf partners.
  - The lack of a structured **GCC-India anti-trafficking framework** further exacerbates vulnerabilities in this area.
- **Food Security and Agricultural Policies:** Gulf nations rely heavily on food imports, but India's frequent bans on **wheat and rice exports**, as seen during **2022 and 2023 inflationary pressures**, strain the relationship.
  - For instance, India's **ban on non-basmati rice exports in 2023** caused **disruptions in Gulf markets,** which are dependent on Indian staples for their food supply chains.
  - The lack of a long-term, stable food trade agreement creates uncertainties, impacting both Gulf consumers and Indian farmers.
- **Cybersecurity and Digital Governance:** Gulf nations, especially the UAE, have advanced significantly in **cybersecurity frameworks**, often adopting **Western standards** or collaborating with **China's digital initiatives**, which may conflict with India's indigenous approaches.
  - India's push for **data localization laws** and stricter control of digital ecosystems **clashes with Gulf countries' reliance on open systems** to facilitate global business.
  - For example, India's exclusion from **China's Digital Silk Road including Gulf States like UAE** highlights emerging gaps in digital cooperation.

What Measures can India Adopt to Enhance its Relations with Gulf Countries?

- **Deepening Energy Cooperation Beyond Oil:** Shift focus **from a buyer-seller relationship to a co-development model in energy**, such as joint ventures in green hydrogen, solar, and wind energy projects.
  - Encourage **Gulf Sovereign Wealth Funds (SWFs) like the UAE's Mubadala and Saudi's PIF** to invest in India's renewable energy infrastructure under initiatives like the **National Green Hydrogen Mission.**
    - For instance, India can co-develop **green hydrogen facilities** with **Gulf nations,** leveraging their financial capital and India's technological edge in solar energy.
- **Strengthening Economic Partnerships via FTAs:** Fast-track the negotiation of a Free Trade Agreement (FTA) with the Gulf Cooperation Council (GCC) to unlock trade potential in sectors like **pharmaceuticals, food processing, and technology.**
  - Develop long-term frameworks for **staple food trade stability**, ensuring uninterrupted supply chains for Gulf nations dependent on **Indian exports like rice and wheat.**
  - India could also use its **Comprehensive Economic Partnership Agreement (CEPA) with the UAE as a template** to expand trade ties with other Gulf states.
- **Co-Developing Maritime and Logistics Infrastructure:** Collaborate with Gulf countries on building resilient and efficient maritime corridors, leveraging initiatives like the **India-Middle East-Europe Economic Corridor (IMEC).**
  - Set up joint logistics hubs in key Gulf ports **(e.g., Dubai, Jeddah)** to streamline supply chains and enhance connectivity to Africa and Europe.
  - For instance, **co-developing smart ports using Indian IT expertise** and Gulf capital can strengthen economic and strategic interdependence.
- **Enhancing Defence and Security Cooperation:** Collaborate on maritime security by establishing joint naval task forces to protect vital chokepoints like the **Strait of Hormuz and combat piracy in the Gulf of Aden.**
  - Develop **cybersecurity pacts to jointly counter cyber threats,** leveraging India's IT capabilities and Gulf nations' investments in digital infrastructure.
- **Leveraging Diaspora Diplomacy:** Establish a **Gulf-India Expatriate Council** to address issues like **employment, remittances, and labor rights collaboratively.**
  - Promote bilateral agreements for skilled worker mobility, focusing on sectors like healthcare and technology where Gulf nations face shortages.

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- For example, **expand the scope of India's eMigrate system to include Gulf labor market forecasts**, enabling a smoother flow of skilled Indian workers.

- **Expanding Cooperation in Healthcare and Pharmaceuticals:** Co-develop pharma hubs in Gulf countries, enabling **faster access to Indian generic medicines** and vaccines through joint production facilities.
  - Streamline regulatory approvals for Indian pharmaceutical exports, creating **fast-track pathways under a Gulf-wide healthcare agreement.**
  - For example, **India could set up vaccine manufacturing units in the Gulf** to cater to West Asian and African markets.
- **Enhancing Food and Water Security Ties:** Partner on agri-tech solutions, such as **using Indian expertise in crop diversification and Gulf funding to enhance food production** and supply chains.
  - Co-develop **desalination and water conservation technologies,** addressing shared challenges of water scarcity.
  - India could collaborate with the UAE's Water Alliance to expand these efforts into regions like the **Arabian Peninsula.**
- **Aligning on Climate Goals and Sustainability:** Develop a **Gulf-India Sustainability Forum** to co-invest in **carbon capture, solar desalination, and renewable energy technologies.**
  - Jointly promote initiatives in clean energy research, particularly in hydrogen and biofuels, aligning with India's energy transition and Gulf nations' diversification strategies.
  - For example, **India could partner with Saudi Arabia in its Green Initiative to expand tree plantation** and desert greening technologies.
- **Strengthening Multilateral Engagement:** Build stronger coordination with Gulf nations in global forums like the **G20, UN, and International Energy Agency (IEA)** to advocate shared interests in energy pricing, climate change, and trade.
  - For example, **India's 2023 G20 Presidency** and partnerships with Saudi Arabia and UAE on global energy governance showcased the potential for deeper multilateral ties.
- **Cultural and Educational Diplomacy** Establish Indian cultural centers like **BAPS Hindu Mandir Abu Dhabi** in major Gulf cities to deepen people-to-people ties through festivals, language training, and tourism promotion.
  - Enhance collaboration in education by opening Indian university branches in Gulf nations, catering to both Indian diaspora and Gulf citizens.
  - For instance, **co-developing STEM-focused education programs** could address skill shortages in Gulf economies while enhancing India's soft power.

Conclusion:

The strategic elevation of India-Kuwait relations signifies a transformative phase i**n India-Gulf Relations,** leveraging centuries-old ties to address contemporary challenges and opportunities. By focusing on **energy, trade, defense, and technology**, India and the Gulf can unlock their full potential while addressing **global and regional dynamics**. Strengthening people-to-people ties and embracing shared development goals will ensure long-term sustainability in their partnership.

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Climate Change Driving India's Green Economy

This editorial is based on "India's climate challenge and the rise of a new green economy" which was published in The Livemint on 24/12/2024. The article brings into picture the critical challenges India faces from climate change, such as rising floods and agricultural instability, while highlighting the opportunities for a green economic transformation through renewable energy, green hydrogen, and sustainable agriculture. Achieving this transition requires innovative financing and a focus on sustainability and urban resilience to set global benchmarks for sustainable development.

Tag: GS Paper - 2, GS Paper - 3, Renewable Energy Government Policies & Interventions

India faces critical challenges from climate change, including **rising floods and agricultural instability,** but also has unique opportunities for a green economic

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transformation. With a goal of **500 GW renewable energy by 2030** and advancements in **green hydrogen and sustainable agriculture,** India can become a model for developing nations. However, achieving this demands **innovative financing beyond public funds, given limited global climate finance.** Despite hurdles, India's focus on **renewables, sustainability, and urban resilience** could secure its future and set global benchmarks for a propelling green economy.

What is the Green Economy?

- A Green Economy is an economic system that aims to promote **environmental sustainability, social inclusion, and economic growth simultaneously.**
- It focuses on reducing environmental risks and ecological scarcities by investing in green sectors such as **renewable energy, clean technology, energy efficiency, and sustainable agriculture.**
- The goal is to create **jobs, improve well-being, and promote sustainable development** while minimizing the negative impact on the planet's natural resources.

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How Climate Change Vulnerability is Inducing India's Green Economy Transition?

- **Frequent Disasters Driving Renewable Energy Adoption:** India's increasing exposure to extreme climate events like **floods, heatwaves, and cyclones has disrupted energy supply chains** and underscored the fragility of fossil fuel dependence.
  - For instance, the **2023 Himachal Pradesh floods** caused widespread infrastructure damage, including **energy networks.**
  - India's total renewable energy installed capacity surged by an impressive 13.5% in just one year, reaching **203.18 GW in October 2024,** as part of its target to **reach 500 GW by 2030.**
- **Agricultural Losses Encouraging Sustainable Practices:** Erratic monsoons and rising temperatures, linked to climate change, have **heavily impacted crop yields and farmer incomes.**
  - Climate change could reduce wheat yields by **19.3% by 2050** and **40% by 2080,** while kharif maize yields may decline by **18% and 23%** in the same periods, with significant regional and temporal variations.
  - This vulnerability has driven initiatives like **Precision Farming, Zero-Budget Natural Farming** in **Andhra Pradesh** and the adoption of **climate-resilient seeds**, creating a market for sustainable farming practices.
    - In **August 2024**, The Indian Prime Minister **109 climate-resilient and bio-fortified varieties** of crops including 34 field crops and 27 horticultural crops.
- **Rising Sea Levels Promoting Coastal Adaptation Projects:** India's 7,500 km coastline faces threats from sea-level rise, endangering livelihoods and infrastructure in cities like **Mumbai and Chennai.**
  - A recent report estimated that **36 million Indians could be displaced by 2050** due to coastal inundation.
  - To mitigate this, projects like **mangrove afforestation** under the **Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI)** have gained momentum, aligning with India's green economy transition through nature-based solutions.
- **Heatwave-Induced Urban Energy Efficiency:** Increasing heat waves, with India recording over **200 heatwave days in 2022,** have escalated cooling demands, straining conventional energy sources.
  - The growing vulnerabilities have prompted urban areas to **adopt green building codes** and **energy-efficient cooling technologies.**
  - Initiatives like the **National Cooling Action Plan (NCAP)** aim to reduce cooling energy requirements by 20-25% by 2037-38, integrating sustainability into urban economic growth.
  - The **Perform, Achieve, and Trade (PAT) Scheme** incentivizes energy efficiency in industries, while **Renewable Energy Export Zones** promote green manufacturing.
- **Water Scarcity Catalyzing Green Innovations:** With India's per capita water availability declining from **5,177 m^3 in 1951 to 1,486 m^3 in 2022, climate-induced water stress** has spurred green economic activities such as wastewater recycling and solar-powered irrigation.
  - For example, the **Atal Bhujal Yojana,** focused on groundwater management, promotes renewable energy solutions for water extraction.
- **Biodiversity Loss Triggering Ecosystem-Based Solutions:** Deforestation and biodiversity loss due to changing climate patterns have **impacted ecological services vital for livelihoods.**
  - India's commitment to restoring **26 million hectares of degraded land by 2030,** as pledged at **COP15,** has led to **green economy initiatives like eco-tourism and agroforestry,** creating jobs while addressing climate risks.
  - The **Aravalli Biodiversity Park in Gurgaon, Haryana,** serves as a restored ecological hotspot that combats desertification and supports biodiversity.
- **Financial Risks Propelling Climate Finance Initiatives**: Frequent climate-related disasters have drawn attention to financial vulnerabilities. The cumulative total expenditure for **adapting to climate change in India is estimated to reach ₹85.6 lakh crore (at 2011-12 prices) by 2030**.

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- Green finance mechanisms, such as the **Sovereign Green Bonds** issued in 2023 worth ₹16,000 crores, fund renewable energy projects and sustainable infrastructure, making climate resilience a core component of economic policy.

➢ **Public Health Crises Accelerating Climate Action:** Climate change-induced health crises, such as the **rise in vector-borne diseases** due to warming temperatures, are **increasing healthcare costs**.

- Studies indicate that around **37.7 million Indians are affected by water borne diseases annually.**
- It has driven India to adopt green infrastructure solutions, such as the **Atal Mission for Rejuvenation and Urban Transformation (AMRUT),** which focuses on sustainable urban water supply and sanitation systems.
- Additionally, initiatives like the **Namami Gange Program** aim to clean and rejuvenate rivers, reducing water contamination and associated health risks

What are the Roadblocks in India's Transition Towards a Green Economy?

➢ **Insufficient Renewable Energy Infrastructure:** India's ambitious target of achieving 500 GW renewable energy capacity by 2030 faces hurdles due to **inadequate infrastructure and grid integration issues.**

- Currently, India has a percentage of on-grid renewable energy of **just 28.04%.** Furthermore, delays in projects like the **Green Energy Corridor,** aimed at improving grid connectivity, highlight the gap between policy goals and execution.

➢ **High Dependence on Fossil Fuels:** Despite progress in renewable energy, **77% of India's electricity generation comes from coal (as of FY23),** making it challenging to decouple economic growth from fossil fuels.

- The **Ministry of Coal** has achieved significant growth in overall coal production, reaching **384.08 million tonnes (Provisional) up to August 2024** reflecting its entrenched role in India's energy mix.
- The lack of a robust strategy for phasing out coal plants undermines efforts to transition toward a green economy.

➢ **Financial Constraints and Lack of Climate Finance:** The transition requires massive investments, with **NITI Aayog estimating a need for $10.1 trillion by 2070 to achieve net-zero targets.**

- However, green financing remains limited, with India's clean energy investment standing at **$17 billion in 2022**.
- The **2023 Sovereign Green Bond issuance worth ₹16,000 crores** is a step forward but insufficient to meet the scale of demand.

➢ **Policy and Regulatory Uncertainty**: Frequent changes in renewable energy tariffs and unclear regulations deter private investments in green projects.

- For example, **solar developers faced setbacks due to the imposition of the Basic Customs Duty (BCD) on solar imports**, raising project costs by 20-25%.
- Such unpredictability undermines investor confidence and delays green initiatives.

➢ **Challenges in Transitioning the Workforce:** The shift from **carbon-intensive industries to green sectors** threatens millions of jobs, particularly in coal-dependent states like Jharkhand and Chhattisgarh.

- Accelerated decarbonisation could transform over **30 million jobs by 2050**. The **absence of robust skill development programs hampers the ability of workers** to transition to green jobs.

➢ **Lack of Public Awareness and Behavior Change**: Sustainable consumption practices remain underdeveloped, with high energy wastage in urban and rural areas.

- Only a **fourth of the electrified households have heard of Bureau of Energy Efficiency's (BEE) star labels** (launched in May, 2006), with even lower awareness among rural consumers. **(Council on Energy, Environment and Water)**
- Limited public awareness campaigns and weak enforcement of programs like **Ujala for LED adoption slow the transition.**

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- **Technological Gaps and Dependence on Imports:** India's green technology landscape, especially for **battery storage and solar panels,** heavily relies on imports, primarily from China.
  - India's solar sector imports reached **$7 billion in FY 2024, of which $3.89 billion came from China alone,** exposing India to geopolitical risks.
  - The absence of domestic manufacturing capacity undercuts the government's **PLI Scheme for Solar Manufacturing,** slowing self-reliance in green technology.
- **Climate Change Impacts on Renewable Projects:** Ironically, climate vulnerabilities, such as **erratic weather and extreme events,** disrupt renewable energy generation.
  - For example, Wind energy generation in Tamil Nadu is projected to decline by **5% in 2024-2025 compared to 2023-24**, due to unpredictable wind patterns.
  - Similarly, **rising temperatures are reducing the efficiency of solar panels**, with studies indicating significant efficiency loss for every degree Celsius rise.
- **Urbanization and Resource Scarcity:** Rapid urbanization, **expected to add 600 million urban residents by 2031,** creates resource pressures that undermine sustainability goals.
  - Poor urban waste management, where only **22-28% of solid waste is processed,** leads to environmental degradation.
  - Projects under the **Smart Cities Mission have seen delays**, limiting progress in green urban development.
- **International Trade and Carbon Border Taxes**: Emerging policies like the European **Union's Carbon Border Adjustment Mechanism (CBAM)** pose challenges for India's exports, particularly for steel and aluminum.
  - CBAM will affect **15-40% of Indian steel exports to Europe.** This creates a competitive disadvantage for Indian firms struggling to balance economic and environmental priorities.
- **Fragmented Governance and Coordination Gaps:** The lack of inter-departmental coordination between ministries, such as **Environment, Power, and Finance, often results in fragmented policy implementation.**
  - For instance, overlapping jurisdiction between the **Ministry of Renewable Energy and State Electricity Boards** delays renewable energy projects.
- **Limited R&D Investment in Green Technologies:** India's expenditure on R&D for renewable technologies is only **0.7% of GDP,** far below global leaders like Germany and the USA.
  - This lack of funding slows innovation in areas such as **green hydrogen, energy storage, and carbon capture.**
  - For example, **India lags in carbon capture projects,** despite being the third-largest emitter of CO_2 globally.
- **Transportation Challenges in Electrification Goals:** The transport sector, contributing **14% of emissions,** faces significant challenges in transitioning to EVs due to inadequate charging infrastructure and high vehicle costs.
  - As of 2024, India has only 25,000 public charging stations. Moreover, the **discontinuation of subsidies under the FAME-II scheme** has further slowed EV adoption.
- **Social Resistance to Land Acquisition for Renewable Projects:** Land conflicts often delay renewable energy projects, as large-scale solar and wind farms require significant land acquisitions.
  - For example, the **Bhadla Solar Park in Rajasthan**, one of the largest globally, faced protests from local communities due to concerns over displacement.

What Measures India Can Adopt to Accelerate Transitioning Towards a Green Economy?

- **Scaling Up Renewable Energy Infrastructure with Grid Modernization:** India should focus on expanding renewable energy projects while upgrading grid infrastructure to integrate intermittent sources like **solar and wind.**

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- Establishing **regional grid-balancing systems,** as envisioned under the **Green Energy Corridor,** can address underutilization of renewables and ensure stable supply.
- Enhanced Collaboration with the **One Sun, One World, One Grid (OSOWOG)** initiative can further drive investments and position India as a global renewable energy hub.

➢ **Enhancing Domestic Manufacturing for Green Technologies:** Promoting **local manufacturing of solar panels, wind turbines, and energy storage systems** through the **Production-Linked Incentive (PLI) Scheme** can reduce dependence on imports.
- This aligns with India's goal to produce **110 GW of solar module manufacturing capacity by 2025-26**, minimizing reliance on Chinese imports.
- Coupling this with the **Make in India initiative** can drive job creation and green industrialization.

➢ **Boosting Green Finance through Innovative Mechanisms**: India should expand access to green financing by launching **more Sovereign Green Bonds.**
- Establishing a **Green Credit Guarantee Fund for MSME**s can incentivize sustainable practices and lower borrowing costs.
- Integration of private investment through platforms like the **National Investment and Infrastructure Fund (NIIF)** can further mobilize resources for large-scale green projects.

➢ **Developing Integrated Land-Use Policies for Renewable Projects**: To address land acquisition challenges, India needs a **unified policy framework for renewable energy projects** that balances ecological and social concerns.
- Linking the **National Land Records Modernization Programme (NLRMP)** with renewable development can streamline land allocation.
- Using degraded or wasteland for solar and wind farms, like **Thar Desert and arid regions of Gujarat,** minimizes displacement and environmental harm.

➢ **Expanding Electric Vehicle Ecosystem**: Building robust EV infrastructure, including **charging networks and battery recycling units,** can accelerate the transition in the transport sector.
- India should target **new EV charging stations annually linking them with Dhabas and Petrol Pumps, with significant incentives,** focusing on urban and highway networks.
- Linking the **FAME scheme with the Battery Waste Management Rules (2022)** can create a circular EV economy, promoting sustainability and reducing import dependency on lithium-ion cells.

➢ **Promoting Climate-Resilient Agriculture:** Scaling up sustainable farming practices, such as **organic farming and micro-irrigation,** under the **Paramparagat Krishi Vikas Yojana (PKVY)** can improve resilience and reduce emissions.
- Linking this with the **National Innovations in Climate Resilient Agriculture (NICRA)** can enable farmers to adopt climate-smart technologies, reducing crop losses.
- For example**, precision farming using drones,** promoted in the **Drone Didi Scheme,** can optimize resource usage.

➢ **Establishing a National Carbon Pricing Framework:** Implementing a comprehensive carbon pricing mechanism, including an **Emission Trading Scheme (ETS)**, can incentivize industries to adopt low-carbon technologies.
- Expanding **pilot ETS programs in Gujarat and Maharashtra** to a nationwide platform could generate a huge sum annually**, funding renewable energy and climate adaptation**. Carbon pricing also aligns India with global trade frameworks like the **EU's CBAM.**

➢ **Integrating Circular Economy into Industrial Processes:** India must adopt **circular economy practices** across sectors like construction, electronics, and textiles to minimize waste.
- For instance, mandating the **use of 30% recycled materials in construction projects under the Smart Cities Mission** can promote sustainability.
- Encouraging **startups in waste management through initiatives like the Startup India Seed Fund Scheme** can boost innovation and job creation.

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- **Strengthening Urban Green Infrastructure:** Expanding green urban projects such as **green roofs, solar rooftops, and waste-to-energy plants** under the Smart Cities Mission can make cities sustainable.
  - Integrating the mission with the **National Solar Mission** can incentivize rooftop solar adoption, especially in metro cities.
  - For example, **Surat's integrated waste-to-energy and solar initiatives** have reduced urban emissions.
- **Empowering Communities through Grassroots Green Movements**: Promoting citizen-led initiatives under programs like **Lifestyle for Environment (LiFE) can amplify green practices at the grassroots.**
  - This includes awareness campaigns on sustainable consumption and waste segregation.
  - Linking **LiFE with the Swachh Bharat Mission can foster behavioral changes,** improving waste management and recycling at the community level.
- **Expanding Mangrove and Wetland Restoration Programs:** India should scale up nature-based solutions by restoring mangroves and wetlands to enhance carbon sequestration and coastal resilience.
  - The **Mangrove Initiative for Shoreline Habitats and Tangible Incomes (MISHTI)** can be integrated with **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)** to provide livelihood opportunities.
- **Investing in Large-Scale Energy Storage Solutions:** Developing advanced battery storage technologies, such as l**ithium-ion and sodium-ion**, is essential for renewable energy integration.
  - Establishing **gigafactories under the PLI scheme for energy storage** can meet India's projected demand of 30 GW storage by 2030.
  - Collaborating with global firms like **Tesla and CATL can fast-track this initiative.**
- **Developing a Green Skills Workforce:** Launching a **National Green Skill Development Mission** can prepare India's workforce for green economy jobs in renewable energy, EVs, and sustainable manufacturing.
  - Integrating this with existing programs like **Skill India** can upskill workers from traditional industries, **enabling a smooth transition.**
  - For instance, **training coal-sector workers in Jharkhand for solar panel installation** can create inclusive opportunities.

Conclusion:

India's transition to a **green economy is not just an environmental necessity but a pathway to sustainable growth,** directly aligning with the United Nations Sustainable Development Goals (SDGs). The SDGs, particularly **Goal 7: Affordable and Clean Energy and Goal 13: Climate Action** are central to India's green economy aspirations. By advancing renewable energy sources, fostering green hydrogen, and promoting sustainable agriculture, India contributes to SDG 7 while addressing agricultural instability and mitigating climate risks.

■■■

Rural Resilience and Development

This editorial is based on "Building rural resilience" which was published in The Hindu on 25/11/2024. The article brings into picture the vital role of rural resilience, highlighting how initiatives like Kerala's Kudumbashree and Gujarat's water conservation counter challenges like monsoons and groundwater depletion, safeguarding India's future and cultural heritage.

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

With over **65% of India's population living in villages**, the resilience of **rural India** is inextricably linked to the nation's future. From erratic monsoons and groundwater depletion to **agricultural market volatility and rapid technological change**, Indian villages face a complex web of challenges that threaten centuries-old farming traditions. Yet, across the country, from **Kerala's Kudumbashree Movement to Gujarat's water conservation revolution,** rural communities are demonstrating remarkable adaptability and innovation. Building rural resilience in India isn't merely about agricultural sustainability, it's about **preserving the cultural cornerstone of the world's largest democracy.**

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What are the Key Factors Driving Rural Growth in India?

- **Infrastructure Development:** The expansion of rural infrastructure through flagship programs like the **PM Gram Sadak Yojana (PMGSY) and Jal Jeevan Mission** has significantly enhanced connectivity and basic amenities.
  - Improved infrastructure facilitates market access, boosts local enterprises, and reduces regional disparities.
  - In the last 21 years, **more than 7 lakh kms of rural roads** have been constructed under the PMGSY. These initiatives are crucial for socio-economic upliftment in rural areas.
- **Digital Inclusion and FinTech Penetration:** Rising smartphone penetration and the success of platforms like **Unified Payments Interface and Aadhaar-enabled payment systems (AEPS)** are transforming rural economies by fostering financial inclusion and e-commerce.
  - Unified Payments Interface (UPI) transactions at retail stores in rural and semi-urban India **rose 118% in 2023** due to affordable internet access via **BharatNet and low-cost smartphones.**
- **Agricultural Reforms and Allied Activities:** Support for agribusiness and allied sectors like fisheries and horticulture under schemes such as **PM-KISAN and the National Livestock Mission** has diversified rural incomes.
  - The **National Agriculture Market (eNAM)** enabled farmers to access better prices for their produce, increasing farm-to-market efficiency.
  - As of **January 2024**, the total credit disbursed to agriculture amounted to **₹22.84 Lakh Crore**, reflecting enhanced investment.
- **Rise of Rural MSMEs and Start-ups:** Policy support through the **Startup India Rural Program and MUDRA Yojana** has driven the growth of micro, small, and medium enterprises (MSMEs) in rural areas.
  - These initiatives provide credit and skill training, enabling entrepreneurship. As per **National Sample Survey (NSS) 73rd Round**, 31% of total MSMEs are engaged in the manufacturing sector with more than **50% in the rural sector,** creating sustainable livelihoods.
- **Decentralized Renewable Energy Initiatives:** The push for **decentralized solar power and clean energy under schemes like PM-KUSUM** has reduced rural energy costs and dependency on traditional fuels.
  - India's renewable energy installed capacity witnessed remarkable growth, increasing by **24.2 GW (13.5%)** to reach 203.18 GW as of **October 2024** and PM-KUSUM benefited **2.46 lakh farmers by ensuring access to solar pumps,** reducing input costs, and increasing agricultural sustainability.
- **Health and Social Welfare Expansion:** Programs like **Ayushman Bharat (recent extension to Senior Citizens above 70) and the Pradhan Mantri Matru Vandana Yojana (PMMVY)** have improved health outcomes and social security in rural areas.
  - Affordable healthcare and insurance for the poor have reduced out-of-pocket expenses, increasing disposable income.
  - In May 2023, the Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB PM-JAY) reached a significant milestone, recording **5 crore hospital admissions** with a total expenditure of ₹61,501 crore under the scheme.
- **Rural Tourism and Cultural Heritage:** Rural tourism, promoted under the **Dekho Apna Desh initiative,** is creating new revenue streams by leveraging India's diverse cultural heritage and especially through GI Tags associated with rural small scale industries.
  - States like **Rajasthan and Kerala have developed eco-tourism circuits,** attracting both domestic and international tourists.
- **Women Empowerment and SHGs: Women's Self-Help Groups (SHGs) under the National Rural Livelihood Mission (NRLM)** have transformed rural societies by enhancing women's participation in economic activities.
  - **Over 8.7 crore women are now part of SHGs,** with total SHGs crossing **81 lakhs.**
  - This empowerment leads to better **decision-making, improved family welfare,** and higher rural household incomes.

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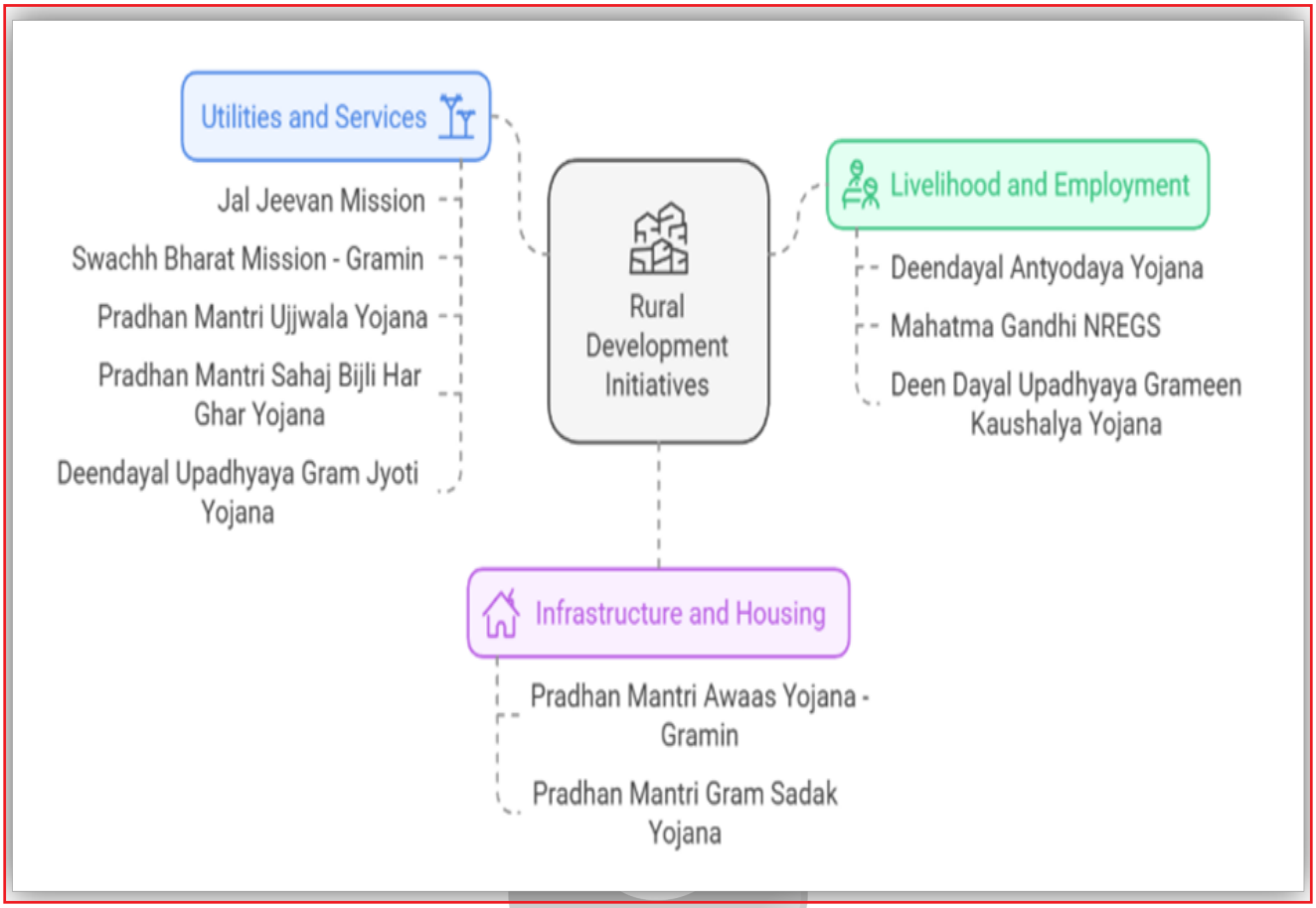

What are the Key Issues Related to India's Rural Landscape?

- **Agrarian Distress and Low Income Levels**: India's rural economy is heavily reliant on agriculture, yet the sector faces issues like **fragmented landholdings, low productivity, and erratic weather patterns** due to climate change.
  - Farmers continue to struggle with falling incomes despite government support schemes.
  - The **NABARD report** revealed that in 2021-22, the average monthly income of a farming household from all sources stood at just **₹13,661**.
  - Also, the contribution of agriculture to India's GDP dropped to **15% in 2022, compared to 35% in 1990-91.**
- **Inadequate Health Infrastructure**: Rural areas face a critical shortage of healthcare facilities, trained professionals, and awareness, leading to poor health outcomes.
  - Even flagship programs like **Ayushman Bharat** struggle to address infrastructure gaps in remote areas.
  - A survey stated that **only 25% of the semi-rural and rural population in India** have access to modern healthcare within their localities.
  - Approximately **75% of health infrastructure and resources are concentrated in urban areas**, where only **27% of the population resides**, leaving rural populations underserved.
- **Educational Inequality and Digital Divide**: While school enrollment has improved under schemes like **Samagra Shiksha Abhiyan**, rural education still suffers from **inadequate infrastructure, teacher shortages, and poor digital access.**

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- A report by the **Pratham Foundation** reveals that **nearly 43% of children aged 14-18 struggle to read sentences in English.**
  - Additionally, the ASER survey highlights that **25% of rural children face difficulty reading a Class 2-level text** in their regional language.
- And lack of consistent internet penetration limits access to online education.

- **Unemployment and Underemployment**: Despite schemes like **MGNREGA**, rural areas face high unemployment and disguised underemployment, particularly among youth.
  - Seasonal agricultural work fails to provide consistent income, pushing migration to urban areas.
  - **Rural unemployment rate** rose to 9.3% in June 2024 (CMIE), while **a larger chunk of rural workforce remains under disguised employment**.
- **Lack of Access to Safe Drinking Water and Sanitation**: Despite progress under the **Jal Jeevan Mission**, many rural households still lack **consistent access to clean drinking water and proper sanitation facilities.**
  - Open defecation persists in some areas due to behavioral and infrastructural gaps.
  - As of September 2023, over **67% of rural households have access to clean water at the flick of a tap**. Also, **12 Indian states have uranium levels** beyond permissible limits in their groundwater
- **Climate Change and Environmental Degradation**: Rural livelihoods are vulnerable to climate change, which **exacerbates droughts, floods, and soil degradation**, threatening agriculture and allied activities.
  - Poor waste management and deforestation add to the environmental crisis.
  - Recent years have seen a **threefold increase in widespread extreme rainfall events** over central India, leading to a steady rise in flash floods with significant socio economic losses especially in rural areas.
- **Social Inequalities and Gender Disparities**: Caste-based discrimination, gender inequality, and lack of opportunities for marginalized communities remain pervasive in rural India.
  - Women often face limited access to **education, healthcare, and employment.**
  - The **WEF Global Gender Gap Report 2017** states that on an average **66% of women's work in India is unpaid,** most of them reside in rural areas, highlighting financial exclusion.
- **Financial Exclusion and Credit Constraints**: Access to formal credit remains a challenge, as rural households often rely on informal moneylenders who charge exorbitant interest rates.
  - Despite initiatives like **MUDRA Yojana**, small and marginal farmers lack sufficient institutional credit support.
  - A 2020 report stated that among small and marginal farmers (SMFs) who availed credit, **59% (or 36 million) turned to formal sources,** while **41% still depended on informal channels.**
- **Weak Local Governance and Bureaucratic Inefficiency**: **Panchayati Raj Institutions (PRIs) often lack the funds, capacity, and autonomy** to effectively implement rural development programs.
  - Corruption and bureaucratic inefficiencies delay the benefits of schemes.
  - In the **Public Distribution System (PDS)**, cases of corruption and inefficiencies in local governance have resulted in food grains meant for rural households **being diverted or sold in the black market.**
    - For instance, in **Uttar Pradesh**, investigations revealed a scam where local officials colluded with ration shop owners to deprive intended beneficiaries of their entitlements.

What Measures can be Adopted to Promote Rural Growth and Resilience?

- **Expanding Climate-Smart Agriculture (CSA)**: Promote widespread adoption of CSA practices like crop diversification, agroforestry, and precision farming to reduce vulnerability to climate change.

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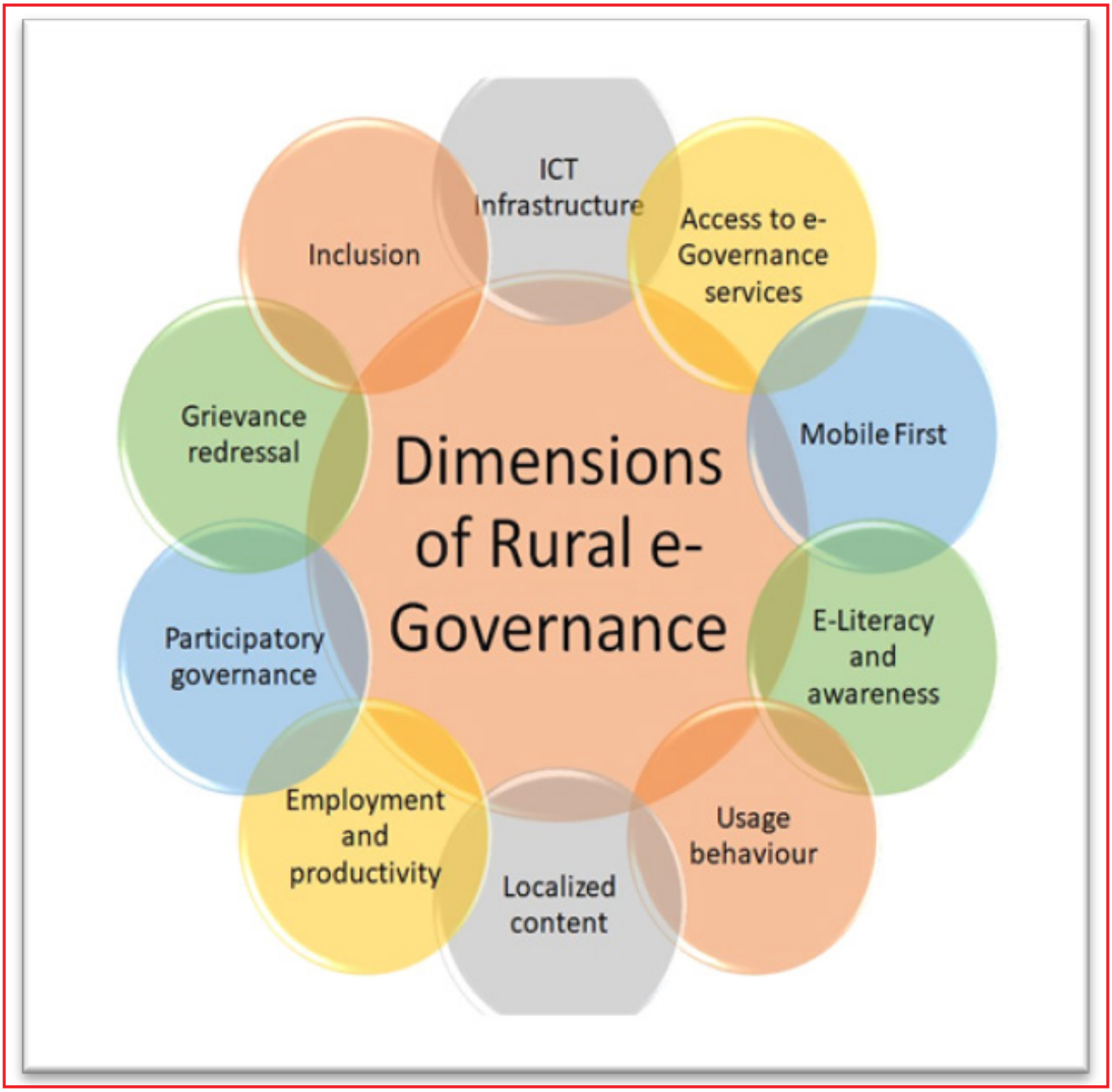
- Integrate schemes like **PM-KUSUM** with localized irrigation solutions and renewable energy.
- For example, farmers in Gujarat's **Banaskantha district** are using solar-powered irrigation, reducing water wastage, while improving crop yields.

➢ **Integrating Technology in Rural Governance**: Leverage technology to improve the efficiency of rural governance through platforms like **e-Gram Swaraj** for transparent fund allocation and monitoring.

- Linking **Digital India** initiatives with Panchayati Raj can enhance accountability and service delivery.
- The Ministry of Panchayati Raj is implementing **e-Panchayat Mission Mode Project (MMP)** with the aim of making Panchayats more transparent, accountable is a significant step.



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- **Strengthening Public-Private Partnerships (PPPs)**: Encourage private-sector involvement in skill development, infrastructure, and healthcare by creating rural-centric PPP models.
  - Partnering companies under **CSR initiatives** can amplify the impact of government schemes.
  - For instance, **ITC's e-Choupal** connects **farmers with markets,** benefiting **farmers** by providing real-time market information and quality inputs.
- **Promoting Integrated Rural Entrepreneurship**: Support diversified rural entrepreneurship by creating rural hubs for agri-processing, handicrafts, and eco-tourism.
  - Linking **MUDRA loans** with capacity-building initiatives can amplify the outcomes.
  - The **Dastkar initiative in Rajasthan**, which empowers rural artisans by connecting them to national markets, **increased their household incomes.**
- **Enhancing Local Water Governance**: Empower **Gram Panchayats and SHGs** to implement water conservation projects like **watershed management, rainwater harvesting**, and decentralized water distribution systems.
  - Scale successful projects like the **Jalyukt Shivar Abhiyan** in Maharashtra, which rejuvenated **11,000 villages**, increasing groundwater levels and reducing crop failures.
- **Mainstreaming Renewable Energy in Rural Development**: Implement solar micro-grids, biogas plants, and wind energy projects in rural areas to meet power demands sustainably.
  - Expand schemes like **PM-KUSUM** and provide incentives for renewable energy adoption.
  - Villages like **Dharnai in Bihar**, powered entirely by solar energy, are models of **self-sufficiency,** with energy reliability driving entrepreneurship and education.
- **Reforming Agricultural Marketing Systems**: Strengthen the **eNAM platform** by enhancing digital literacy and expanding physical market infrastructure for farmers.
  - Promote direct farmer-to-consumer sales models through farmer producer organizations (FPOs).
  - The success of **Sahyadri Farms** in Maharashtra, which eliminated middlemen and provided farmers higher incomes, illustrates the potential of robust rural marketing reforms.
- **Transforming Rural Transport and Connectivity**: Expand rural road infrastructure under **PM Gram Sadak Yojana (PMGSY)** and develop multimodal transport systems for better market access.
  - Complement this with digital infrastructure like **BharatNet** for seamless e-commerce integration.
  - The **Bhagalpur silk hub in Bihar**, now accessible via improved roads, has seen a rise **in exports**, demonstrating the impact of connectivity on livelihoods.
- **Developing Sustainable Rural Housing**: Introduce disaster-resilient housing technologies, combining local materials with modern methods under **PM Awas Yojana (Gramin)**.
  - Promote **green housing designs** to reduce energy costs and environmental impacts.
  - Villages rebuilt in **Kashmir post-2014 floods**, using **eco-friendly reinforced concrete,** are now resistant to future climate shocks, proving cost-effective and sustainable.
- **Building Grassroots Disaster Management Systems**:Equip rural communities with training, early warning systems, and evacuation plans tailored to local vulnerabilities.
  - Expand **State Disaster Response Forces (SDRF)** into rural areas.
  - **Odisha's cyclone shelters network**, combined with community training, saved thousands of lives **during Cyclone Fani in 2019**, proving the efficacy of proactive disaster management.
- **Revitalizing Cooperative Institutions**: Strengthen cooperatives to address credit, marketing, and procurement gaps in rural areas.
  - Streamline their functioning with digitized operations and skill enhancement programs.
  - **Amul model-Cooperative societies** have created **self-reliant rural economies** in the dairy sector, ensuring consistent farmer incomes.

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- **Fostering Knowledge-Based Agriculture**: Set up knowledge hubs in villages to train farmers in modern techniques like **hydroponics, organic farming, and digital tools.**
  - Link these hubs with **Krishi Vigyan Kendras (KVKs)** for research-backed solutions.
  - For instance, villages **experimenting with precision farming** have reduced fertilizer usage, ensuring cost savings and environmental benefits.
- **Empowering Youth with Digital and Green Skills**: Introduce rural youth to green jobs and digital economy opportunities through specialized training under **Skill India Mission**.
  - Partner with private players for certifications in renewable energy, IT, and logistics.
- **Focusing on Inclusive Social Welfare**: Integrate health, nutrition, and gender-focused programs like **POSHAN Abhiyaan** and **Mission Shakti** for comprehensive rural welfare. Ensure last-mile delivery through real-time tracking and local accountability.
  - The **Kerala Kudumbashree model**, which integrates social and economic welfare through women's collectives, has successfully reduced poverty and malnutrition rates in the state.
- **Strengthening Rural Healthcare Systems**: Investments in healthcare infrastructure, mobile health units, and telemedicine can improve access to rural healthcare.
  - Expanding **Ayushman Bharat Health and Wellness Centers (HWCs)** to include diagnostics and specialist consultations will address gaps.
  - The success of **Karuna Trust's telemedicine model in Karnataka**, demonstrates that technology-driven healthcare is a scalable solution for rural resilience.
- **Strengthening Rural Governance**: Empowering **Panchayati Raj Institutions (PRIs) with greater autonomy** and resources can drive better implementation of schemes. Capacity-building programs for PRI members, coupled with transparency mechanisms, can improve accountability.
  - The **Participatory Governance Model** in **Pune**, has demonstrated how inclusive governance strengthens rural development outcomes.

Conclusion:

Building rural resilience in India is **pivotal for the nation's future.** It requires a holistic approach that integrates **infrastructure development, technological advancements, and socio-economic empowerment.** While challenges like agrarian distress and health infrastructure gaps persist, **India's rural growth trajectory offers hope through innovative solutions and policy support.** The synergy between government schemes, private-sector participation, and community-driven initiatives can unlock immense potential.

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Rolling out Central Bank Digital Currency in India

This editorial is based on "Rupee-backed stablecoins could complement RBI's digital currency" which was published in Mint on 26/12/2024. The article brings into focus the transformative impact of stablecoins on digital currencies, offering cryptocurrency advantages while maintaining value stability through traditional asset backing. It highlights how the emergence of the RBI's Central Bank Digital Currency (e-rupee) and rupee-backed stablecoins in India could shape a more inclusive and efficient digital financial ecosystem, provided there is adequate regulatory oversight.

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

The evolution of digital currencies has taken a significant turn with the **emergence of stablecoins**, which offer the **benefits of cryptocurrencies while maintaining value stability by being pegged to traditional assets.** In India, the landscape of digital finance is being transformed by two parallel developments: **the RBI's Central Bank Digital Currency (e-rupee)** and rupee-backed stablecoins. According to the Bank for International Settlements, digital currencies can **cut transaction costs by up to 50%,** making them an attractive option for both businesses and individuals. As India stands at this crucial juncture, the **coexistence of e-rupee and rupee-backed stablecoins** could potentially create a more inclusive and efficient digital financial ecosystem, provided there's proper regulatory oversight.

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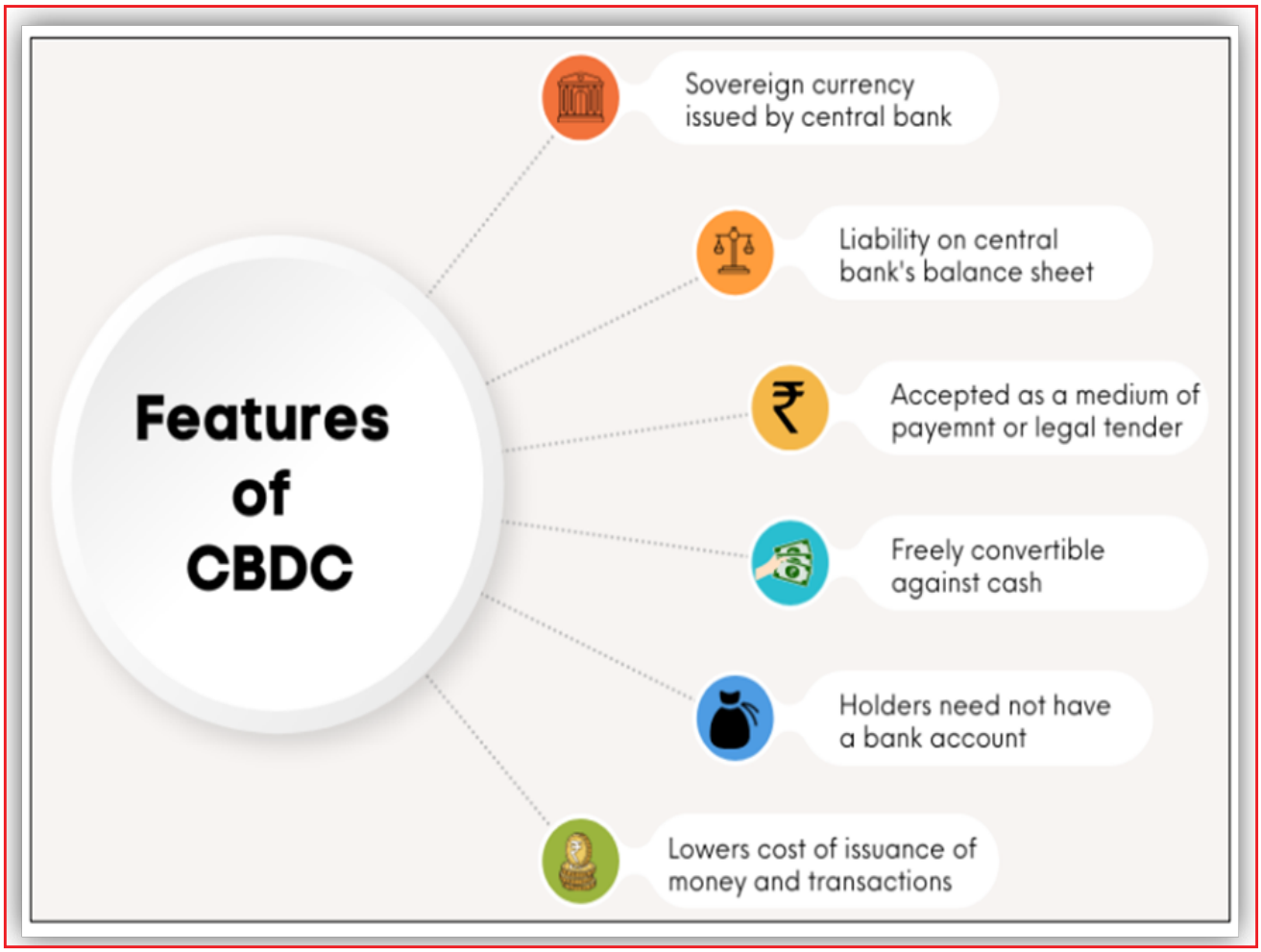

What is Central Bank Digital Currency?

- **About: Central Bank Digital Currency (CBDC)** is a digital form of a country's fiat currency, issued and regulated by the central bank.
  - It serves as a **secure, seamless, and efficient alternative to cash**, reducing costs associated with printing, distribution, and storage, while addressing risks like counterfeiting and theft.
  - CBDCs can enhance **financial inclusion, streamline cross-border payments, and support the shift towards a digital economy,** with their design tailored to minimize disruptions to the financial system.
- **Types of CBDC (e-Rupee):**
  - **Retail CBDC:** Designed for private sector users, including non-financial consumers and businesses.
    - Acts as an electronic version of cash for retail transactions.
  - **Features:**
    - Functions as a direct liability of the central bank.
    - Offers safe and secure money with 24/7 availability.
    - Facilitates real-time or near real-time payment settlements.

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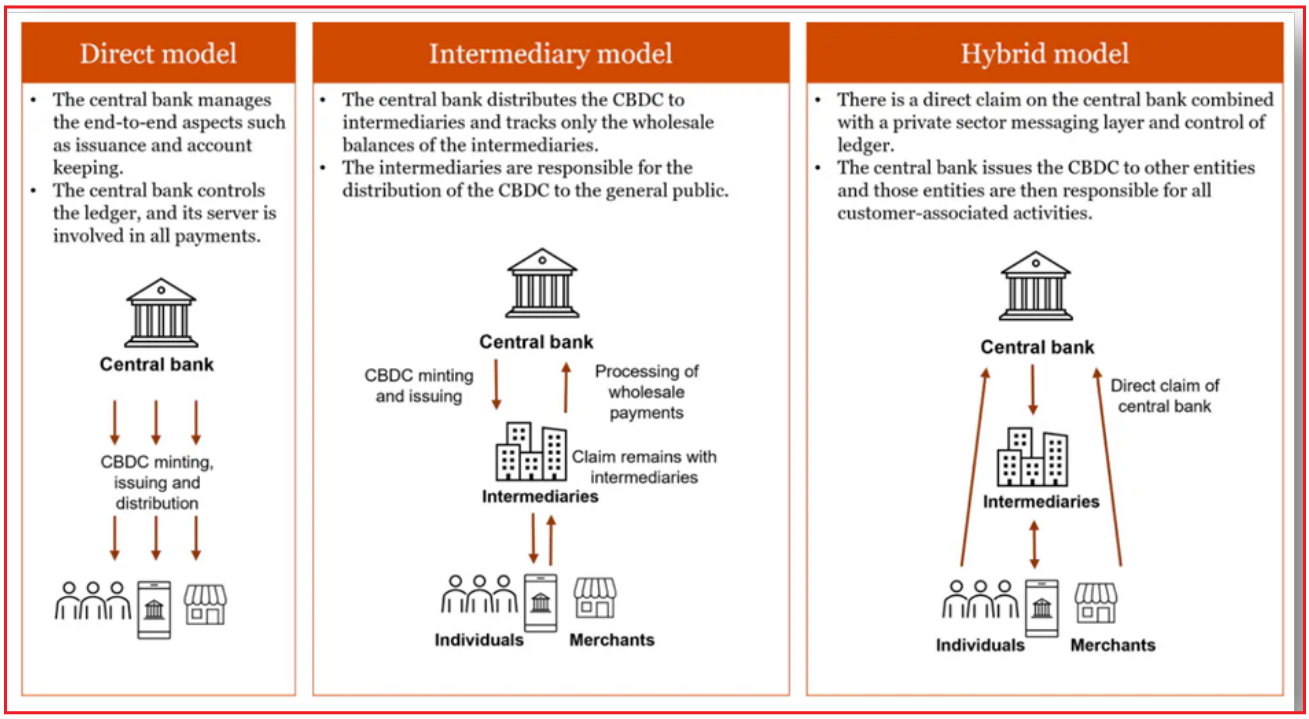
- **Wholesale CBDC**: Primarily for interbank transfers and wholesale financial transactions.
  - Used for activities like bond settlements and nostro transfers.
  - Features:
    - Restricted to select financial institutions.
    - Enhances settlement systems by improving security and efficiency.
- **Mode of Issuance:**



What are the Key Benefits of Central Bank Digital Currency?

- **Enhanced Financial Inclusion**: CBDC can provide banking services to unbanked and underbanked populations by reducing reliance on physical bank branches.
  - With **mobile-based digital wallets,** financial services can be accessed at fingertips.
  - The **RBI also proposed to introduce an offline functionality in CBDC-R** for enabling transactions in areas with poor or limited internet connectivity.
- **Reduction in Transaction Costs:** CBDCs can significantly **lower the cost of domestic cost of printing and transporting** by eliminating intermediaries.
  - Currently, for every Rs 100 note, the cost works out to be about **Rs 15-17 rupee (15-17% on each tender)** in its four-year life cycle, according to a market estimate. It can certainly be reduced with CBDC.
- **Improved Monetary Policy Implementation:** CBDCs allow central banks t**o monitor money flow in real time**, enabling precise policy measures like targeted liquidity injections.
  - This could mitigate issues like **hoarding or black-market activities,** ensuring better policy transmission.
  - The **Reserve Bank of India (RBI) in 2022 showcased its wholesale CBDC pilot (e₹-W) to better manage interbank settlements** and boost liquidity management efficiency.

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- **Enhanced Transparency and Reduced Illicit Activities:** With traceable transactions, CBDCs can curtail **corruption, tax evasion, and financial crimes** by enabling better oversight of funds.
  - The **Financial Action Task Force (FATF)** estimates that money laundering amounts to **trillions of dollars each year,** with **less than 1% of global illicit financial flows** being seized or frozen.
  - CBDCs can **help recover a significant portion through greater transparency.**
    - India's introduction of **e-invoice systems** aligns with this **anti-evasion approach.**
- **Boost to Cross-Border Payments:** CBDCs can modernize and streamline **cross-border payment systems, enabling faster, cheaper**, and more secure international transactions.
  - The **Bank for International Settlements (BIS) notes that CBDCs can reduce remittance costs.**
  - **India's G20 push on digital public infrastructure** underscores this goal, with a focus on reducing remittance costs globally by 2027.
  - The **m-CBDC Bridge Project, involving Thailand, Hong Kong, and the UAE**, has shown how CBDCs can reduce these to near-instant settlements.
- **Fostering Innovation in the Financial Sector:** The introduction of CBDCs encourages fintech innovation by creating **demand for new payment solutions and services**.
  - This ecosystem growth is visible in India, where the **UPI system inspired advancements in the E-commerce sector and Fintech.**
  - For example, CBDCs could integrate with **IoT for micropayments in smart cities**, accelerating India's smart infrastructure goals.
  - As of 2021, India has the **highest finTech adoption rate of 87%** in the world against the global average of **64%** and CBDC could further amplify this trend.
- **Economic Resilience and Crisis Management:** CBDCs offer a robust alternative during crises, such as **natural disasters or pandemics,** when physical cash may be inaccessible.
  - For instance, **digital wallets powered by CBDCs** could ensure seamless disbursement of welfare funds.
  - During Covid-19, a **significant number of global relief funds faced delays due to logistical cash issues**. A fully functional CBDC system could have expedited these transfers in real time, aligning with India's Humanitarian Aid Policies. .
- **Support for De-Dollarization:** CBDCs can reduce reliance on foreign currencies for trade and reserve management, strengthening economic sovereignty.
  - For example, **Russia's introduction of its digital ruble** is part of its strategy to mitigate dependency on the US dollar amidst sanctions.
  - In India, the **RBI's pilot efforts with wholesale CBDCs for rupee-based** cross-border trade support its aim to **internationalize the rupee,** in line with India's rupee focused trade agreements **(Rupee-Ruble Agreement)**

What are the Key Concerns Associated with CBDC?

- **Cybersecurity and Privacy Concerns:** CBDCs increase the risk of **cyberattacks on digital infrastructure,** posing a threat to national financial security.
  - **Centralized systems** are attractive targets for **hackers**, as seen in the **2020 SolarWinds cyberattack,** which impacted critical financial systems.
  - The increasing **incidents of digital arrests** and **online theft** further exacerbate the issue.
- **High Implementation and Maintenance Costs:** Developing and maintaining CBDC infrastructure requires **significant financial investment and technical expertise.**
  - These costs could **burden central banks, especially in developing countries** with limited fiscal space and competing developmental priorities.

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- For instance, the development and rollout of the eNaira reportedly cost the **Central Bank of Nigeria (CBN)** a huge chunk of money.

- **Impact on Commercial Banking System:** CBDCs could **disintermediate traditional banks** by diverting deposits to **central bank accounts,** reducing banks' ability to lend.
  - The Bank of England highlighted that the **introduction of CBDCs could lead to a reduction in bank deposits by 4% to 12%,** creating liquidity shortfalls for banks.
  - To address these challenges, **banks might be compelled to borrow from wholesale markets,** increasing their funding costs, or limit their lending activities, which could adversely impact economic growth.
- **Limited Technological Readiness:** The successful rollout of CBDCs requires robust technological infrastructure, which many countries lack.
  - **45% of the Indian population**, or about 665 million citizens, still do not access the internet as of 2023 and with only **25% digital literacy (NITI Aayog),** CBDC adoption remains a major challenge.
- **Cross-Border Regulatory Challenges:** Integrating CBDCs into cross-border payment systems faces **regulatory, technical, and geopolitical hurdles**.
  - The **lack of uniform standards for CBDC interoperability** complicates global trade.
  - For example, the **m-CBDC Bridge Project** is **completely different from digital Euro or Digital Rupee**.
- **Macroeconomic Risks and Dollarization:** In developing countries, CBDCs could **increase dollarization risks if foreign CBDCs dominate local economies.**
  - A recent study indicated that small economies may face this risk if neighboring countries adopt stronger CBDCs.
  - This could undermine monetary sovereignty, as observed in El Salvador's experience with Bitcoin adoption.

What is Rupee-Backed Stablecoins and How Can it Complement CBDC?

- **Rupee-Backed Stablecoins: Rupee-backed stablecoins are digital tokens pegged 1:1 to the Indian rupee (INR),** backed by equivalent reserves held in banks or financial institutions.
  - These stablecoins operate on blockchain technology, enabling fast and low-cost transactions, both domestically and internationally.
  - Unlike cryptocurrencies like Bitcoin, **stablecoins aim to reduce price volatility while retaining the benefits of digital currencies,** such as transparency and security. **(Examples-TrueINR**).
- **Stablecoins Complementing CBDCs:**
  - **Facilitating Cross-Border Trade and Payments:** Rupee-backed stablecoins can address cross-border payment challenges by **enabling seamless, low-cost, and faster settlements.**
    - Complementing CBDCs, stablecoins can bridge gaps in jurisdictions where CBDC interoperability or global standards are yet to develop.
  - **Promoting Innovation in the Private Sector**: Stablecoins can spur **fintech innovation by enabling programmable money solutions** for decentralized finance (DeFi) and e-commerce platforms.
    - This complements CBDCs by **serving niche use cases such as micropayments or blockchain-based trade finance,** leaving central banks to focus on systemic stability.
    - A dual system ensures flexibility and scalability in digital payments.
  - **Bridging the Digital Asset Ecosystem**: Stablecoins can act as a **bridge between traditional financial systems,** CBDCs, and the growing digital asset economy.
    - In India, where blockchain adoption is rising, **rupee-backed stablecoins could facilitate tokenized asset trading** while CBDCs handle mainstream retail and wholesale transactions.

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- **Providing Contingency in the Initial CBDC Rollout**: As CBDCs are still in the pilot phase, stablecoins can serve as a stopgap solution for digital payments.
  - They can **complement CBDCs by providing functionalities not yet covered**, such as greater anonymity or integration with global decentralized platforms.

What Measures can be Adopted to Effectively Implement CBDC in India?

- **Building Robust Digital Infrastructure:** Strengthening digital infrastructure, especially in rural areas, is critical for CBDC adoption.
  - Initiatives like **BharatNet should be accelerated to improve broadband connectivity.**
  - With only 25% of rural India digitally literate**, targeted training and infrastructure investments through Common Service Centres can bridge this gap.**
  - Collaboration with **private telecom operators** can further boost last-mile connectivity.
- **Ensuring Cybersecurity and Data Privacy:** Developing a comprehensive **cybersecurity framework is essential to protect CBDC systems** from threats.
  - Advanced **encryption technologies and AI-based monitoring systems** should be implemented to safeguard digital transactions.
  - The **RBI can collaborate with CERT-In** to establish real-time threat detection mechanisms.
- **Integrating with Existing Financial Ecosystems: CBDCs should complement, not disrupt, the current banking and payments systems**.
  - A **tiered CBDC model can be introduced,** with commercial banks acting as intermediaries for distribution and account management.
  - The RBI's current pilot, **leveraging UPI for retail CBDC transactions,** demonstrates how existing platforms can ensure seamless integration.
  - For instance, **linking CBDCs with Aadhaar and Jan Dhan accounts** can enhance financial inclusion. Such integration reduces redundancy and optimizes resource utilization.
- **Promoting Public Awareness and Education:** A comprehensive awareness campaign is necessary to educate citizens about CBDC benefits and usage.
  - The **RBI and National Payments Corporation of India (NPCI) can collaborate on workshops, online modules,** and community programs to enhance understanding.
  - For instance, India's successful campaign for **digital payment adoption through DigiDhan Melas** can be replicated.
- **Creating Offline CBDC Capabilities:** Developing robust offline functionality for CBDCs can ensure access in areas with poor or no internet connectivity.
  - Technologies such as **NFC-enabled smart cards or mobile wallets** can facilitate offline transactions.
  - The **RBI's offline retail CBDC trials** are a step in the right direction. This measure will ensure inclusivity and resilience in the CBDC ecosystem.
- **Establishing Interoperability Standards:** CBDCs must be **designed to be flexible and interoperable** with existing payment systems across the globe and potential international CBDC frameworks.
  - The **G20's roadmap on cross-border payments** emphasizes the need for global standards; India can lead efforts in aligning its CBDC with these standards.
- **Developing a Transparent Legal and Regulatory Framework:** A clear legal framework is necessary to address issues like **liability, taxation, and consumer protection in CBDC transactions.**
  - **A common "CBDC Design Principles" by World Bank or BIS** can serve as benchmarks for regulatory policies.
  - India's Personal Data Protection Act 2023 should be integrated into the CBDC framework to safeguard privacy.
    - Such clarity will provide legal certainty and enhance stakeholder confidence.
- **Leveraging Public-Private Partnerships (PPPs):** Engaging private players in CBDC development and implementation can foster innovation and reduce costs.
  - For instance, **fintech companies can help design user-friendly applications** and payment solutions.
  - Collaboration with **blockchain startups can also enhance security and operational efficiency.** PPPs ensure scalability and keep implementation aligned with market needs.

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Strengthening India's Disaster Safety Net

This editorial is based on "Two decades after the Indian Ocean tsunami: reflecting on a global turning point in disaster management" which was published in Times of India on 25/12/2024. The article brings into picture India's transformation in disaster management since the 2004 Indian Ocean Tsunami, highlighting its evolution into a regional leader through initiatives like the Disaster Management Act of 2005.

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

Nearly **2 decades after the devastating 2004 Indian Ocean Tsunami,** which claimed over 230,000 lives, India has transformed its **disaster management approach.** Through the **Disaster Management Act of 2005**, it established the National Disaster Management Authority and the **National Disaster Response Force,** evolving from a victim to a regional leader. Yet, with its vast coastline, diverse geography, and growing climate vulnerabilities, persistent challenges remain, demanding **continuous vigilance and advancements in disaster response mechanisms.**

How has the Approach to Disaster Management Evolved in India?

- **Early Years: Relief-Centric and Reactive Approach (Pre-1980s)**
  - **Focus on Relief and Rehabilitation:** In the initial years post-independence, disaster management was limited to reactive relief efforts, such as **food distribution, temporary shelters, and medical aid.**
    - The responsibility primarily lay with state governments, supported by central assistance during major calamities.
    - Events like the **Bihar famine (1966-67)** and **Drought of 1972** revealed inefficiencies in relief distribution and lack of preventive measures.
- **Shift Toward Planning and Preparedness (1980s-2000s)**
  - **Increased Institutional Focus:** The establishment of the **Department of Environment (1980),** later the Ministry of Environment and Forests, addressed disaster-linked environmental concerns.
  - **Response to Major Events:** The **Bhopal Gas Tragedy (1984),** one of the worst industrial disasters, highlighted the need for stricter safety regulations and disaster management in industries.
    - **Cyclones in Andhra Pradesh (1990)** and **Latur Earthquake (1993)** led to improvements in relief coordination, but prevention and mitigation remained limited.
  - **Formation of National Organizations:** In 1990, the **Cyclone Warning Directorate was established in New Delhi** to coordinate cyclone warning activities across the country and serve as the **Regional Specialized Meteorological Centre-Tropical Cyclones (RSMC-TC)** for providing regional guidance.
- **Institutionalization of Disaster Management (2000s)**
  - **Key Disasters as Turning Points:** The **Bhuj Earthquake (2001)** exposed vulnerabilities in urban planning and infrastructure safety, prompting systemic reforms in preparedness.
    - The **Indian Ocean Tsunami (2004)** caused massive devastation, leading to a paradigm shift in India's disaster management strategies.
  - **Enactment of the Disaster Management Act (2005):** The Act institutionalized disaster management in India, creating a dedicated framework.
    - The **National Disaster Management Authority (NDMA)** was established, with **state (SDMAs) and district (DDMAs) counterparts.**

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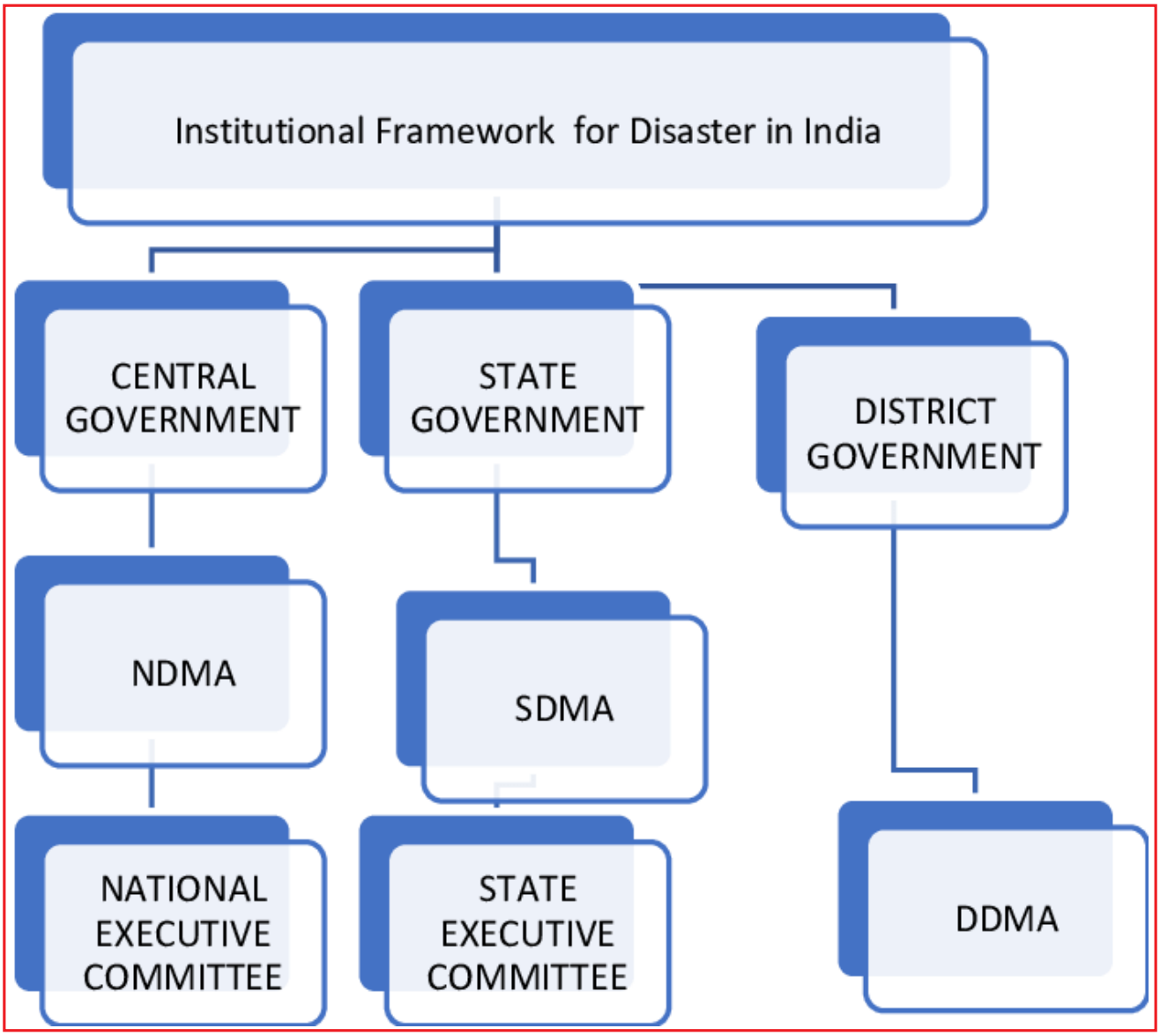
- The focus shifted to the four pillars of disaster management: mitigation, preparedness, response, and recovery.



➢ **Proactive and Resilience-Focused Approach (2010-Present)**

- **Shift to Mitigation and Resilience:** Emphasis on risk reduction under global frameworks like the **Hyogo Framework for Action (2005-2015)** and **Sendai Framework for Disaster Risk Reduction (2015-2030).**
- **Adoption of Technology:** Advanced systems like **Doppler Radar,** **flood forecasting** and real-time data sharing platforms.
- **Community-Centric and Inclusive Strategies:** Programs like **Aapda Mitra** and school disaster management plans empower local communities to act as first responders.
- **Global Collaborations:** India contributes to and benefits from global frameworks such as **SAARC Disaster Management Centre** **and the** **United Nations Office for Disaster Risk Reduction.**
  - Participation in **Coalition for Disaster Resilient Infrastructure** **(CDRI)** to develop resilient infrastructure

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- **Evolving Focus Area:**
  - **Addressing Climate-Induced Disasters:** India incorporated climate resilience into disaster management plans due to increasing climate-related risks.
    - Focus on **nature-based solutions like mangrove restoration** under programs like **Namami Gange** to mitigate flooding.
  - **Urban Disaster Management:** Integration of urban resilience into development frameworks under the **Smart Cities Mission** to address risks like urban flooding.
    - **Bengaluru's flood management plans post-2022** floods emphasize wetland restoration and stormwater infrastructure upgrades.

What are the Major Disaster Challenges Confronting India?

- **Escalating Climate-Induced Disasters:** India is experiencing an increasing frequency of **extreme weather events** due to climate change, exposing gaps in mitigation frameworks.
  - **Cyclone Mocha (2023) impacted Sundarbans**, while record-breaking rainfall in Himachal Pradesh (2023) caused over **₹10,000 crore in losses,** exacerbated by deforestation and unregulated development.
  - A recent study revealed that **India faced extreme weather events on 314 out of 365 days in 2023**.
    - The **lack of climate-resilient infrastructure** amplifies both human and economic vulnerabilities.
- **Urban Flooding as a Result of Chaotic Urbanization:** Rapid urban expansion without sustainable planning has turned cities into flood hotspots.
  - Rapid urbanisation intensifies the challenge of urban flooding, leading to peak water levels **rising 1.8 to 8 times in developed cities.**
  - **Chennai's 2021 floods**, caused by outdated drainage systems and illegal construction on wetlands, disrupted life and led to economic losses.
  - The **2022 Bengaluru floods were largely due to rampant corruption in the civic body,** resulting in extensive encroachments on lakes, lake beds, storm-water drains (**rajakaluves**), and buffer zones.
- **Himalayan Fragility and Glacial Retreat:** Melting glaciers and unstable Himalayan geology are leading to high-magnitude disasters like landslides and glacial lake outbursts.
  - The **Kedarnath flood (2013) and the Chamoli disaster (2021)** highlighted cascading risks due to unchecked hydropower projects and deforestation.
  - From 1975 to 2000, Himalayan glaciers lost an average of 4 billion tonnes of ice annually, which **doubled to 8 billion tonnes per year between 2000 and 2016.**
  - This endangers not just livelihoods but also water security for millions downstream.
- **Industrial Hazards and Rising Chemical Disasters:** India's lax enforcement of industrial safety norms has resulted in repeated industrial accidents.
  - The **Vizag gas leak (2020)** exposed over 10,000 people to toxic fumes, while the **Ludhiana gas tragedy (2023)** highlighted the lack of real-time monitoring of hazardous materials.
  - Government data reveals that an average of **3 workers lose their lives daily in Indian factories** due to inadequate safety measures yet implementation of **NDMA's chemical disaster guidelines** remains fragmented, especially in **Tier-2 and Tier-3 cities.**
- **Agricultural Vulnerabilities and Drought Risks:** Erratic monsoons, heatwaves, and groundwater depletion have worsened drought conditions, crippling **India's agrarian economy.**
  - The **2022 Latur drought** saw crop failures. More than **60% of the people in Latur** are engaged in agriculture, making drought a serious issue
  - **40% of Indians will have no access to drinking water by 2030** (NITI Aayog). Despite schemes like **PMKSY (Pradhan Mantri Krishi Sinchayee Yojana),** irrigation infrastructure and rainwater harvesting remain inadequate.

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- **Forest Fires and Loss of Carbon Sinks:** Forest fires in India are increasing both in frequency and intensity due to climate change and human-induced factors.
  - The **India State of Forest Report (ISFR) 2023**, revealed that Uttarakhand alone recorded **5,351 forest fires** between **November 2022 to June 2023.**
  - The **Simlipal fires in Odisha (2021)** lasted for over 10 days, affecting close to one-third area.
- **Health Crises Following Disasters:** Disasters exacerbate **public health emergencies,** with disrupted sanitation, contaminated water supplies, and weakened healthcare systems.
  - For instance, after the **2018 Kerala floods**, waterborne diseases increased, with **leptospirosis** and **cholera** being the most common.
  - Limited deployment of mobile health units and slow response times highlight glaring gaps in disaster healthcare infrastructure.
- **Weak Early Warning Systems and Coordination Failures:** Although technological advancements have improved forecasting, gaps in last-mile connectivity remain critical.
  - A **2023 World Meteorological Organization (WMO) report** highlighted that **India ranked 14th out of 21 countries** in early warning system effectiveness, with below-average scores in risk knowledge, observation, forecasting, warning, dissemination, and preparedness.
- **Gendered and Social Inequities in Disasters:** Disasters amplify existing social vulnerabilities, with women, children, and marginalized groups disproportionately affected.
  - For example, following cyclones like Amphan and Yaas, **women and children in affected areas were targeted by traffickers,** and social inequalities worsened as communities struggled with recovery.
- **Gaps in Institutional Frameworks and Funding:** India's disaster management frameworks remain **reactive rather than proactive,** with insufficient funding for mitigation efforts.
  - A total of ₹68,463 crore has been allocated for the NDRMF from 2021-22 to 2025-26, with 80% for the National Disaster Response Fund **leaving just 20% for the National Disaster Mitigation Fund.**
  - Weak institutional accountability and fragmented policies hinder effective disaster risk reduction and resilience-building.

What Lessons India Can Learn from Other Countries in Disaster Management?

- **Japan's Earthquake Preparedness:** Japan's **strict building codes, retrofitting of infrastructure, and regular earthquake drills** ensure minimal casualties during seismic events.
  - India can adopt similar seismic safety norms in high-risk zones like the Himalayas.
- **Bangladesh's Cyclone Management: Bangladesh's** efficient evacuation strategies drastically reduced cyclone-related fatalities. India can improve community-based disaster planning in coastal regions.
- **Netherlands's Flood Management:** The Netherlands has a network of **dikes, dams, and floodgates** to protect against storm surges from the sea.
  - India's urban flood management can benefit from replicating these solutions in cities like Mumbai and Chennai.
- **South Korea's Technological Integration:** South Korea uses integrated digital platforms for disaster response coordination across agencies. India can adopt centralized command systems for better inter-agency coordination.
- **Sweden's Climate Adaptation:** Sweden's proactive climate adaptation policies include integrating disaster risk reduction with urban planning.
  - India can align its **Smart Cities Mission** with climate resilience strategies.

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What Measures can India Adopt to Enhance Disaster Resilience and Mitigation?

- **Strengthening Climate-Resilient Infrastructure:** India needs to invest in climate-resilient infrastructure that can withstand extreme weather events such as **cyclones, floods, and heatwaves.**
  - Developing **green buildings, flood-resistant urban drainage systems**, and cyclone-proof housing in coastal areas is essential.
  - For example, **Odisha's cyclone shelter**s have saved countless lives, a model that can be replicated nationwide.
  - Integrating the **Smart Cities Mission with climate-resilience planning** can ensure urban growth aligns with disaster mitigation goals.
- **Implementing Community-Based Disaster Risk Reduction (CBDRR):** Local communities must be empowered to manage risks through **training, capacity building, and disaster preparedness exercises.**
  - Combining Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) with **community-led hazard mapping** can create sustainable assets like embankments and check dams.
- **Integrated Water Resource Management (IWRM) to Combat Urban and Rural Flooding:** A unified approach to water management can address flooding and drought challenges simultaneously.
  - This includes restoring **wetlands**, building **urban rainwater harvesting systems,** and strengthening embankments along rivers.
  - Integrating **Namami Gange with city-level flood prevention plans** can address urban flooding while enhancing river health.
- **Modernizing Early Warning Systems with Technology:** India must adopt advanced technologies like **AI, IoT, and geospatial mapping** to modernize early warning systems.
  - Expanding the scope of the **Common Alerting Protocol (CAP)** to integrate **mobile alerts with local language support** can enhance last-mile communication.
  - Leveraging **ISRO's satellite capabilities** to monitor high-risk zones, combined with **AI-powered models**, can reduce response times.
- **Retrofitting Seismic Zones and Enforcing Building Codes:** India needs to enforce stringent compliance with **seismic safety code**s, especially in urban areas and high-risk zones like the **Himalayas**.
  - **Retrofitting old structures,** particularly schools and hospitals, can minimize casualties during earthquakes.
  - Linking such efforts with **Pradhan Mantri Awas Yojana (PMAY)** can ensure affordable housing adheres to disaster-resilient norms.
- **Scaling Up Insurance Coverage for Disaster Losses:** Developing microinsurance schemes tailored to **farmers, small businesses, and vulnerable populations** can mitigate financial losses post-disasters.
  - Linking crop insurance under the **Pradhan Mantri Fasal Bima Yojana (PMFBY)** with parametric insurance models for faster payouts can provide timely relief.
  - Integrating **disaster insurance into the financial inclusion agenda under Jan Dhan accounts** can ensure wide coverage, especially in rural areas prone to recurrent disasters.
- **Strengthening Urban Disaster Preparedness via Smart Cities Mission:** Urban centers must prioritize integrating disaster management into their development plans.
  - **Cities under the Smart Cities Mission** can be mandated to adopt risk-sensitive zoning and automated weather monitoring systems.
  - For example, **Surat's early flood-warning system reduced** damages during monsoons.
  - Collaborating with startups under the Startup India scheme can foster innovation in **urban disaster resilience technologies**.

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- **Integrating Climate Change Mitigation with Disaster Risk Management:** India must align its climate change mitigation strategies with disaster resilience efforts by adopting nature-based solutions.
  - A recent study found mangroves **reduce flood damage by $65 billion globally each year.** Implementing **mangrove restoration programs** in coastal areas, as in Sundarbans, can reduce cyclone impacts while sequestering carbon.
- **Institutional Capacity Building and Unified Response Systems:** Streamlining coordination among institutions like **NDMA, SDRFs, and local governments** can ensure a faster response during disasters.
  - Establishing **unified command centers** equipped with real-time data analytics can enhance coordination.
  - Linking National Disaster Response Force (NDRF) operations with tech platforms like **GIS-based planning tools** can further improve efficiency.
- **Gender-Inclusive Disaster Policies for Equitable Recovery:** Disaster policies must incorporate **gender-sensitive approaches** to address the unique vulnerabilities faced by women and marginalized groups.
  - Integrating **women-led self-help groups (SHGs) under the Deendayal Antyodaya Yojana** into **disaster relief and recovery efforts** can ensure inclusive outcomes.
- **Creating a Transboundary Disaster Management Framework:** India should collaborate with neighboring countries to **develop transboundary mechanisms for shared disaster risks.**
  - Regional cooperation with **China and Bangladesh** can enhance cyclone preparedness in the Bay of Bengal.
  - Integrating transboundary mechanisms into the **SAARC Disaster Management Center's initiatives** can create a regional safety net.
- **Institutionalizing Disaster Education and Awareness:** Incorporating disaster preparedness education into school curriculums can build a culture of safety from a young age.
  - Programs like the **Aapda Mitra scheme** for disaster volunteers can be expanded to **rural schools to train students in basic response techniques.**
  - Linking **disaster education through Social Media influencers** can amplify outreach.

Conclusion:

The implementation of the **Disaster Management Act of 2005**, along with the incorporation of the **Sendai Framework for Disaster Risk Reduction,** has significantly strengthened national preparedness. However, challenges such as climate-induced disasters, urban flooding, and industrial hazards persist. India's approach to disaster management needs to be evolved from a **reactive, relief-focused model to a proactive, resilience-driven framework.**

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Reviving India's Forests

This editorial is based on "Canary in the canopy: on the India State of Forest Report 2023" which was published in The Hindu on 24/12/2024. The article brings into picture the complexities behind India's forest cover, reported at 25% of the total land area. While seemingly positive, it masks deeper concerns like development pressures, rising fires, and inadequate resources for conservation.

Tag: GS Paper - 2, GS Paper - 3, Conservation, Issues Relating to Development, Management of Social Sector/Services, Forest Resources

India's forest cover, reportedly at **25% of the total land area** according to the State of Forest Report 2023, is seen as a positive development, but critics argue that it masks underlying concerns **in forest health and management.** While post-independence laws like the Forest Conservation Act 1980 and Forest Rights Act 2006 aimed at reforming colonial policies, their implementation has faltered due to development pressures and climate change**. Rising forest fires, limited conservation resources, and weakening protections** further threaten forest ecosystems. A holistic approach with accurate reporting, better resource-use, and community involvement is crucial for safeguarding India's forests.

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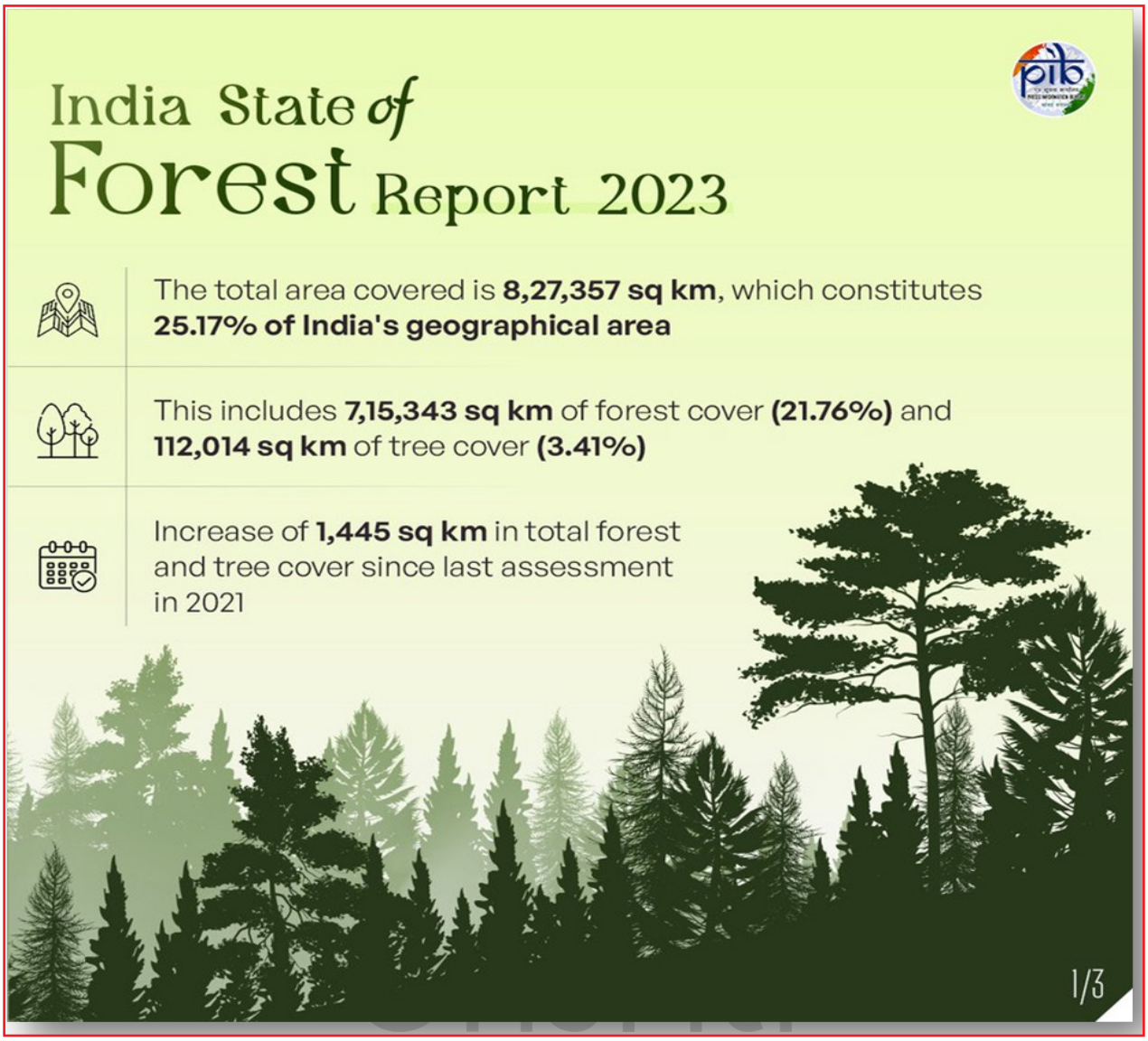

What Role do Forests Play in Driving India's Economy and Supporting Nation Development?

- **Livelihoods and Employment Generation:** In India, the **Forest Survey of India (2019)** estimated, roughly **26% of the total 650,000 villages** can be classified as forest fringe villages, where forests fulfill significant socio-cultural and livelihood needs
  - For instance, forest-based industries such as paper, pharmaceuticals, and handicrafts significantly contribute to employment.
- **Climate Regulation and Carbon Sequestration:** India's forests play a critical role in mitigating climate change by **sequestering millions of tonnes of CO_2 annually**.
  - This supports India's commitment to achieving **net-zero emissions by 2070** and creating carbon credits.
  - Recent afforestation initiatives under the **Green India Mission** have targeted the restoration of **26 million hectares** of degraded land.

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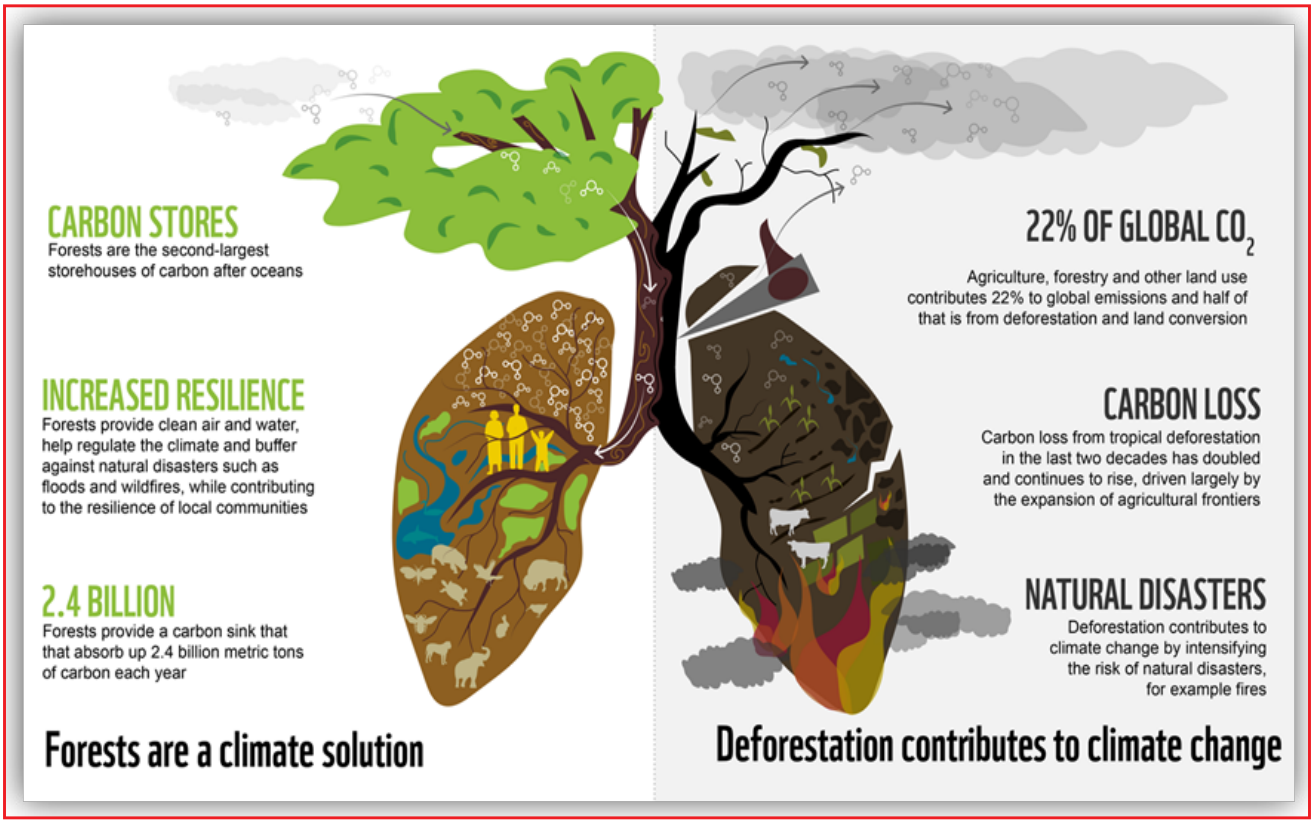
- **Economic Contribution Through Timber and Industry:** The forestry sector contributes **1.7% to India's GDP**, supporting industries like furniture, construction, and paper manufacturing.
  - The **National Agroforestry Policy (2014)** has facilitated the planting of fast-growing species like **eucalyptus,** benefiting industries and enhancing rural incomes.
- **Biodiversity and Ecotourism:** Forests harbor the **majority of India's terrestrial biodiversity**, supporting ecotourism and conservation-linked livelihoods.
  - For example, tiger reserves like **Ranthambore and Corbett** attract millions of tourists annually.
  - The **Project Tiger initiative** has doubled the tiger population to **3925 in 2023**, boosting India's global conservation image.
  - This biodiversity also supports ecosystem services like **pollination, crucial for agriculture and food security.**
- **Renewable Energy and Biomass Utilization:** Forests provide biomass energy, supporting India's renewable energy transition.



  - The **National Bio-Energy Mission** promotes the sustainable use of forest residues, helping achieve the **500 GW renewable energy target by 2030**.
  - Forest residues are also being utilized for biofuel production under initiatives like the **SATAT scheme**.
- **Watershed and Soil Conservation:** Forests help control the water cycle by regulating precipitation, evaporation, flows and prevent soil erosion, ensuring agricultural productivity.
  - Forested watersheds contribute to critical river systems like the **Indus, Ganga and Brahmaputra,** supporting **700 million people**.

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- **Cultural and Spiritual Significance:** Forests hold immense cultural and spiritual value in India, deeply rooted in traditions and practices like worshiping sacred groves (e.g., **Khasi Sacred Forest in Meghalaya).**
  - This helps preserve biodiversity hotspots and promotes eco-friendly tourism.
  - For example, the **Chipko Movement** remains a testament to the intertwined relationship between forests and cultural heritage.
- **Disaster Mitigation and Resilience:** Forests act as natural barriers against disasters like cyclones, floods, and landslides, saving billions in economic losses annually.
  - Mangroves in **Bhitarkanika, Odisha**, shielded against **Cyclone Dana's impact,** demonstrating their crucial role in storm surge protection.
  - The **Mangrove Initiative for Shoreline Habitats and Tangible Incomes (MISHTI)** underlines their role in sustainable development.

What are the Major Threats to the Sustainability of India's Forests?

- **Deforestation and Land-Use Change:** India's forests are under immense pressure from deforestation driven by **settlement expansion and infrastructure projects.**
  - Government data reveals a loss of **1,488 sq km of 'unclassed forests'** (non-notified forests under government ownership) between 2021 and 2023, and critics argue that there is **no explanation provided in ISFR 2023 for the same.**
  - For instance, the **Hasdeo Arand coal mining project in Chhattisgarh** has sparked protests over the loss of biodiversity-rich forests.
    - Such changes irreversibly degrade ecosystems and reduce forest sustainability.
- **Climate Change and Forest Fires:** Rising global temperatures and erratic rainfall patterns make Indian forests more vulnerable to fires and drought.
  - A recent analysis by the FSI of **forest fires** across **705 protected areas** in India revealed **6,046 incidents in national parks this season.**
  - **Papikonda National Park in Andhra Pradesh** recorded the highest number of cases, followed by **Indravati National Park in Chhattisgarh** and **Manas National Park in Assam.**
- **Illegal Logging and Timber Smuggling:** Illegal logging depletes high-value tree species like teak and sandalwood, threatening biodiversity and disrupting ecosystems.
  - For example, **red sanders smuggling in Andhra Pradesh** has led to deforestation in protected areas.
    - Despite stricter forest laws, limited enforcement and porous borders exacerbate this issue.
  - Also, **India has become a net importer of timber** with the country imported over **$2.7 billion worth of timber in 2023**
- **Encroachment and Habitat Fragmentation:** Encroachment for agriculture and allied activities fragments forests and disrupts wildlife corridors.
  - Over **3 lakh hectares of forest land** has been diverted for non-forestry use in India over the last 15 years under the **Forest (Conservation) Act, 1980**
  - Infrastructure projects like the **Char Dham road project** have fragmented critical **Himalayan ecosystems,** endangering species like the snow leopard and red panda.
- **Overexploitation of Non-Timber Forest Products (NTFPs):** Excessive harvesting of NTFPs such as **bamboo, tendu leaves, and medicinal plants** undermines forest regeneration.
  - This threatens both **biodiversity and livelihoods.** The **depletion of sandalwood forests in Karnataka**, for example, has impacted the local fragrance industry.
- **Rise of Invasive Species:** The spread of invasive alien species like ***Prosopis juliflora*** is reducing the health and biodiversity of India's forests.
  - For instance, ***Lantana camara***, which was introduced by the British, has now become one of the most invasive plants in India, **covering 40% of the tiger range.**
  - These species outcompete native plants, as seen in **Rajasthan's Keoladeo National Park**.

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- **Human-Wildlife Conflicts:** Forest fragmentation has increased **human-wildlife conflicts**, affecting both human lives and conservation efforts.
  - Between 2019 and 2024, **elephant attacks in India resulted in 2,727 fatalities,** while tiger attacks claimed 349 lives.
  - For instance, Man-animal conflict in Bengaluru leads to casualties among humans and animals, prompting the formation of a **Leopard & Elephant Task Force.**
- **Weak Enforcement and Governance:** Ineffective enforcement of forest laws and delayed implementation of policies undermine sustainable forest management.
  - Despite the **Compensatory Afforestation Fund Act (2016)**, in 2021-22, only 48% of the approved funds were utilised under Compensatory Afforestation Fund Management and Planning Authority.
  - The **Forest Rights Act (2006)** also remains poorly implemented,a significant number of **claims rejected** due to bureaucratic hurdles.
  - Also, recent amendments to the **Forest Conservation Act, 1980**, have ignited a contentious legal debate over India's framework for forest protection.
- **Pollution and Ecosystem Degradation:** Pollution from industrial and urban activities reduces forest soil fertility and water quality, impacting forest ecosystems.
  - According to the CWC report, **141 out of 328 river monitoring stations** in India **(43%)** recorded alarming concentrations of one or more toxic heavy metals between January and December 2022.
  - In regions like the **Western Ghats, acid rain** from industrial emissions is reducing the regenerative capacity of forests, endangering biodiversity hotspots.
- **Overgrazing by Livestock:** Uncontrolled grazing in forested areas reduces natural vegetation and affects regeneration, particularly in arid and semi-arid zones.
  - The **Thar Desert region** faces degradation due to overgrazing. Additionally, forest-dependent pastoralists struggle with declining resources, increasing pressure on fragile ecosystems.
  - Programs like the **National Livestock Mission** lack effective grazing management plans.
- **Unsustainable Tourism Practices:** Mass tourism in ecologically sensitive areas increases pollution and disrupts wildlife.
  - Popular tourist destinations like **Corbett Tiger Reserve** and **Kaziranga National Park** face issues like vehicle pollution and habitat degradation due to unregulated tourism.

What Measures can be Adopted to Enhance Forest Conservation in India?

- **Strengthening Forest-Based Livelihoods:** Promoting sustainable forest-based livelihoods can align economic needs with conservation goals.
  - Initiatives like **Van Dhan Vikas Yojana** have shown success by training tribal communities to process and market non-timber forest products (NTFPs).
  - Expanding such programs to include agroforestry and ecotourism can reduce dependency on deforestation.
- **Expanding Community Participation:** Involving local communities in conservation efforts through **Joint Forest Management (JFM)** and the **Forest Rights Act (2006)** can enhance sustainable practices.
  - Encouraging collective efforts like **Forest Protection Committees (FPCs)** ensures ownership and better enforcement.
  - For example, **JFM in Madhya Pradesh has restored over 1.2 million hectares** of degraded land, proving the efficacy of participatory models.
    - Expanding this model nationally can yield long-term results.
- **Promoting Afforestation and Reforestation:** Programs like the **Green India Mission** and commitments under the **Bonn Challenge** should focus on **afforestation using native species to ensure biodiversity restoration.**

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- India has pledged to restore **26 million hectares** of degraded land by 2030, which can be accelerated by integrating these efforts with local employment schemes like **MGNREGA**.
- Recent success in Tamil Nadu, where **375 ha hectares of mangroves** were restored, showcases the scalability of such efforts.

- **Enforcing Stricter Anti-Encroachment Measures:** Strengthening enforcement against encroachment through satellite monitoring and digital databases can protect critical forest areas.
  - The **Forest Survey of India (FSI)** already uses geospatial tools to monitor deforestation, which can be expanded to track illegal activities in real time.
  - For instance, in Assam, geospatial monitoring helped reclaim over **1,500 hectares** of encroached land in **Kaziranga National Park**.
    - Scaling such technology nationwide can curb habitat loss.
- **Leveraging Technology for Conservation:** Adopting technologies like **LiDAR (Light Detection and Ranging)**, drones, and AI-based monitoring systems can ensure efficient forest management.
  - The **National Remote Sensing Centre (NRSC)** is already using satellite imagery for forest mapping, which can be expanded for real-time tracking of forest fires and illegal logging.
  - For example, **LiDAR-based mapping in the Western Ghats** has identified critical biodiversity zones for targeted conservation.
- **Incentivizing Private Sector Participation:** Encouraging private players to invest in afforestation projects through **Corporate Social Responsibility (CSR)** and carbon offset markets can enhance conservation funding.
  - The **Compensatory Afforestation Fund Management (CAMPA)** can be streamlined to integrate corporate partnerships.
  - For instance, **Reliance Industries' partnership with Gujarat for mangrove restoration** highlights how public-private models can deliver results.
    - Clear guidelines for **carbon credit trading** will attract more investments.
- **Integrating Agroforestry and Sustainable Agriculture:** Promoting agroforestry practices under the **National Agroforestry Policy (NAP)** can reduce deforestation for agriculture while increasing farmers' incomes.
  - Agroforestry models combining trees with crops like **millets or oilseeds can enhance soil health and carbon sequestration.**
  - **Karnataka's success in promoting agroforestry** benefits both biodiversity and rural economies.
- **Addressing Invasive Species:** Systematic removal and control of invasive alien species like Lantana camara and Prosopis juliflora should be prioritized through public-private partnerships.
  - Programs like the **National Biodiversity Action Plan (NBAP)** can be enhanced to focus on invasive species management.
  - Rajasthan's forestry officials turn to **NREGA** for assistance in removing invasive **juliflora**. Expansion of such campaigns can improve forest health nationwide.
- **Climate-Resilient Forest Management:** Climate-adaptive forest management practices, including **planting drought-resistant species** and promoting water conservation, should be prioritized.
  - Programs like the **Catch the Rain initiative** can be integrated with forest conservation efforts to improve water availability in forested areas.
- **Developing Eco-Tourism Models:** Promoting sustainable eco-tourism can generate revenue for conservation while creating awareness about biodiversity.
  - States like **Kerala and Uttarakhand have pioneered eco-tourism projects** that balance economic benefits with forest preservation.
  - For example, Kerala's **Thenmala Eco-Tourism Project** supports local livelihoods. Expanding such models across biodiversity hotspots can enhance forest sustainability.
- **Strengthening Legal Frameworks and Governance:** Amending the **Indian Forest Act (1927)** and the **Wildlife Protection Act (1972)** to address emerging challenges like **illegal logging, invasive species, and climate change** impacts can strengthen conservation efforts.

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- The implementation of **CAMPA funds**, of which only **33% had been utilized as of 2022**, needs stricter accountability mechanisms.
- Improved coordination between forest departments and local governments can bridge enforcement gaps.

➢ **Enhancing Biodiversity Corridors:** Developing forest corridors between fragmented habitats can reduce human-wildlife conflicts and preserve biodiversity.
- Projects like the **National Wildlife Corridors Project** should be expanded to include all critical tiger and elephant reserves.
- For instance, the **restoration of the Kaziranga-Karbi Anglong corridor** reduced wildlife stress and human conflicts, demonstrating the effectiveness of such measures.

Conclusion:

India's forests are pivotal to its **ecological balance, economic growth, and cultural heritage.** While significant progress has been made in enhancing forest cover, **challenges such as deforestation, climate change, and weak enforcement demand urgent attention**. A multi-faceted approach focusing on **sustainable livelihoods, community participation, technological integration**, and stricter governance can ensure the long-term health of forest ecosystems.

■■■

Gender-Sensitive Policy Making

This editorial is based on "Gender sensitive policing needed" which was published in Hindustan Times on 29/12/2024. The article highlights the Madras High Court's criticism of the Tamil Nadu Police in the Anna University case highlights gaps in gender-sensitive policing, with victim-blaming and privacy violations reflecting broader issues of gender sensitization and female representation in law enforcement.

Tag: GS Paper - 1, Women's Issues, Role of Women, GS Paper - 2, Gender Equality, Issues Related to Women, Government Policies & Interventions, Public Policy.

Gender-sensitive policy making recognizes and addresses the specific and often unequal impacts of policies on different genders, especially in societies where historical and systemic inequalities persist. In India, the urgency for such policies has been highlighted by incidents like the Anna University sexual assault case, where **institutional insensitivity** exacerbated the trauma faced by survivors. The failure to provide adequate support and **justice** reflects broader societal challenges, underscoring the critical need for a transformative approach. **Gender-sensitive policies** not only aim to rectify immediate disparities but also work as **foundational tools** for achieving sustainable **socio-economic and cultural equity** over time by creating **equitable frameworks** .

Why is Gender-Sensitive Policy Making Necessary?

➢ **Persistent Gender Disparities:**
- **Female Labor Force Participation**: The Economic Survey 2023-2024 observes that the female Labour Force Participation Rate (LFPR) rose to **37%** in 2022-2023 from **23.3%** in 2017-2018 which is relatively below global and regional benchmarks such as China's 61.5%.
  - This restricts **women's economic independence** and undermines national productivity.
- **Wage Inequality**: As per the Gender Gap Index, India's economic parity stands at **39.8%**, meaning women earn **Rs 39.8** for every **Rs 100** earned by men. However, India has closed **64.1%** of its **gender gap** in 2024.
  - The wage gap devalues women's work, leading to economic dependency and limiting investment in **education, healthcare, and development**.
- **Educational Gaps**: Despite significant progress in improving literacy rates among women, systemic barriers persist that hinder girls from accessing higher education.
  - Also, despite India producing the highest percentage of women STEM (science, technology, engineering, and mathematics) graduates globally (40%), their representation in STEM jobs remains low at just **14%**, according to the CSIR report 2022.

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- Factors such as **poverty**, inadequate **infrastructure in rural areas**, and societal norms that prioritize male education over female, exacerbating gender inequities.

❍ **Political Underrepresentation**: In the **18th Lok Sabha**, 74 women were elected, making up **13.6%** of the total, a slight decrease from 78 women (14.4%) in the **17th Lok Sabha**, reflecting their marginal presence in the nation's highest decision-making body.

- This underrepresentation in politics leads to inadequate advocacy for **women-centric policies** and diminishes the diversity of perspectives needed for comprehensive governance.

➢ **Socio-Cultural Barriers:**

❍ **Patriarchal Norms**: Deep-rooted **patriarchal attitudes** constrain women's mobility, decision-making power, and access to critical resources.

- For example, around 47% of Indian women report having a say in **household financial decisions**, illustrating the pervasive nature of gendered power imbalances within families and communities.

❍ **Intersectional Discrimination**: Women from marginalized communities, such as Dalits and Muslims, face **compounded challenges** that intertwine gender, caste, and religious biases.

- For instance, according to the **2011 Census**, the worker population ratio of Muslims was 32.6, while Hindus and Christians had a ratio of 41 and 41.9, respectively.

❍ **Violence and Safety Concerns**: The **National Crime Records Bureau (NCRB) 2023** report reveals a troubling **4% rise** in crimes against women in India in 2022, including cases of cruelty, abductions, assaults, and sexual assault s.

- Many cases go unreported due to societal stigma, lack of trust in the justice system, and fear of retribution, worsening abuse and vulnerability.

➢ **Economic and Developmental Imperatives**

❍ **Economic Growth Potential**: It is estimated that enabling women's equal participation in the economy could boost India's 2025 **GDP** by **16%**, adding $700 billion and increasing growth by 1.4 percentage points.

- Realizing this potential requires targeted interventions to **eliminate barriers** preventing women from participating fully in the economy.

❍ **Healthcare Outcomes**: Gender-sensitive health care policies have proven effective in improving maternal and child health outcomes.

- India's **maternal mortality ratio** is 97 per 100,000 live births, and targeted initiatives could further reduce this and ensure equitable healthcare access.

❍ **Human Development**: Addressing gender inequities is fundamental to achieving the **United Nations Sustainable Development Goals (SDGs)**, particularly **Goal 5**, which emphasizes gender equality as a cornerstone for sustainable development.

➢ **Moral and Legal Dimension**

❍ **Legal Barrier**: A significant legal barrier is the absence of **gender-sensitive policing**, which perpetuates injustice.

- The **Madras High Court's** criticism of the Tamil Nadu Police for victim-blaming in the Anna University assault case emphasizes the urgent need for reform in law enforcement practices.

❍ **Constitutional Mandate**: **Articles 14, 15, 16, 39(d),** 42 of the **Indian Constitution** explicitly guarantee **equality before the law** and **prohibit discrimination** based on gender and **social security** to women.

- Ensuring compliance with these provisions is a fundamental responsibility of governance.

❍ **Global Commitments**: As a signatory to international conventions like the Convention on the **Elimination of All Forms of Discrimination Against Women (CEDAW)**, India is obligated to adopt and implement policies that promote gender equity and protect women's rights.

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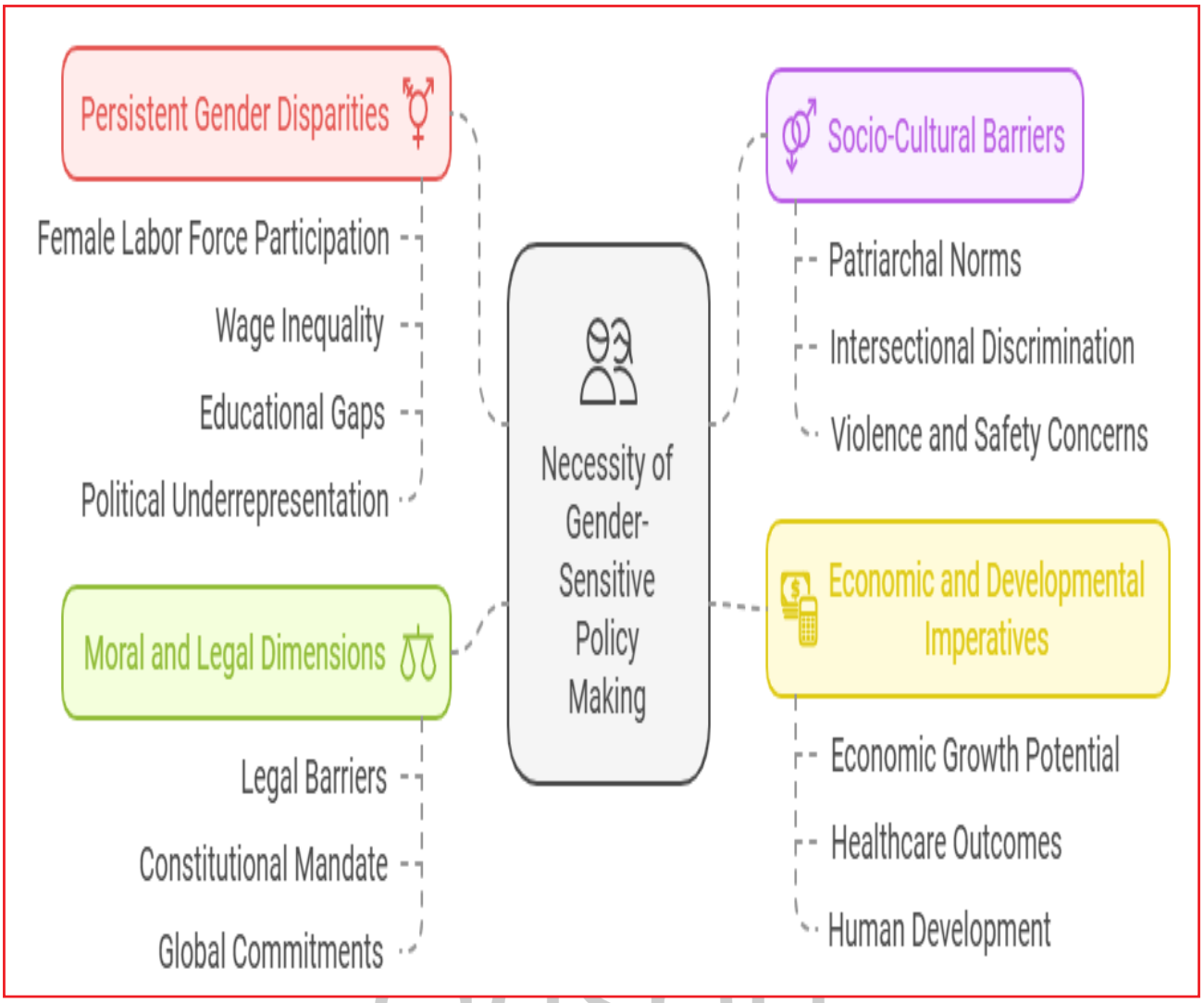

What Major Steps have been Taken Towards Gender-Sensitive Policy Making?

- **Legislative Framework**
  - **Maternity Benefit (Amendment) Act, 2017**: Maternity leave has been increased from 12 to 26 weeks for better postnatal care, and creche facilities are now mandatory in workplaces with over 50 employees to support women's workforce participation.
  - **Sexual Harassment of Women at Workplace Act, 2013**: Mandated the formation of Internal Complaints Committees (ICCs) in organizations to provide a formal mechanism for addressing workplace grievances related to sexual harassment.
  - **Criminal Law Amendment Act, 2013**: Introduced **stricter punishments** for crimes such as sexual assault and stalking, signaling a strong commitment to combating gender-based violence.
  - **Prohibition of Child Marriage Act, 2006**: Aimed to eradicate child marriages by imposing legal penalties and promoting awareness, particularly in rural and marginalized communities where the practice remains prevalent.

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- **Government Initiatives**
  - **Gender Budgeting**: Introduced in India in 2005-06, gender budgeting is a critical tool for integrating gender perspectives into policy and resource allocation.
    - The Union Budget 2024-25 allocated over **Rs. 3 lakh crore** for schemes benefiting women and girls, aiming to promote women-led development.
    - Also, ministries and departments have established **Gender Budget Cells** to monitor expenditure and assess its impact on women.
  - **Beti Bachao Beti Padhao (BBBP)**: Focused on improving the sex ratio at birth, which increased from 918 in 2014-15 to 934 in 2019-20, highlighting its impact on challenging cultural preferences for male children.
    - Integrated efforts across ministries to ensure **girls' access to education, healthcare, and nutrition**,the National Statistical Office (NSO) reports that **12.6%** of students in India drop out of school, with **19.8%** discontinuing at the secondary level and **17.5%** at the upper primary level.
  - **Schemes Prioritising Women** : Various government schemes like MGNREGA, Ujjwala Yojana, and Pradhan Mantri MUDRA Yojana prioritize women's empowerment by offering preferential access to jobs, financial aid, healthcare, and energy, aiming to enhance women's economic independence, health, and overall well-being.
    - For instance, 63.6% of the total **Mudra** beneficiaries in the financial year 2023-24 were **women entrepreneurs.**
    - Also, The One Stop Centre Scheme offers integrated services to women affected by violence, including medical, legal, psychological, and police assistance. The **Support to Training and Employment Programme (STEP)** provides training and employment opportunities for women's economic empowerment.
  - **Encouraging Participation in R&D**: The Gender Advancement for Transforming Institutions (GATI) program and **Biotechnology Career Advancement and Re-orientation (BioCARe) scheme** promote women's participation in research and development by providing career development opportunities, research grants, and fellowships in **STEM** and biotechnology.
  - **Digital Inclusion Initiatives**: PMGDISHA targeted women in underserved regions, offering digital payment training and e-governance modules to enhance their financial and civic participation.
- **Judiciary and Policing**
  - **Gender-Sensitive Policing**: The Parliamentary Standing Committee on the Ministry of Home Affairs**(MHA)** recommended that the MHA advise states and UTs to establish at least **one all-women police station** in each district.
    - Gender-sensitization training for police personnel aims to improve their understanding of gender issues and ensure empathetic handling of cases involving women.
  - **Judicial Directives**: Supreme Court guidelines mandate **gender sensitization** in workplaces and educational institutions, promoting awareness and fostering inclusive environments.
    - Also, the **Supreme Court of India** has come up with a handbook to correct gender stereotypes and guide judges on avoiding harmful stereotypes, especially about women, in judicial decisions and writing.
- **Civil Society Contributions**
  - **Grassroots Movements**: NGOs such as SEWA (Self Employed Women's Association) advocate for **labor rights**, social security, and financial inclusion for women in the informal sector, ensuring their voices are represented in policy discussions.
  - **Awareness Campaigns**: Community-based programs addressing menstrual health, domestic violence, and economic literacy have empowered women to challenge societal norms and demand equitable treatment.

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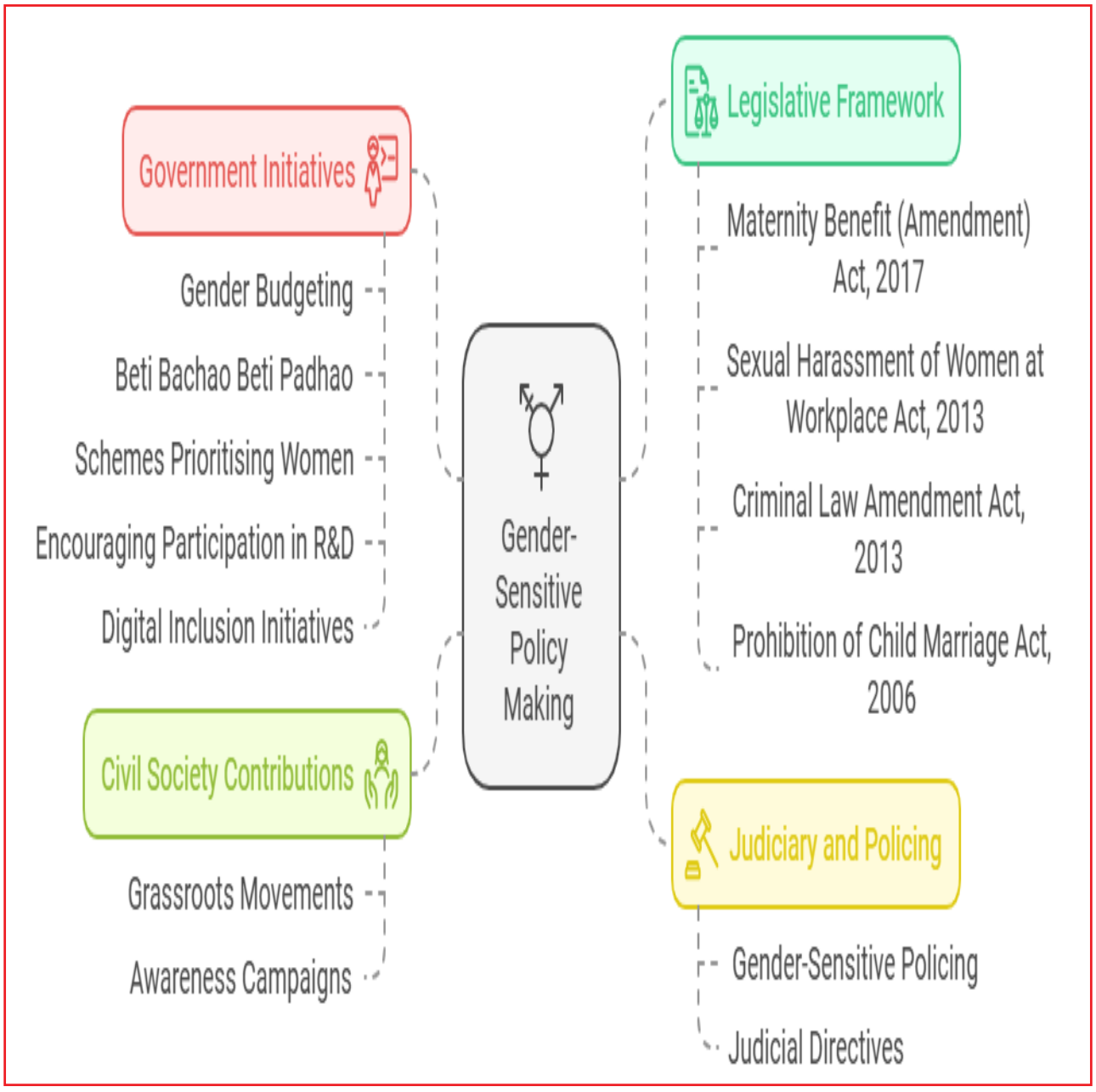

What Should be Way Forward For Gender-Sensitive Policy Making?

- **Strengthening Institutional Mechanisms**: Expand the scope of Gender Budget Cells in ministries to ensure systematic planning and allocation of resources for gender-specific programs.
  - Conduct regular **audits** to assess the **effectiveness and impact of budgetary allocations** on improving women's lives.
- **Implement Women's Reservation Act**: Expedite the implementation of the **Nari Shakti Vandan Act** to ensure **33%** representation of women in legislative bodies, thereby enhancing their participation in governance and policy formulation.

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- **Workplace Equality**: Enforce strict compliance with **equal pay laws** and incentivize organizations to adopt diversity benchmarks for gender representation across all levels of employment.
- **Data Collection and Analysis**: Implement real-time tracking systems for **gender-disaggregated** data across sectors, enabling evidence-based policy making and evaluation.
  - Conduct comprehensive time-use surveys to quantify and recognize the economic value of unpaid care work predominantly performed by women.
- **Education and Awareness**: Incorporate **gender studies** into school curricula to foster early awareness and sensitivity among students regarding gender equality.
  - Launch nationwide campaigns addressing stigma around issues such as sexual violence and reproductive rights, encouraging open dialogue and societal acceptance.
- **Digital Empowerment**: Provide targeted outreach programs to train women in cybersecurity and data literacy, bridging the digital divide and enabling access to online education and financial services.
  - Expand training programs in **STEM** fields to encourage women's participation in these high-growth sectors.
- **E-Governance for Grievance Redressal**: Develop user-friendly digital platforms for reporting gender-based violence, ensuring anonymity, and enabling swift redressal mechanisms.
- **Learning from Global Best Practices**: In 2014, **Sweden** adopted the world's first explicitly feminist foreign policy, integrating a gender perspective into all decision-making processes, which could be aligned with India's socio-political context.
  - Countries like Canada, France, and Mexico have since implemented similar policies, underscoring the transformative power of gender-inclusive governance.

Conclusion

Gender-sensitive policy making is not merely a governance tool but a socio-economic necessity. While India has made commendable strides through **progressive legislations** and initiatives, bridging systemic gaps demands continuous efforts. By addressing **structural barriers** and fostering **inclusive frameworks**, gender equity can be transformed from an ideal to a reality, ensuring justice, dignity, and sustainable development for all.

■■■

Services-led Growth Model for India

This editorial is based on "Services offer a fast and reliable path to economic development" which was published in Livemint on 30/12/2024. The article brings into picture the shift from manufacturing to services-led growth, emphasizing the role of digital transformation in driving foreign investment, high-skilled jobs, and greater opportunities for women in the workforce. For India, this global trend presents a promising path to sustainable economic development.

Tag: GS Paper - 3, Planning, Employment, Inclusive Growth

In an era where developing nations **face economic uncertainties**, a paradigm shift is reshaping growth strategies across the globe. While **manufacturing-led development has been the traditional pathway to prosperity,** new World Bank **research suggests services should take center stage.** Digital transformation has been key to this evolution, with services driving foreign direct investment, creating high-skilled jobs, and opening new opportunities for women in the workforce. As India charts its economic future, **this global trend offers valuable insights into how** services-led growth could be the catalyst for sustainable economic development.

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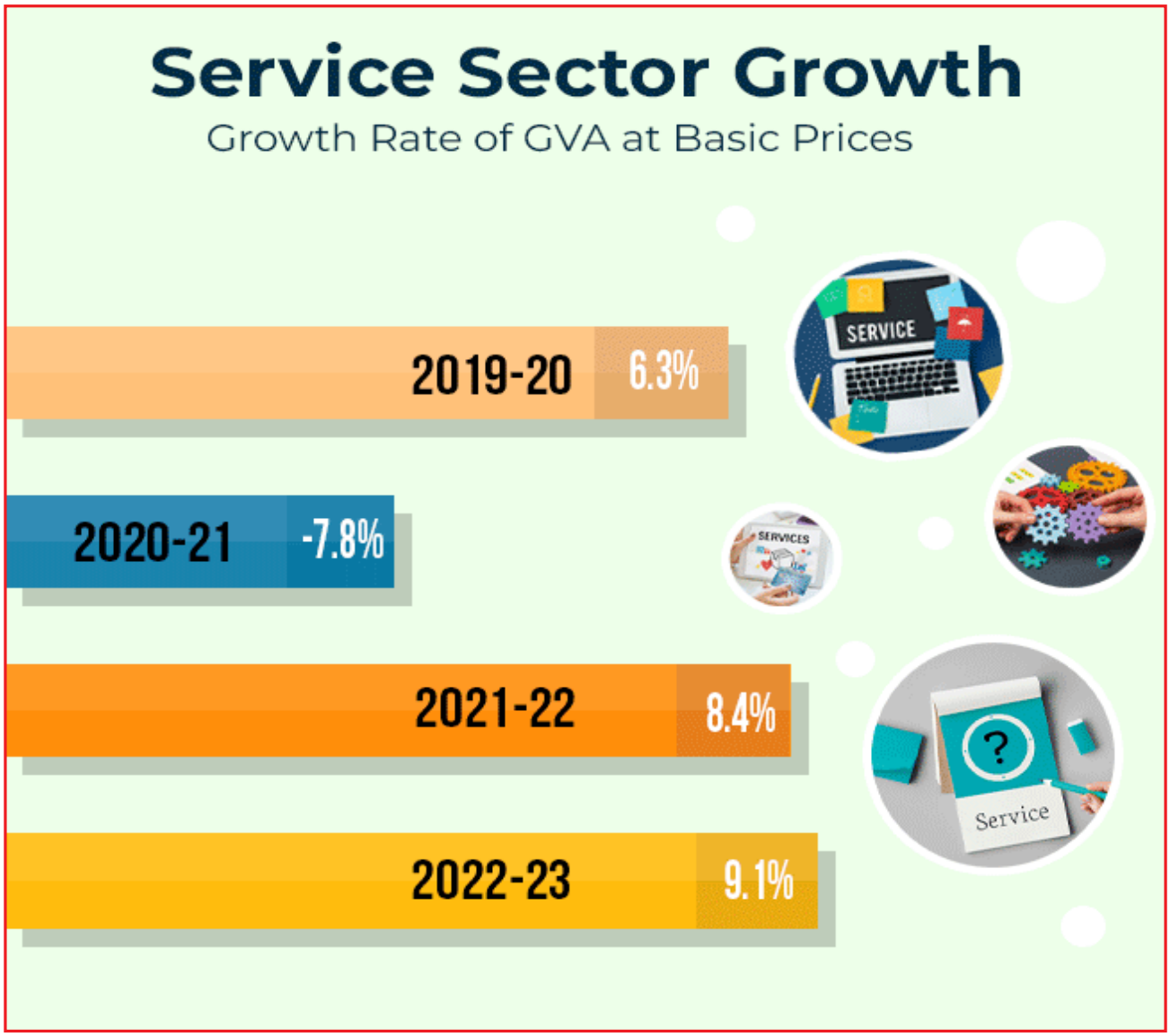

How has the Service Sector Evolved in India?

- **Pre-Independence Era (Before 1947)**
  - **Limited Role**: The service sector was underdeveloped, **primarily limited to colonial administration, transportation** and traditional services like **trade and education**
  - **Infrastructure Focus**: British initiatives led to the **development of railways, postal services, and telegraph systems**, which laid the foundation for modern service industries.
  - **Urban Concentration**: Service sector activities were concentrated in urban centers like **Mumbai, Kolkata, and Chennai.**
- **Post-Independence and Early Decades (1947–1980s)**
  - **State-Driven Development**: The government played a key role in providing public services like **education, healthcare, banking, insurance, and transport.**

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- Establishment of public sector enterprises (**e.g., LIC, nationalized banks like SBI**) strengthened financial and administrative services.

❍ **Agrarian and Industrial Focus**: Despite service sector growth, the emphasis was on **agriculture and industrialization through Five-Year Plans.**

- The **service sector's contribution to GDP was modest, around 30%,** dominated by low-productivity traditional services.

➢ **Economic Liberalization and Globalization (1991 Onwards)**

❍ **Economic Reforms of 1991**: Liberalization policies removed restrictions on trade, foreign investment, and private enterprise.

- The **IT and IT-enabled services (ITES) industry** emerged as a game-changer.
- Companies like **Infosys, TCS, and Wipro** became global leaders in software services.

➢ **BPO (Business Process Outsourcing) and KPO (Knowledge Process Outsourcing) sectors** flourished due to India's skilled, English-speaking workforce and cost advantages.

❍ **Growth of Financial and Professional Services**: Liberalization of the banking, insurance, and stock market sectors fueled expansion.

- Emergence of **legal, consulting, and accounting firms** catering to domestic and international clients.

❍ **Tourism and Hospitality**: Growth in **domestic and international tourism** contributed significantly to the economy.

➢ **Current Trends (2000s Onwards)**

❍ **Dominant Role in GDP**: The service sector contributes approximately 5**5–60% of India's GDP** but **employs only around 32% of the workforce.**

❍ **Diverse Sub-Sectors**:

- **IT and Digital Services**: India is a **global IT powerhouse,** providing software and digital solutions worldwide.
- **Telecommunication**: With the **rapid spread of internet and mobile services,** India has become the second-largest internet user base.
- **E-Commerce**: Companies like **Flipkart, Amazon, and Zomato** have revolutionized retail and service delivery.
- **Healthcare and Education**: Growth of private hospitals and universities has made India a hub for **medical tourism and global education services.**
- **Media and Entertainment**: **Bollywood, OTT platforms, and sports broadcasting** have emerged as significant contributors to GDP.

How Services-led Growth Could be the Catalyst for Economic Development for India?

➢ **Job Creation in Emerging Sectors:** The service sector, **especially IT, digital platforms, and e-commerce,** has become a primary engine of employment growth in India by leveraging its large, skilled workforce.

❍ It offers opportunities across the skill spectrum, reducing unemployment and underemployment.

❍ For example, the **IT-BPM sector employs 5.4 million professionals** (as of March, 2023), and India's gig economy is expected to reach **23.5 million workers by 2030**.

➢ **Global Leadership in Digital Services:** India's competitive edge in IT and emerging technologies positions it as a global hub for digital solutions, supporting economic growth.

❍ Sectors like **AI, blockchain, and cloud computing** add strategic importance to exports.

❍ India's IT-BPM revenues stood at **$245 billion in 2023-24**, and UPI has **revolutionised digital payments in the country**.

➢ **Urban Development through Smart Services:** Service-led urban solutions address urbanization challenges like **traffic management and waste handling,** promoting sustainable growth.

❍ Projects like **Smart Cities** enhance urban livability while spurring infrastructure investment.

❍ For instance, over **84,000 CCTV surveillance** cameras have been installed in **100 Smart Cities,** aiding in **crime monitoring, improving urban security and efficiency.**

➢ **Rural Inclusion through Digital Platforms:** Digital services democratize access to healthcare, education, and banking in rural India, reducing regional disparities.

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- These platforms empower rural populations and integrate them into the national economy.
- For example, the **telemedicine market in India is expected to grow** at a compound annual growth rate(CAGR) of **31% for the period 2020–25** while 47.8 million rural citizens certified as digitally literate under **PMGDISHA.**

➢ **Green Services for Environmental Sustainability:** Sustainability-focused services like **green finance and renewable energy consulting** are crucial for mitigating climate change.

- They drive investments into clean energy while fostering economic growth.
- The government auctioned **sovereign green bonds** worth **₹20,000 crore in FY24 and National Green Hydrogen Mission** is projected t**o create 6 lakh jobs by 2030, illustrating the green jobs model.**

➢ **Human Capital Development via Health and Education:** Expanding healthcare and education services fosters a **healthier, skilled workforce, crucial for long-term growth.**

- EdTech and health schemes are transforming accessibility and outcomes.
- Over **42 crore health records have been connected to Ayushman Bharat Health Accounts,** facilitating easy access to medical histories and improving healthcare delivery, and India's **EdTech market reached $5 billion in 2023,** improving service delivery and quality.

➢ **Financial Inclusion through FinTech:** FinTech innovations are revolutionizing banking, ensuring financial access and reducing economic inequalities.

- This **digital transformation** enhances savings and formal economic activity.
- **Unified Payments Interface (UPI)** transactions have grown from 92 crore in FY 2017-18 to **13,116 crore in FY 2023-24**, and **PM Jan Dhan Yojana** accounts crossed **500 million in August 2023**, boosting financial inclusion.

➢ **Service Exports Driving Trade Balance:** Service exports are critical for offsetting **India's merchandise trade deficit and earning foreign exchange.**

- India's stronghold in IT and professional services underpins this strategy.
- India's services exports surged by a **record 26.6% in 2022-23 (FY23),** reaching **$322 billio**n, as per data released by the **Reserve Bank of India (RBI),** offsetting deficits and bolstering India's global economic footprint.

➢ **Catalyzing Infrastructure Growth via PPPs:** Public-private partnerships (PPPs) in services like logistics and transport enhance infrastructure development, fostering economic linkages.

- The **Delhi-Mumbai Industrial Corridor, with investments of $17 billion,** integrates industrial and logistics services, driving economic productivity.
  - Such initiatives **anchor sustainable growth strategies.**

What are the Key Issues Related to the Service-Led Growth Model for India?

➢ **Jobless Growth in Services Sector:** While the service sector dominates GDP, its ability to **generate large-scale employment remains limited** compared to agriculture and manufacturing.

- Most jobs created are either low-paying or require specialized skills, leading to rising inequalities. The service sector contributes to **almost half of India's GDP but employs only one-third of its workforce.**
  - Additionally, India's unemployment rate stands at **8.1% (CMIE, April 2024)**, reflecting a mismatch between job creation and workforce demands.

➢ **Lack of Focus on Manufacturing and Agriculture:** Overemphasis on services diverts attention from manufacturing and agriculture, sectors essential for **large-scale job creation and rural development.**

- According to the Economic Survey 2023-24, India's workforce stands at nearly 56.5 crore, with **over 45% employed in agriculture and 11.4% in manufacturing.**
- Sole focus on the service sector would result in **uneven sectoral growth, undermining holistic economic development.**

➢ **Skewed Regional Development:** Service-led growth is disproportionately concentrated in **urban areas**, leaving rural and backward regions underdeveloped.

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- This creates regional imbalances and exacerbates rural poverty.
- For example, **Karnataka's IT exports (led by cities like Bangalore)** surged by an impressive **27%,** boosting the **state's share in India's IT exports to 42%.**
  - While states like **Bihar and Jharkhand** remain dependent on agriculture, with poverty at **33.76%** and **28.81%** respectively. (NITI Aayog).

- **Dependence on External Demand:** India's service exports, particularly **IT and BPO,** rely heavily on global markets, making the economy vulnerable to external shocks like **recessions in the US or EU.**
  - Such reliance exposes the sector to volatility in global demand. A report by **Nirmal Bang Securities** suggests that, despite India's robust economic position, the country is not entirely insulated from a potential US recession.
    - Even under **"normal" economic conditions**, global economic pressures have slowed India's domestic growth by **approximately 1.5-2.5%**, implying that a **downturn in the US could have a further impact on India's economy.**
- **Skill Gaps and Workforce Mismatch:** The lack of alignment between the skills of the workforce and industry demands limits the scalability of the service sector.
  - While the sector demands tech-savvy and high-skilled professionals, much of India's labor force remains semi-skilled.
  - The India's Graduate Skill Index 2023 revealed that **only 45% of Indian graduates seeking employment have the skills required to meet the rapidly evolving demands** of the industry.
  - According to the 68th Round of NSSO, **only 4.69% of India's workforce has received formal skill training**, compared to **52% in the USA, 68% in the UK, and 75% in Germany.**
- **Urban Congestion and Infrastructure Strain:** Service-led urbanization has led to overcrowding, traffic congestion, and inadequate infrastructure in major cities.
  - This reduces productivity and livability. Bengaluru, for instance, was ranked as having the **second-worst traffic globally**.
  - India is currently **35% urban, a figure projected to rise to 53% by 2047**. This means the urban population will nearly double, with an **additional 400 million people moving to cities**, which is placing immense pressure on urban amenities.
- **Exclusion of Informal Economy:** The informal sector, which employs over **90% of the workforce**, is largely excluded from the benefits of the service-led growth model.
  - This perpetuates vulnerabilities, with workers lacking social security and income stability.
  - For instance, despite the rise of platforms like **Swiggy and Uber**, gig workers face wage exploitation **(over 77% earn less than Rs 2.5 lakh annually)** despite overwork.
    - A recent survey across 32 cities in India found that **85% of gig workers work more than eight hours a day** as drivers and riders, with 21% working over 12 hours daily.
- **Low Domestic Consumption of Services:** Service-led growth heavily relies on exports, as domestic consumption of services remains limited due to low income levels and inadequate infrastructure.
  - For example, India's services sector growth slowed in May 2024 due to weakened domestic demand, with the **Purchasing Managers' Index (PMI) dropping to 60.2.**

How can India Sustain Service Sector Growth While Driving Service-Led Manufacturing and Agriculture Growth ?

- **Promote Skill Development and Industry Collaboration:** India must align skill development programs with industry demands, bridging workforce gaps in both services and manufacturing.
  - Collaborating with private players under initiatives like **Skill India** and **PMKVY (Pradhan Mantri Kaushal Vikas Yojana)** can ensure employability and scalability.
  - For example, partnerships with **IT giants like Infosys can upskill youth in digital technologies**, supporting IT services, while training in advanced

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manufacturing techniques **under PLI (Production-Linked Incentive) schemes can boost industrial productivity.**

- **Develop Integrated Agro-Processing and Services Hubs: S**etting up agro-processing clusters integrated with logistics and digital services can enhance value addition in agriculture and link rural economies with global markets.
  - Initiatives like **PMFME (Pradhan Mantri Formalisation of Micro Food Processing Enterprises),** combined with **e-NAM** (National Agriculture Market), can create such hubs.
  - For instance, digital platforms connecting farmers with buyers can increase efficiency, while food processing units generate rural employment and boost exports.
- **Invest in Smart Infrastructure for Urban-Rural Linkages:** Building smart infrastructure, including rural roads, cold chains, and warehousing, can connect rural agricultural production with urban service and manufacturing industries.
  - The convergence of **PM Gati Shakti** for logistics infrastructure and **Rurban Mission** can address these gaps.
  - For example, **well-developed logistics networks can link food surplus states like Punjab to urban markets,** reducing wastage and enhancing supply chain efficiency.
- **Enhance MSME Support with Digital Ecosystems:** Micro, Small, and Medium Enterprises (MSMEs) can act as a bridge between the service and manufacturing sectors if supported through digital transformation.
  - Expanding platforms like **Udyam Portal** for ease of registration, combined with **Open Network for Digital Commerce (ONDC)**, can bring small businesses into mainstream supply chains.
  - For instance, digitizing small manufacturers can enable them to supply parts to large service industries like hospitality or IT.
- **Leverage FinTech for Agricultural and Rural Credit:** Expanding financial access using FinTech innovations can provide farmers and rural enterprises with the credit needed to invest in modern farming and agri-business.
  - Schemes like **PM Jan Dhan Yojana (PMJDY)** combined with platforms like **Kisan Credit Card digitization** can ensure seamless credit delivery.
  - For example, **integrating AI-based risk assessment tools** with rural lending can reduce NPAs and empower farmers to adopt high-yield techniques.
- **Boost Tourism and Hospitality as Rural Employment Drivers:** Promoting rural tourism through homestay programs, cultural circuits, and eco-tourism can create jobs while preserving rural heritage.
  - Schemes like **Swadesh Darshan** and **PMEGP (Prime Minister's Employment Generation Programme)** can collaborate to empower artisans and small entrepreneurs.
  - For instance, eco-tourism projects in Uttarakhand provide sustainable incomes to locals while attracting global tourists, linking agriculture with hospitality.
- **Promote Renewable Energy Services to Support Manufacturing:** Scaling up renewable energy services can provide sustainable and low-cost power for manufacturing and agriculture.
  - Schemes like **KUSUM (solar irrigation)** and **National Solar Mission** can collaborate to create energy ecosystems for rural enterprises.
  - For instance, solar-powered cold storages can reduce post-harvest losses while supporting small-scale agro-processing industries.
- **Strengthen Research and Innovation through Public-Private Partnerships (PPPs):** Encouraging innovation through PPPs can lead to advancements in both services and manufacturing.
  - Establishing innovation hubs under **Startup India** linked with industrial parks can foster R&D in automation, agri-tech, and logistics.
  - For example, partnerships between **universities and companies like Mahindra Agri Solutions** can create affordable farm machinery, blending services with manufacturing for agricultural transformation.
- **Digitalize Supply Chains for Efficiency:** India can streamline supply chains across agriculture, manufacturing, and services by leveraging digital tools like blockchain and IoT.
  - Schemes like **PM Gati Shakti** can integrate with tech platforms to improve real-time tracking and delivery.

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- For example, **blockchain-enabled traceability in agricultural exports** can ensure compliance with global quality standards, benefiting both farmers and exporters.

- **Expand Export Potential Through Skill and Service Integration:** Integrating manufacturing with high-quality services like logistics, finance, and IT can enhance India's export competitiveness.
  - Aligning PLI incentives with **SEZ (Special Economic Zone)** policies for service exports can create globally competitive industries.
  - For instance, combining pharmaceutical manufacturing with regulatory consulting services can help tap new markets.
- **Focus on Women's Empowerment in Services and Agriculture:** Women can drive rural economic growth if supported in accessing education, credit, and entrepreneurial opportunities.
  - Linking **SHGs (Self-Help Groups)** under **Deendayal Antyodaya Yojana** with digital marketing platforms can empower women farmers and service providers.
  - For example, **women-led dairy cooperatives in Gujarat** contributed significantly to **Amul's success,** showcasing synergies between agriculture and services.

Conclusion:

India's **service-led growth** offers a promising path to sustainable economic development, aligning with **SDG 8 (Decent Work and Economic Growth) and SDG 9 (Industry, Innovation, and Infrastructure).** By leveraging digital services, improving skill development, and promoting inclusive growth through rural and urban linkages, India can address existing inequalities and regional disparities. Also, balancing the growth of services with agriculture and manufacturing remains critical for holistic and long-term development.

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Drishti Mains Questions

1. With the increasing reliance on digital technologies in India, the country faces growing risks from emerging cyber threats. What measures should be adopted to enhance India's resilience against such evolving cyber risks?
2. Critically examine the potential benefits and challenges of legalizing MSP in the context of India's agricultural sector, and suggest measures to ensure its effective implementation
3. Evaluate the emerging nuclear threats to India in the context of global security dynamics. What strategic measures should India adopt to mitigate these risks?
4. Despite several regulatory measures, plastic waste management continues to face significant challenges in India. Identify and discuss the key issues in the implementation of the Plastic Waste Management Rules
5. "Water mismanagement in India poses a significant threat to its socio-economic and environmental sustainability." Discuss the consequences, and measures needed to address this challenge.
6. India's startup ecosystem has gained global recognition, yet challenges like funding gaps, regulatory hurdles, and limited innovation scaling persist. Discuss.
7. Examine the major causes of soil degradation in India and assess the effectiveness of current government measures to combat it. Suggest additional strategies to restore soil health and ensure sustainable agriculture.
8. "Minilateralism is emerging as a dominant approach in global governance, offering flexible and focused solutions to regional and global challenges". Discuss the advantages and limitations of minilateral frameworks.
9. Analyze the challenges faced by India's manufacturing sector in meeting global standards. What measures should be taken to enhance its international competitiveness?
10. "Universal Health Coverage (UHC) is essential for achieving equitable and inclusive development in India." Discuss the challenges in achieving UHC and suggest measures to ensure quality, accessibility, and affordability of healthcare for all.
11. Examine the potential benefits and challenges of implementing 'One Nation, One Election' (ONOE) in India. What can India Learn from Other Countries Regarding One Nation, One Election?
12. Examine the impact of globalization on India's economy, society, and cultural identity. Discuss what measures India should adopt to harness its benefits while mitigating its adverse effects.
13. Examine the current status of the tourism sector in India. What are the challenges faced by the sector, and how can the government and private players collaborate to address them?
14. "While the Environmental, Social, and Governance (ESG) framework is critical for India's sustainable growth, its effective implementation faces several challenges." Discuss the significance of ESG for India and suggest measures to overcome the existing hurdles.

Drishti Mains Questions

15. Examine the legal landscape surrounding the development and deployment of Artificial Intelligence in India. What measures can be implemented to ensure that AI technologies are used responsibly?
16. Examine the role of regulatory bodies and policies in ensuring the quality, pricing, and accessibility of drugs in India. Discuss the challenges faced by the pharmaceutical industry in light of the existing regulatory framework.
17. "India-Russia relations have stood the test of time, but changing global dynamics pose new challenges and opportunities for this partnership." Discuss.
18. Discuss the significance of the Gulf region for India and suggest strategies to strengthen this partnership amidst regional challenges
19. "India's transition to a green economy is seen as essential for addressing both climate change and sustainable development". Discuss the challenges and opportunities India faces in achieving this transition.
20. What are the Key challenges hindering rural growth in India, and what measures can be taken to promote sustainable and inclusive development?
21. Critically examine the potential benefits and challenges of implementing a Central Bank Digital Currency (CBDC) in India. Discuss its implications for financial inclusion, monetary policy, and the stability of the commercial banking system
22. Critically evaluate India's disaster management framework, highlighting key policy reforms, persisting challenges, and potential measures to strengthen disaster resilience in the context of increasing climate vulnerabilities.
23. Forests are vital for ecological balance, economic development, and cultural heritage. Critically analyze the challenges faced in forest conservation in India and suggest measures to ensure their sustainable management in the face of climate change and development pressures.
24. What are the key socio-economic and cultural disparities faced by women in India, and how can gender-sensitive policy making address these challenges.
25. Services-led growth has been identified as a potential catalyst for economic development in India. Discuss the role of the services sector in driving India's economic transformation, examining the opportunities and challenges it presents in achieving sustainable development.