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# GENERAL STUDIES - I

## Social Issues

### What India can do to reduce food wastage?

The **issue of food loss and waste (FLW) is a critical global challenge** that has profound implications for food security, environmental sustainability, and economic efficiency.
Recognising the urgency of the matter, **the United Nations designated September 29 as the International Day of Awareness of Food Loss and Waste (FLW).**

It is **important to have an assessment on the scale of food loss and waste, its environmental impact, and India's specific challenges** and efforts to mitigate these losses.

**Global Impact of Food Loss and Waste -**

- **According to a 2023 Food and Agriculture Organisation (FAO) report**, food lost between harvest and retail **accounts for 13.2% of global food production, while UNEP estimates that 17% of food is wasted** at the retail and consumption stages.
- Combined, **this amounts to nearly 30% of global food production being lost or wasted each year**.
- **If just half of this food could be saved, it would be sufficient to feed all the world's hungry people,** thus contributing to the global fight against hunger.
- Furthermore, **reducing FLW would lead to a significant decrease in greenhouse gas (GHG)**
- It is estimated that **FLW contributes to 8-10% of global GHG emissions** and **accounts for 38% of total energy usage in food production.**

**An Assessment on Causes of Food Loss in India -**

- Lack of Mechanisation **—**
- The **All-India Debt and Investment Survey (AIDIS)** in 2019 revealed that only **4.4% of cultivator households in India owned tractors, and only 5.3% owned essential farm equipment** such as power tillers, combine harvesters, or threshers.
- **Small and marginal farmers,** who make up over 86% of India's agricultural households, often **cannot afford these machines.**
- As a result, **manual methods are still widely used, which increases the risk of food loss** during harvesting and processing.
- For instance, **combine harvesters, when used in paddy cultivation, significantly reduce grain losses** compared to traditional methods, but their use is limited to **regions like Punjab, where 97% of paddy-producing households use mechanised equipment.**
- In contrast, **only 10% of paddy farmers in Bihar have access to such equipment.**
- Inadequate Cold Chain Infrastructure **—**
- India's **cold chain infrastructure is underdeveloped**, particularly for perishable goods like fruits, vegetables, and dairy products.
- Due to the lack of proper refrigeration and temperature-controlled transport, **a large proportion of horticultural crops are lost** before they even reach the market.
- The **absence of efficient cold chains results in spoilage and wastage**, reducing both the availability of fresh produce and the potential income for farmers.
- According to a survey, **horticultural crops are especially vulnerable**, with nearly 50 MMT lost annually due to this deficiency.
- Traditional Drying and Storage Methods **—**
- While **sun drying is a low-cost option, it exposes food to contamination from dust, pests, and uneven moisture levels**, leading to quality degradation and food loss.
- Furthermore, **inadequate storage facilities exacerbate post-harvest losses, with 10% of total food grain production is lost** due to poor and inadequate storage infrastructure.
- **Without access to modern drying technologies such as solar dryers or proper storage infrastructure** like warehouses and silos, **farmers face significant challenges** in preserving their produce, especially during the monsoon season.
- Transportation and Supply Chain Inefficiencies **—**
- India's vast geography, coupled with poor road infrastructure in rural areas, means that **transporting crops from farms to markets can take considerable time.**
- During this period, **perishable goods are particularly prone to spoilage** due to exposure to heat, moisture, and handling damage.
- **Even non-perishable items such as grains can suffer from poor handling and packaging** during transit, leading to further losses.

**Impact of Food Loss in India -**

- Economic Consequences —
- The monetary value of food loss in India is alarming, **with Rs 1.53 trillion worth of food wasted annually.**
- This **translates into lost income for farmers, especially small and marginal farmers** who cannot absorb these losses.
- Food loss **also affects the country's GDP, as agriculture accounts for a significant portion** of India's economy.
- Additionally, **the lost produce could have been sold domestically or exported,** reducing potential revenue streams for both the government and farmers.
- Environmental Impact —
- **Agriculture is a resource-intensive sector**, requiring large amounts of water, energy, and land, therefore, **when food is lost or wasted, all the resources that went into producing it are wasted as well.**
- **In India, this is particularly concerning** given the country's ongoing struggles with water scarcity and land degradation.
- Furthermore, **food that is discarded often ends up in landfills**, where it decomposes and produces methane, a potent greenhouse gas.
- **Reducing food loss would not only conserve resources but also lower the country's greenhouse gas emissions**, contributing to the fight against climate change.
- Social and Food Security Implications —
- According to the Global Hunger Index, **India ranks poorly in terms of hunger and malnutrition,** with millions of people unable to access sufficient nutritious food.
- The **fact that such a large quantity of food is lost each year while millions go hungry is a stark indicator of systemic inefficiencies.**
- **If even a portion of the food lost post-harvest could be saved, it would significantly improve food security in the country** and reduce the incidence of malnutrition, particularly in rural areas.

**Solutions to address the Food Loss Problem in India -**

- Mechanisation and Technological Interventions —
- **Expanding the use of mechanised farming equipment,** particularly among small and marginal farmers, is essential for reducing post-harvest losses.
- Initiatives such as **Farmer Producer Organisations (FPOs) and Custom Hiring Centres (CHCs) can help farmers access machinery** through group leasing or shared services.
- Additionally, **investing in green technologies like solar dryers and modern storage facilities can further reduce losses**, particularly for perishable goods.
- Improving Cold Chain Infrastructure —
- **Building a robust cold chain infrastructure is crucial** for reducing the spoilage of perishable products.
- Government initiatives to **encourage private investment in cold chains, as well as publicprivate partnerships, can help bridge the infrastructure gap.**
- **Expanding cold storage facilities and improving refrigerated transportation would enable farmers to extend the shelf life of their produce** and reach wider markets, thereby reducing food loss.
- Policy Reforms —
- **Policy interventions are necessary** to ensure that small and marginal farmers can benefit from technological advancements and infrastructure improvements.
- For instance, **revisiting the Jute Packaging Material Act (JPMA) to allow for the use of airtight bags in place of jute bags could significantly reduce storage** and transit losses.
- Similarly, **government programs that offer subsidies** for modern storage facilities, cold chains, and mechanised equipment **would support farmers in reducing food loss.**
- Education and Awareness Campaigns —

- **Educating farmers** about best practices in harvesting, drying, and storage **is crucial for minimising losses.**
- **Training programs on the use of modern technologies,** such as combine harvesters and solar dryers, **can empower farmers to adopt more efficient methods.**
- Additionally, **raising awareness among consumers about food waste at the household level**, **especially in urban areas** where waste from weddings and events is high, could help reduce food wastage.

**Conclusion** -

- **India's food loss and waste** problem presents **both a challenge and an opportunity.**
- **Reducing food loss is not merely an economic necessity but a moral obligation**, especially in a country where millions still suffer from hunger and malnutrition.
- **By prioritising solutions, India can contribute to global efforts to tackle food loss and waste** while fostering a more sustainable and resilient agricultural system.

**Source** - **The Indian Express**

**QUESTION - Food loss and waste (FLW) is a global challenge with serious implications for food security, environmental sustainability, and economic efficiency. Discuss the major causes of food loss in India and the impact it has on the economy, environment, and food security. Suggest viable solutions that can help mitigate these losses, particularly in the context of India's agricultural sector.**

# GENERAL STUDIES - II

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## Governance

### Time to fix the UPSC selection process

The recent revelations surrounding the Union Public Service Commission (UPSC) and the Indian Administrative Service (IAS) have significantly tarnished their once-revered image. The case of Puja Khedkar, along with the earlier National Eligibility-Cum-Entrance Test (NEET) fiasco, has exposed deep-rooted flaws in India's system of higher education and national-level selections.

**Issues and Concerns** -

- **Abuse of Reservation Systems —** The UPSC case has highlighted serious concerns regarding the implementation of reservation for Other Backward Classes (OBC) and Economically Weaker Sections (EWS). The income criteria for these categories, determined by Tehsildar-issued certificates, have been subject to manipulation and fraud.
- **Lack of Clarity and Verification —** There is ambiguity regarding whether the candidate's income or their father's income should be considered. Additionally, the dynamic nature of income poses challenges in maintaining the integrity of the reservation system.
- **Ineffective Oversight —** The Tehsildars responsible for issuing income certificates often lack the necessary authority and resources to verify the accuracy of the information provided.
- **Rampant Corruption —** The 'sifarish' culture and lack of proactive scrutiny have created an environment where merit is often compromised in favor of personal connections.
- **Compromised Merit —** The misuse of reservation systems and the prevalence of corruption have undermined the principle of meritocracy, leading to the selection of unqualified candidates.
- **Public Disillusionment —** The erosion of trust in the civil services has led to public disillusionment and a decline in faith in India's democratic institutions.

**The Way Forward** -

- **Increased Transparency and Technology —** Implementing a more transparent system, incorporating technology-based solutions, can help prevent fraudulent practices.
- **Clear Guidelines and Verification —** The government needs to establish clear guidelines for income and disability criteria, applicable nationwide. Robust verification mechanisms should be put in place.
- **Accountability and Penalties —** Strict penalties must be imposed on officials who certify people wrongly. Courts should play a crucial role in ensuring accountability.
- **Structural Reforms —** The Department of Personnel and Technology should review and revise policies related to mental disability and aptitude tests for civil services.
- **Strengthened Ethical Framework —** A strong ethical framework should be instilled in the civil services to promote integrity, accountability, and public service.
- **Public Engagement and Participation —** Engaging with the public and seeking their input in the reform process can help build trust and legitimacy.

**Conclusion** -
The erosion of trust in India's civil services is a serious matter. To restore public confidence, it is imperative to address the underlying issues and implement comprehensive reforms. By prioritising transparency, accountability, and merit-based selection, India can ensure that its civil services continue to serve the nation with integrity and efficiency.

**Source** - **The Hindu**

**QUESTION - Critically analyse the factors contributing to the erosion of trust in India's civil services. Discuss the implications of this decline on governance, public perception, and the overall functioning of democratic institutions. Propose concrete measures to restore public faith in the civil services and ensure their effectiveness in serving the nation.**

# Why digitisation is not enough for land reforms?

**India's land governance system is deeply entangled in a complex network of legal, institutional, and administrative challenges** that have hampered the country's economic and social development.
As highlighted in the Economic Survey 2023-24, **these challenges are barriers to achieving multiple developmental goals.**
**While the 2024 Budget proposed technological solutions** to modernise India's land administration, **such initiatives do not address the deeply rooted legal and institutional barriers** that hinder effective land governance.

**An Analysis of Barriers in Land Governance** -

- Unclear Land Titles and Insecure Tenure **—**
- One of the most significant issues in India's land governance is the **lack of clear and secure land titles.**
- **Ownership of land in India is often ambiguous** due to outdated records, poor maintenance of land registries, and overlapping claims.
- This **problem is especially prevalent in rural areas** where the majority of landholdings are informal and not officially registered.
- **Farmers and landowners cannot confidently invest in long-term improvements on their land,** as they lack formal proof of ownership.
- **Ambiguous ownership frequently leads to land disputes,** which clog the judicial system. • Fragmented and Conflicting Legal Framework **—**
- **India's land governance is subject to a myriad of conflicting laws** that vary across states and regions, adding to the complexity and inefficiency of the system.
- **These laws regulate land ownership, transfers, leasing, and land use** in ways that are **often contradictory or overlapping.**

- **Several laws impose restrictions on the transfer of land**, especially agricultural land.
- In many states, **only certain individuals or groups can purchase agricultural land, and transfers are subject to rigid regulations** that differ from one state to another.
- Fragmentation of Land Holdings **—**
- Land fragmentation is one of the most pressing challenges in India's agricultural sector.
- **Over time, as land is passed down through generations, it is divided into smaller and smaller parcels.**
- **Small landholdings prevent farmers from benefiting from economies of scale,** as they lack the resources to invest in modern machinery, advanced irrigation techniques, or highquality seeds.
- Gender Inequality in Land Ownership **—**
- Despite several legal provisions that aim to improve women's access to land ownership, **gender inequality remains a pervasive issue in India's land governance.**
- **Women, especially in rural areas, are often denied their rightful share of property** due to social norms, patriarchal traditions, and legal loopholes.
- **While legal reforms such as the Hindu Succession Act have been introduced to grant women equal inheritance rights,** in practice, women are often pressured to forgo their claims to family property in favour of their male relatives.
- Land Use Restrictions and Regulatory Barriers **—**
- Many **laws in India impose restrictions on how land can be used**, particularly in the agricultural sector.
- **These land use regulations are often rigid and outdated**, preventing landowners from converting their land for more economically viable purposes.
- **For instance, land that is designated for agricultural use cannot easily be converted for industrial or commercial purposes**, even if such a conversion would lead to higher economic returns.
- These **regulations also limit leasing opportunities**, thereby stifling investment in the land.

**Proposed Reforms: Digitisation and Its Limitations -**

- Proposed Reforms **—**
- To address some of these challenges, **the 2024 Budget proposed several digitisation initiatives, including the digitisation of land records,** the creation of land registries, and the assignment of unique identification numbers to land parcels.
- Additionally, **efforts to integrate land records with digital platforms such as Agri Stack have been suggested to streamline land administration.**
- While **these reforms could modernise the way India manages its land records, they fall short of addressing the root causes of land-related problems**, which are legal and institutional in nature.
- Limitations of Digitisation **—**
- The uncertainty surrounding land ownership and insecure property titles are not solely due to the paper-based nature of land records **but stem from conflicting laws and administrative procedures.**
- For example, **digitising urban land records may not necessarily lead to improved land ownership or access to formal credit**, as long as the underlying legal framework remains convoluted and restrictive.
- A **digitised system cannot overcome the risks associated with land transactions, which remain subject to numerous laws restricting land transfers**, leasing, and use.
- The persistence of legal ambiguity, particularly in the context of agricultural land leasing, further undermines the effectiveness of digitisation efforts.

**The Real Solution to India's Complex Land Governance System - •**

Legal Recognition of Land Titles **—**

- A central component of reform must be the **establishment of a legally recognised and enforceable system of land titles.**

- This **involves creating a unified framework that provides a clear and indisputable record of ownership.**
- The **current system, in which ownership is often based on possession rather than formal title, needs to be replaced** with one that provides individuals and businesses with secure and transferable property rights.
- Guaranteed Tenure Security **—**
- Strengthening tenure security is crucial for encouraging investment in land.
- **Farmers, in particular, need assurance that they will not lose their land to expropriation** or disputes, which will enable them to make long-term investments in agricultural productivity.
- **Clear property rights are also necessary to give landowners access to formal credit**, as banks are more willing to offer loans when the collateral is secured by legally recognised titles.
- Liberalising Land Transfers **—**
- Many state laws impose unnecessary restrictions on the sale and purchase of agricultural land, **such as limiting who can buy or sell land and restricting the use of land for nonagricultural purposes.**
- These **restrictions hinder the transfer of land to more efficient users**, stifle investment, and discourage land consolidation.
- **Legal reforms should aim to remove such restrictions** while ensuring that land transfers are transparent, equitable, and subject to fair compensation.
- Reforming Land Leasing Laws **—**
- **In many states, land leasing is either prohibited or heavily regulated.**
- This **creates a barrier to the efficient use of land,** as owners who are unable or unwilling to farm their land cannot legally lease it to more capable or interested farmers.
- **Reforming these leasing laws** to allow for more flexible and transparent leasing arrangements **would not only increase agricultural productivity but also provide a livelihood option for landless farmers** and rural workers.
- Simplifying Consolidation Procedures **—**
- The legal and administrative barriers to land consolidation need to be removed.
- This **could involve simplifying the process for merging small and fragmented parcels of land into larger, more economically viable holdings.**
- **Legal frameworks should encourage voluntary land consolidation**, offering incentives to landowners who choose to merge their parcels for more productive use.
- Supporting Collective Farming Models **—**
- **Another avenue for land consolidation is through collective farming models,** where multiple small farmers pool their resources and land to achieve economies of scale.
- **Legal reforms could promote such models by providing clear guidelines for land pooling and collective management,** ensuring that farmers retain their ownership rights while benefiting from joint production.

**Conclusion -**

- **While digitisation can assist in modernising land administration**, it is only one piece of the puzzle.
- **Without addressing the complex web of conflicting laws**, regulatory restrictions, and administrative inefficiencies, **India will not be able to fully unlock the potential of its land resources for economic development and social equity.**
- **True progress will only be achieved through a combination of legal reforms and technological advancements,** paving the way for a more inclusive and productive land governance system.

**Source** - **The Indian Express**

**QUESTION - India's land governance system is often considered a barrier to the country's economic and social development due to various legal, institutional, and administrative challenges. Discuss the limitations of digitisation in addressing these challenges, and**

**suggest comprehensive reforms that could unlock the potential of India's land resources for inclusive development.**

## India's Cyber-Physical Hubs

**India has witnessed a significant transformation in its technological landscape, with innovations ranging from drone swarm displays at national events to indigenous system-on-chip (SoC)** production for secure IoT environments.
These **diverse accomplishments are part of the Government of India's National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS),** an ambitious initiative launched in December 2018 by Prime Minister Narendra Modi.
It is **important to have an assessment on the engine behind the mission, key achievements of Innovation hubs and future directions.**

**National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) -**

- With a budget outlay of Rs 3,660 crore, **the mission aims to position India as a global leader in Cyber-Physical Systems (CPS).**
- It is a **domain that integrates the physical world with computational systems.**
- **CPS includes critical sectors such as artificial intelligence (AI), machine learning (ML), robotics**, cybersecurity, and autonomous navigation.
- What sets this mission apart is its **emphasis on translational research, which bridges the gap between theoretical studies and practical,** market-ready solutions.

**The Engine Behind the Mission: Translational Research and Innovation Hubs -**

- The **core strategy of the NM-ICPS lies in the creation of Technology Innovation Hubs (TIHs)** across 25 academic and research institutions, each focusing on thematic domains.
- These **hubs are unique in that they operate as Section 8** (of the Companies Act 2013) **companies**, giving them operational autonomy and a purpose-driven focus.
- **This structure is pivotal in transforming research into high technology readiness level (TRL)** products that are aligned with national priorities.
- The **results have been nothing short of remarkable: within just six years, the initiative has resulted in the creation of over 1,500 new technologies and products,** leading to the formation of **650 startups and spinoff companies.**
- Collectively, **these ventures have generated over 16,000 jobs and trained 1,50,000 people in entrepreneurship,** showcasing the mission's impact on both technological and socio-economic fronts.

**Key Achievements of the Innovation Hubs -**

- C3iHub at IIT Kanpur **—**
- Several innovation hubs under the NM-ICPS have spearheaded transformative projects that have strengthened India's technological infrastructure.
- For instance, the **C3iHub at IIT Kanpur has developed a Security Operations Centre (SOC)** designed **to protect critical infrastructure such as power plants and water treatment facilities from cyber threats.**
- This **SOC integrates advanced technologies like real-time risk assessment, malware analysis, and intrusion detection,** and is cost-effective compared to global competitors.
- **It has been rigorously tested using industry-scale test beds**, which makes it a robust solution for safeguarding both Information Technology (IT) and Operational Technology (OT) assets.
- TiHAN Foundation at IIT Hyderabad **—**
- The **TiHAN Foundation at IIT Hyderabad specialises in autonomous navigation technologies**, providing a state-of-the-art testbed for both aerial and terrestrial systems.

- This **facility is equipped with advanced features such as rainfall simulators and V2X (vehicle-to-everything) communication systems**, making it a versatile platform for testing Autonomous Ground Vehicles (AGVs) and Unmanned Aerial/Surface Vehicles (UAVs/USVs).
- **With collaborations involving institutions like Texas A&M and Tata Technologies, TiHAN has achieved a technology readiness level of nine**, making it a leader in autonomous navigation research and commercialisation efforts.
- AWaDH hub at IIT Ropar **—**
- In the realm of sustainable agriculture and water management, the **AWaDH hub at IIT Ropar has developed groundbreaking technologies like the world's first 'Digital Entomologist,'** which leverages AI for pest detection and management.
- **Other innovations include an AI-powered Livestock Management System** and Nanobubble Technology for water purification.
- **AWaDH's technologies have international reach, with solar-powered biodiversity sensors deployed in countries** like Switzerland, Australia, and the United States **to create a Biodiversity Index of Farms.**

**Startups Driving Innovation and Market Adoption -**

- Botlabs Dynamics **—**
- The innovation hubs **have developed several startups** that are making significant contributions across various sectors.
- For example, **Botlabs Dynamics**, incubated by the I-Hub Foundation for Cobotics at IIT Delhi, has commercialised drone-swarming technology.
- **Valued at over Rs 160 crore, this startup is a success story** in both the defence and entertainment sectors.
- COMRADO Aerospace **—**
- Another notable startup is **COMRADO Aerospace**, which specialises in UAVs for highaltitude, long-endurance surveillance.
- **Incubated at ARTPARK at IISc Bangalore, COMRADO Aerospace is a key player in the defence sector,** offering cost-effective solutions for extreme weather conditions.
- Mindgrove Technologies **—**
- **Mindgrove Technologies**, developed at the Pravartak Technology Foundation at IIT Madras, has created India's first commercial chip designed for secure IoT environments.
- This **System-on-Chip (SoC) is based on open-source RISC-V architecture and offers a 30% cost advantage over competitors.**
- The **chip is now used in various smart devices, including smartwatches and electric vehicle** battery management systems.
- **Ayu Devices at IIT Bombay**: Meanwhile, **Ayu Devices**, incubated at IIT Bombay, **has developed AyuSynk, a Bluetooth-enabled digital stethoscope that amplifies heart and lung sounds up to 60 times**, improving diagnostic accuracy in primary healthcare.

**Future Directions -**

- Towards Self-Reliance and Global Leadership **—**
- The **NM-ICPS has made significant strides in developing technological advancements that meet both domestic and global needs.**
- As the mission progresses, **its innovation hubs are expected to move toward financial autonomy** by commercialising their research outputs.
- **Indian industries have a crucial role in this process by co-creating innovations and funding new projects,** further integrating research with real-world applications.
- Generative AI for Bharat **—**
- One of the most exciting upcoming projects under the NM-ICPS is '**Generative AI for Bharat**,' a **collaborative effort to develop multilingual and multimodal AI models in 22 Indian languages.**

- This initiative, **spearheaded by IIT Bombay, involves public, private, and academic sectors, and promises to have far-reaching implications** for India's technological ecosystem.

**Conclusion -**

- **The NM-ICPS is not just about technological innovation but also about shaping India's future** as a self-reliant and globally competitive nation.

- **By bridging the gap between research and commercialisation, the mission has the potential to revolutionise key sectors such as defence, healthcare, agriculture**, and autonomous navigation.
- **Its continued success will play a pivotal role in driving India's economic growth, improving societal well-being, and positioning the country as a leader in CPS technologies** on the world stage.

**Source** - **The Indian Express**

**QUESTION - Critically analyse the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) as a catalyst for technological transformation in India. Discuss its key achievements, challenges, and future prospects in positioning India as a global leader in emerging technologies.**

## 10 Years of Swachh Bharat Mission

The Swachh Bharat Mission (SBM), launched by Prime Minister Narendra Modi in 2014, marks its 10th anniversary on October 2, 2024. The campaign aimed to fulfill Mahatma Gandhi's vision of a clean India, with the goal of achieving this by his 150th birth anniversary in 2019.

**Swachh Bharat Mission (SBM)** -

- **About —**
- SBM was launched in 2014 to achieve an open defecation free (ODF) India in five years.
- This progressed the country towards SDG 6.2, which aims for adequate and equitable sanitation access for all, especially for women and girls.
- The mission sought to transform sanitation and waste management across India through both infrastructure development and cultural shifts toward cleanliness.
- **Two parts of the mission —**
- **SBM-Gramin** for rural areas, managed by the Ministry of Drinking Water and Sanitation, and
- **SBM-Urban** for cities, overseen by the Ministry of Housing and Urban Affairs.
- **Focus area —**
- **Building individual household toilets —** To eliminate open defecation by providing toilets to all households.
- **Creating community and public toilets —** Especially in high-traffic or underserved areas where individual toilets may not be feasible.
- **Solid waste management —** Efficiently handling waste collection, segregation, and disposal to improve cleanliness.
- **Awareness and behavioural change campaigns —** Promoting the importance of cleanliness and hygiene to encourage lasting changes in public behaviour.
- **Targets of SBM —**
- SBM was launched with the goal of eliminating open defecation by constructing millions of household and community toilets.
- The ODF definition required that no one in a city or ward is found defecating in the open at any time of day.
- The mission focused on providing every household with individual toilets, cluster toilets for communities, and proper waste management systems for school and anganwadi toilets.
- To support this, the government increased assistance from Rs 10,000 (under the previous Nirmal Bharat Abhiyan) to Rs 12,000 per toilet.
- After the mission's initial five years, **SBM 2.0 was launched in 2021**, shifting the focus to creating garbage-free cities and addressing faecal sludge, plastic waste, and greywater management for enhanced urban sanitation.

**Achievements of Swachh Bharat Mission** -

- Toilet Construction and ODF Declarations —

- **Toilets Built —** Over **10 crore toilets** have been constructed under the mission.
- **ODF Villages —** On October 2, 2019, **6 lakh villages** were declared open defecation-free (ODF).
- **Urban ODF Status —** By December 2019, urban India, except for cities in West Bengal, was also declared ODF by the Ministry of Housing and Urban Affairs.
- Targets and Financial Support **—**
- **Individual Toilets —** A total of **66 lakh individual toilets** were constructed, surpassing the target of **59 lakh**.
- **Financial Assistance —** The Centre released **Rs 57,469.22 crore** to states and Union Territories for SBM-Gramin from 2014-2015 to 2018-2019. The budget for SBM-Urban was **Rs 62,009 crore**.
- ODF+ Achievements **—**
- **ODF+ Declarations — 5.54 lakh villages** and **3,913 cities** have been declared ODF+ under SBM-Gramin 2.0 and SBM-Urban 2.0 since 2020-21.
- ODF+ status indicates these areas also have arrangements for liquid waste management.
- Future Plans and Allocations **—**
- **SBM-G 2.0 Budget —** The Cabinet approved spending of **Rs 1.40 lakh crore** for SBMGramin 2.0 from 2020-21 to 2024-2025, with **Rs 52,497 crore** allocated from the Drinking Water and Sanitation Department.
- **SBM-U 2.0 Approval —** SBM-Urban 2.0 was approved in 2021 with an allocation of **Rs 1.41 lakh crore**.
- Landfill Remediation Progress **—**
- **Legacy Landfills —** The goal is to clear all **2,400 legacy landfills** in cities by 2025-2026.
- So far, **30%** of the area targeted for clearing has been achieved, and **41%** of the waste remediation goal has been met.
- **Waste Management Statistics —** According to the SBM-U dashboard, **97%** of municipal wards have door-to-door waste collection, and **90%** have achieved **100% segregation at source**.

**Impact of Swachh Bharat Mission on Health -**

- Deaths Averted **--**
- WHO estimated that from 2014 to October 2019, the Swachh Bharat Mission-Gramin (SBMG) could avert approximately **3 lakh deaths** related to diarrhoea and protein-energy malnutrition.
- Prior to SBM, **unsafe sanitation** was responsible for an estimated **199 million cases of diarrhoea annually**, a figure that has been gradually decreasing with the implementation of the mission.
- Link to Infant Mortality Reduction **—**
- A recent study published in Nature found a significant link between the SBM and a reduction in infant deaths.
- The research indicated that the mission may have contributed to **60,000 to 70,000 fewer infant deaths** each year from 2014 to 2020.
- Although there was a general decline in infant mortality from 2003 to 2020, the reduction accelerated after 2015, coinciding with the SBM's initiatives.
- Toilet Access **—**
- According to the **2011 Census**, **53.1%** of households (rural and urban) lacked any form of toilets.
- The extent of improvement in toilet access since then is yet to be assessed, as the **Census 2021** has been delayed.

**Criticism of SBM -**

- Quality of Construction **—**
- **Substandard Toilets —** Many toilets constructed under the SBM have been reported to be of poor quality, lacking proper sanitation facilities, and failing to meet the required standards.

- **Non-Functional Toilets —** Some toilets were built but remain unused or are not functional due to maintenance issues or inadequate water supply. • Data Discrepancies **—**
  **Inflated Numbers —** Critics have pointed out discrepancies in the reporting of ODF declarations and the actual ground situation. Some villages and cities declared as ODF may not meet the criteria for such status.
- **Verification Issues —** The verification process for ODF status has been questioned, with claims that local officials may have exaggerated achievements to meet targets.
- Focus on Infrastructure Over Behaviour Change **—**
- **Lack of Awareness Campaigns —** While the mission emphasises building toilets, critics argue that it has not adequately focused on creating awareness and promoting behavioural changes regarding sanitation practices.
- **Cultural Resistance —** In many areas, social norms and cultural practices regarding sanitation persist, and merely building toilets does not change people's behaviour regarding their use.
- Implementation Challenges **—**
- **Insufficient Monitoring —** There have been calls for better monitoring and evaluation of SBM initiatives at the ground level to ensure effectiveness.
- **Local Government Capacity —** Some local bodies may lack the capacity or resources to implement the mission effectively, leading to challenges in execution.
- Exclusion of Marginalised Groups **—**
- **Accessibility Issues —** Reports indicate that marginalised communities, including Scheduled Castes and Scheduled Tribes, often face barriers to accessing sanitation facilities, thus undermining the mission's objectives of inclusivity.
- **Gender Concerns —** The mission has been criticised for not adequately addressing the specific sanitation needs of women and girls, such as menstrual hygiene management.
- Environmental Concerns **—**
- **Solid Waste Management —** While the mission addresses toilet construction, critics argue that it has not effectively dealt with solid waste management issues, which continue to pose significant environmental challenges.
- **Sustainability Issues —** Some critics highlight that without sustainable practices, such as proper waste disposal and treatment systems, the mission's long-term success may be jeopardised.
- Delayed Census and Lack of Data **—**
- **Impact Measurement —** The delay in the Census 2021 has hindered the ability to measure the true impact of the SBM on sanitation coverage and improvements, leading to concerns over the reliability of available data.

**Source** - **The Indian Express**

**QUESTION - The Swachh Bharat Mission (SBM) has made significant strides in improving sanitation infrastructure and reducing open defecation in India. However, it has also faced criticism in areas such as construction quality, behavioural change, and inclusivity. Discuss the achievements of SBM and critically evaluate the challenges it faces in ensuring sustainable sanitation practices and equitable access to sanitation for marginalised communities.**

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# International Relations

## Storms in East and South China Sea

In recent years, maritime East Asia has become a hotspot for power politics, particularly in the East and South China Seas.
The East China Sea, bordered by China, Taiwan, Japan, and South Korea, has seen repeated tensions over the **Senkaku/Diaoyu Islands**, which are under Japanese control but claimed by

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China.
Meanwhile, the South China Sea, located between China, Taiwan, and five Southeast Asian nations—Vietnam, Malaysia, Brunei, the Philippines, and Indonesia—has emerged as a critical flashpoint.
China has aggressively asserted its territorial claims in this region, escalating disputes and heightening geopolitical tensions across the Indo-Pacific.

**Significance of East China Sea (ECS) and South China sea (SCS) -**

- Significance for China **—**
- **Geopolitical Control —**
- Both seas are crucial for China's defence and military positioning. Control over these waters allows China to project power in the region and safeguard its national security interests.
- The SCS is part of China's "first island chain" defence strategy, forming a buffer against external threats.
- **Territorial Claims —**
- China views the ECS and SCS as integral parts of its territorial sovereignty, with ongoing disputes over islands like the Diaoyu/Senkaku in the ECS and several islets and reefs in the SCS.
- In its 2019 Defence White Paper, China declares that the South China Sea islands and Diaoyu Islands are integral parts of its territory.
- **Trade Routes —**
- South China Sea is one of the world's busiest maritime trade corridors, with an estimated $3.4 trillion in annual trade passing through it.
- Control over this region gives China potential leverage over international shipping routes.
- **Fisheries and Resources —**
- Both the ECS and SCS are rich in fish stocks, a critical resource for China's food security and economy.
- The seas also provide livelihoods for millions in neighbouring countries.
- **Energy Resources —**
- The South China Sea is believed to hold significant reserves of oil and natural gas.
- Securing these resources is vital for China's growing energy demands and for other nations relying on the region's resources.
- Significance for other countries **—**
- **Key maritime route —**
- The key maritime trade routes in East Asia pass through these two seas. Taiwan Strait is a critical maritime choke point.
- **Vital for digital economy —**
- The region is home to undersea cables that are important for the global digital economy.
- **Vital for energy security —**
- As per the U.S. Energy Information Administration, in 2023, 10 billion barrels of petroleum and petroleum products and 6.7 trillion cubic feet of liquefied natural gas passed through the South China Sea.
- It is also home to vast reserves of untapped oil and natural gas.
- **Global Security —**
- The East and South China Seas are flashpoints for potential conflict.
- It is drawing global attention from powers like the U.S., which conducts Freedom of Navigation Operations (FONOPs) to challenge China's maritime claims.
- These tensions affect global trade, security alliances, and regional stability in the IndoPacific.

**Posture taken by China in this region -**

- **China aggressively pushing its territorial claims in both seas in two ways —**
- by building defence-related infrastructure such as ports, military installations, airstrips, and artificial islands and

- by pushing back against the claims of regional countries.
- **East China Sea Tensions —**
- In the East China Sea, China has aggressively contested Japan's control over the Senkaku/ Diaoyu Islands, leading to multiple crises.
  Notable incidents include the arrest of a Chinese fishing captain in 2010 and Japan's nationalisation of the islands in 2012.
- Both countries took maximalist positions, and China responded by banning rare earth mineral exports to Japan.
- While tensions have slightly eased in recent years, 2023 witnessed the highest level of Chinese Coast Guard activity near the islands, signaling ongoing disputes.
- China's assertive foreign policy has strained its relations with South Korea, Taiwan, and Japan.
- **South China Sea Power Asymmetry** —
- In the South China Sea, China's growing power has resulted in increased military presence and aggression towards claimant countries such as Vietnam, Malaysia, the Philippines, and Brunei.
- With the world's largest navy by numbers, China has conducted "grey zone" operations that involve harassment tactics like ramming vessels, using water cannons, and military-grade lasers, short of initiating full-scale conflict.
- **Philippines-China Tensions —**
- Tensions between China and the Philippines have intensified since 2022, especially around Second Thomas Shoal and Sabina Shoal.
- China has repeatedly disrupted the Philippines' resupply missions. China's heavier and larger Coast Guard ships frequently ram smaller Philippine vessels, creating risks of miscalculation.
- The growing frequency of these incidents, including clashes in mid-2024, reflects China's determination to assert its dominance.
- **Strategic Alignment and Legal Rejection —**
- In July 2024, China conducted joint naval exercises with Russia in the South China Sea, showcasing its geopolitical alliances.
- Despite a 2016 ruling by the Permanent Court of Arbitration rejecting China's territorial claims in the South China Sea, China continues to dismiss the legal decision, maintaining its aggressive posture in the region.

**Regional Responses to China's Aggression in the East and South China Seas -**

- **Strengthening Defence Capabilities —**
- Countries in the Indo-Pacific have ramped up their military expenditures to counter China’s growing power.
- Japan aims to double its defence budget by 2027, and the Philippines has acquired BrahMos anti-ship missiles from India as part of its defence buildup.
- **Active Responses at Sea —**
- Since 2022, the Philippines has pushed back against China’s activities, publicising incidents and filming Chinese vessels to shape perceptions.
- They have also involved international journalists in documenting Chinese behaviour in the West Philippine Sea, turning public diplomacy into a strategic tool.
- **Narrative Battle —**
- Countries are engaging in a battle of narratives, using public diplomacy and media to highlight China’s aggressive actions and gain international support.
- **Strengthening Alliances with the U.S. —**
- Allies like the Philippines, Japan, and South Korea have strengthened their defence ties with the U.S.
- Cooperation between the U.S. and the Philippines in the South China Sea has reached “historic levels,” with increased base access, training, and joint exercises.
- A broader multilateral cooperation dubbed the ‘Squad’ involves the U.S., Australia, Japan, and the Philippines.
- **Trilateral Cooperation —**

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- The U.S., Japan, and South Korea have deepened their trilateral defence relationship, with their Defence Ministers meeting for the first time in July 2024.
- They oppose any unilateral attempts to alter the status quo in the Indo-Pacific and emphasise adherence to international law, including freedom of navigation.

**Source** - **The Hindu**

**QUESTION - Analyse the geopolitical significance of the East and South China Seas for the region and beyond. Examine China's assertive stance in these waters, including its territorial claims and military activities. Discuss the regional responses to China's actions, including the role of international alliances and cooperation. What are the implications of these developments for global security and stability?**

## Gandhi embodied UN Charter Principles

**Mahatma Gandhi's philosophy of non-violence has left an enduring mark on global history,** influencing great leaders such as Martin Luther King Jr. and Nelson Mandela.
**Gandhi's ideas continue to resonate deeply with people worldwide,** shaping the way we confront modern challenges.
**His life and legacy offer invaluable lessons on peace, sustainability, and human dignity, which are increasingly relevant** as humanity faces some of the most pressing issues of the 21st century.

**Mahatma Gandhi's Legacy, Vision, and Philosophical Depth of Non-Violence -**

- Non-Violence as a Strategy for Change **—**
- Gandhi's **strategic application of non-violence was revolutionary in its simplicity and effectiveness** and his belief that **means and ends are inseparable was central to his approach.**
- He **emphasised that using violent methods, even for a just cause,** would only perpetuate cycles of violence and injustice.
- **Non-violence, according to Gandhi, is the only way to create a society grounded in peace,** mutual respect, and fairness.
- Gandhi's use of non-violence was **most famously demonstrated in India's struggle for independence from British colonial rule.**
- The Satyagraha Campaign During India's Independence Struggle **—**
- Through various **peaceful campaigns such as the Salt March (1930) and the Quit India Movement (1942), he mobilised millions of Indians** to resist British oppression without resorting to violence.
- His approach, termed **Satyagraha, or truth force, called for civil disobedience and noncooperation with authorities** that enforced unjust laws.
- Gandhi believed that **truth and moral righteousness could win over even the most powerful adversary,** without the need for physical confrontation.
- The Philosophical Depth of Non-Violence **—**
- **At the core of Gandhi's non-violence was his deep spiritual conviction** that all life is interconnected.
- He was **influenced by a variety of spiritual traditions, including Hinduism, Jainism, and Christianity**, all of which emphasise compassion, non-harm, and the sacredness of life.
- **For Gandhi, non-violence was not merely the absence of physical aggression; it was an attitude of love, forgiveness, and empathy** even toward one's enemies.
- This idea can be understood in Gandhi's belief that **non-violence is more powerful than violence because it requires greater courage and inner strength.**
- Non-Violence Beyond Politics **—**
- Gandhi's philosophy of non-violence **extends far beyond political movements.**

- He **envisioned a society where non-violence would permeate all aspects of life,** from personal relationships to community interactions and international diplomacy.
- In his view, **non-violence was not just a strategy for protest but a moral framework for living**.
- This meant fostering a deep sense of compassion, tolerance, and respect for all beings.
- The Vision of Sarvodaya **—**
- His commitment to **non-violence was closely linked to his vision of Sarvodaya, or the welfare of all.**
- Gandhi **believed that a truly just society could only emerge when individuals were committed to the well-being of others**, particularly the poor and marginalised.
  He was **an advocate for the concept of trusteeship,** where the wealthy and powerful would act as stewards of their resources for the common good, rather than for personal gain.
- This **economic vision was deeply intertwined with his moral commitment to nonviolence,** as it **sought to address the root causes of violence; inequality, exploitation, and greed**.

**The Global Impact of Mahatma Gandhi's Non-Violence -**

- Martin Luther King Jr. Fight Against Racism in the US **—**
- Martin Luther King Jr. **called Gandhi's approach the guiding light of his own non-violent resistance against racial injustice.**
- **King's leadership during the Civil Rights Movement in the 1950s and 60s,** particularly during events like the Montgomery Bus Boycott and the Selma to Montgomery marches, **mirrored Gandhi's emphasis on civil disobedience and peaceful protest.**
- **King believed, like Gandhi, that non-violence was not a sign of weakness, but a way to create moral clarity** and expose the injustices of the existing social order.
- Nelson Mandela's Fight Against Apartheid in South Africa **—**
- **Similarly, Nelson Mandela, though initially advocating for armed resistance, eventually embraced non-violence** as a powerful strategy to dismantle apartheid in South Africa.
- **Mandela recognised the potential of Gandhi's methods** to unite people in a common cause without deepening divisions through violence.
- **Gandhi's influence on Mandela helped transform the anti-apartheid struggle into a global movement** grounded in principles of justice, equality, and non-violence.

**Challenges to Non-Violence in the Modern World -**

- While **Gandhi's philosophy of non-violence** remains influential, **applying it in today's complex, fast-paced world is not without challenges.**
- **Global conflicts, terrorism, and systemic inequalities often lead to violent responses**, and non-violent approaches can seem slow or ineffective in the face of immediate danger.
- However, **Gandhi's legacy teaches us that non-violence is not a quick fix, but a long-term commitment** to building a more just and peaceful world.
- **It requires patience, resilience, and a belief in the power of moral force** to create lasting change.
- **In a world grappling with climate change,** rising inequality, and political polarisation, **Gandhi's message of non-violence offers a path forward.**
- His **belief in resolving conflicts through dialogue, empathy, and cooperation remains relevant** in addressing today's global crises.
- Moreover, **his insistence on non-violence as a way of life challenges individuals and societies to reconsider their relationships with one another** and with the planet.

**Mahatma Gandhi's Relevance in Addressing Contemporary Challenges -**

- The Climate Crisis **—**
- **One of the most critical challenges** facing humanity today is the climate crisis.
- **If the world fails to meet the targets set in the Paris Climate Agreement, the consequences will be catastrophic** for both humanity and the planet.

- **Gandhi's philosophy of living in harmony with nature is especially relevant** in addressing this crisis.
- His belief that **the Earth provides enough to satisfy everyone's needs, but not everyone's greed is a timely reminder** of the need for sustainable consumption and conservation of resources.
- In recognition of this, **when India ratified the Paris Climate Agreement on October 2, 2016, it symbolically honoured Gandhi's legacy** by committing to global climate action.
- Sustainable Development and Poverty Eradication **—**
- A second **major challenge is the pursuit of sustainable development.**
- Despite significant progress, **many countries still struggle with poverty, hunger, and inequality.**
- The **UN's Sustainable Development Goals (SDGs), adopted in 2015, seek to address these issues** by promoting inclusive economic growth, gender equality, and access to education and health services.
- **Gandhi's principles can guide us in our efforts to build a more equitable and sustainable world.**
- **His focus on self-sufficiency, economic justice, and the importance of uplifting the poor aligns with the SDGs' objectives.**
- Countries that have successfully reduced poverty and hunger, such as India, serve as examples of how commitment to these values can bring about meaningful change.
- The Loss of Spiritual Knowledge **—**
- While the world has made tremendous advancements in science and technology, **spiritual well-being has not kept pace.**
- **Material prosperity alone does not lead to peace or happiness**; there is a growing need for compassion, understanding, and mutual respect in our increasingly diverse societies.
- **Gandhi's teachings emphasise the importance of spiritual knowledge** as a foundation for peace and harmony.

**Conclusion -**

- **Mahatma Gandhi's philosophy of non-violence, his commitment to sustainability,** and his advocacy for spiritual growth **offer a timeless blueprint for confronting the challenges of the 21st century.**
- **As the world grapples with the climate crisis, rising inequality**, and a loss of spiritual connection, **his teachings remind us of the importance of compassion, cooperation, and ethical leadership.**

**Source -** The Indian Express

**QUESTION - Mahatma Gandhi's philosophy of non-violence not only shaped India's struggle for independence but also left an indelible impact on global movements for civil rights and justice. In the context of today's pressing challenges such as climate change, inequality, and political polarisation, critically examine the relevance of Gandhi's ideas on non-violence, sustainability, and human dignity in addressing contemporary global crises. Illustrate your answer with suitable examples.**

# GENERAL STUDIES - III

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# Economy

## How to deal with National Security Risk from FDI and trade?

The **debate over Chinese foreign direct investment (FDI) into India oscillates** between the **economic benefits and potential security risks.**
This **discourse is critical, as it not only addresses the immediate concerns of economic competition and sovereignty** but also prompts the question of **whether India has an adequate legislative framework to manage FDI** and international trade in the context of national security. Despite widespread discussion, **the answer remains that India lacks a comprehensive legal structure** to address these concerns effectively.

**India's Existing FDI Regulation: Press Note 3 (PN3) -**

- **India's approach to regulating FDI underwent a significant shift in April 2020,** when the government **introduced Press Note 3 (PN3) in response to economic vulnerabilities** worsened by the COVID-19 pandemic.

- PN3 is enforced through the **Foreign Exchange Management Act (FEMA)** — a law that provides the architecture for the orderly development and maintenance of the foreign exchange market in India.
- **PN3 represents a crucial regulatory measure designed to curb opportunistic takeovers** of Indian companies by foreign investors, particularly from neighbouring countries.
- While the pandemic weakened several sectors of the Indian economy, **there was growing concern that foreign investors, especially from China, might exploit the situation by acquiring distressed Indian companies.**
- **PN3 was seen as a protective response to these concerns,** but its scope and impact are much broader, with profound implications for India's FDI policy.

**Key Features of PN3 -**

- Geographical Focus **—**
- While many countries share land borders with India, **the primary target of this regulation was China,** given the growing economic and geopolitical tensions between the two nations.
- **China had been a significant investor in various sectors of the Indian economy**, including technology, manufacturing, and infrastructure.
- **PN3 sought to limit this influence** by increasing the scrutiny of Chinese investments.
- Scope of the Regulation **—**
- **PN3 applies to both new investments and changes in ownership** of existing investments.
- This **means that even if a company was already operating in India with foreign investment, any future changes in shareholding or ownership would require government approval** if the investment originated from a bordering country.
- This **aspect of the regulation was designed to prevent indirect acquisitions or changes in control** of Indian companies.

**Strategic Importance of PN3 in India's FDI Policy -**

- Geopolitical Context **—**
- The introduction of PN3 should be understood **in the context of India's broader geopolitical strategy.**
- Relations between India and China have been fraught, particularly considering border disputes, trade imbalances, and strategic competition in the Indo-Pacific region.
- **By tightening control over Chinese investments, India is asserting its economic sovereignty** and reducing the risk of foreign entities exerting undue influence on its domestic industries.
- Economic Protectionism vs. National Security **—**
- PN3 **reflects a growing trend of economic protectionism** driven by national security concerns.
- While traditionally, **FDI has been seen as a means of fostering economic growth and development, PN3 represents a shift towards a more cautious and defensive stance**, where security considerations take precedence over economic liberalisation.
- This **shift aligns India with other major economies, such as the US, Canada, and Australia,** which have also introduced measures to screen FDI based on national security concerns.

**Limitations and Criticisms of PN3 -**

- Absence of Direct National Security Provisions **—**
- **One of the major limitations of PN3 is its failure to explicitly mention national security** as a basis for restricting FDI.
- Although national security concerns are clearly the driving force behind the regulation, **the lack of explicit language leaves India's FDI regime vulnerable to legal challenges.**
- In the absence of a well-defined national security law, **the reliance on FEMA to screen FDI for security risks may not be legally sufficien**t in international arbitration or dispute resolution settings.

- Impact on Business and Economic Relations —
- The **requirement for prior government approval can slow down investment processes** and may act as a deterrent for foreign investors.
- By creating additional layers of bureaucracy, **PN3 potentially hampers the ease of doing business**, particularly for companies that may not pose any security risks but are still subject to the same scrutiny as those from countries with a contentious relationship with India, like China.
- For instance, **investments from friendly neighbouring countries, such as Bhutan or Nepal, are subjected to the same regulations,** even though they do not pose significant security concerns.
- Targeted at China but Broader in Scope —
- While PN3 was largely seen as a response to Chinese investments, **the regulation applies to all land-bordering countries, many of which have friendly relations with India.**
- This **broad-brush approach has raised concerns** that it may unnecessarily restrict beneficial investments from countries like Nepal, Bhutan, and Bangladesh.
- This **general application could hinder regional cooperation and economic integration,** especially when such investments do not raise security alarms.
- Indirect Effects on Multinational Corporations (MNCs) —
- PN3 could have an impact on MNCs with Chinese ownership or investments, even if these companies are headquartered in countries outside the region.
- For example, **if a U.S. or European company with significant Chinese shareholding wants to invest in India, it may be subject to the same scrutiny** as a direct Chinese investor.
- **This could complicate the investment landscape** for global companies that have complex ownership structures, creating uncertainty and additional compliance burdens.

**The Need for a Coherent Approach to FDI and National Security -**

- A Legal Disconnect —
- The **disparity between India's domestic legal framework and its international treaty obligations further underscores the need for a more coherent approach to FDI** and national security.
- **India's past and current international investment treaties**, such as the 2015 Model Bilateral Investment Treaty (BIT), **include specific provisions for managing issues related to foreign exchange and national security.**
- For example, **Article 6 of the BIT deals with exchange control issues, while Article 33 allows the state to take measures to protect national security**, even if these actions violate the treaty's substantive provisions.
- The Broader Legal Vacuum in India's National Security Legislation —
- India's legal gap **extends beyond FDI to encompass international trade as well.**
- A **notable example is India's response to the Pulwama terror attack in February 2019, which led to the imposition of 200 percent customs duties on Pakistani imports**.
- The **measure was justified on the grounds of national security, yet India invoked Section 8A (1) of the Customs Tariff Act** — a provision designed for economic emergencies, not for security threats.
- This **reflects a broader pattern in which India repurposes existing economic laws to address national security concerns**, rather than developing dedicated legislation for such scenarios.

**Way forward -**

- The **ongoing debate about the security risks posed by Chinese FDI presents an opportunity to launch a broader national discussion** on the need for a comprehensive legal framework that aligns with global best practices.

- **Countries like Canada and Australia have demonstrated the importance of having dedicated laws** to manage the national security risks associated with FDI and international trade.
- **India should follow suit by developing legislation** specifically designed to address these concerns.

**Conclusion -**

- While India has taken steps to manage foreign investment through regulations like PN3, **the absence of a comprehensive national security framework remains a critical gap.**
- **As India continues to attract FDI and engage in global trade, it is imperative that the country develops a clear legal mechanism** to safeguard its national security.
- By learning from the practices of other nations and aligning its domestic laws with its international treaty obligations, **India can better protect its sovereignty and economic interests in the face of emerging global challenges.**

**Source - The Indian Express**

**QUESTION - India's approach to regulating foreign direct investment (FDI) has evolved in recent years, particularly in response to concerns about national security. Critically analyse Press Note 3 (PN3) and its implications for India's FDI policy. Discuss the strengths, weaknesses, and potential unintended consequences of this regulation. Evaluate the need for a more comprehensive legal framework to manage FDI and international trade in the context of national security.**

# Reforming the Insolvency and Bankruptcy Code

According to the G20 Sherpa and former CEO of Niti Aayog (Amitabh Kant), the Insolvency and Bankruptcy Code (IBC) is in need of second-generation reforms to acknowledge concerns regarding the present functioning of the Code.

**What is the Insolvency and Bankruptcy Code (IBC)?**

- **Insolvency vs Bankruptcy —** While insolvency results from an inability to pay debts due to a lack of assets, bankruptcy occurs when an application is presented to an authority declaring insolvency and requesting to be declared bankrupt, which will last until discharge.
- **About the IBC 2016 —**
- It is the bankruptcy law of India which seeks to **consolidate the existing framework** by creating a single law for insolvency and bankruptcy.
- It is **a one stop solution** for resolving insolvencies which previously was a long process that did not offer an economically viable arrangement.
- It **aims to protect the interests of small investors** and make the process of doing business less cumbersome.
- **About IBBI —**
- **It is the regulator for overseeing insolvency proceedings** and entities like Insolvency Professional Agencies (IPA), Insolvency Professionals (IP) and Information Utilities (IU) in India.
- **It was established on 1 October 2016** and given statutory powers through the IBC 2016.
- It functions under the **Ministry of Corporate Affairs** and **covers** Individuals, Companies, Limited Liability Partnerships and Partnership firms.

**What is the Process Followed under the IBC?**

- When a corporate debtor (CD) or a company, which has taken loans to run its business, defaults on its loan repayment, either the creditor or the debtor can apply for the initiation of a CIRP.
- CIRP stands for **Corporate Insolvency Resolution Process (CIRP)**, which comes under Section 6 of the IBC.
- Earlier, the minimum amount of default after which the creditor or debtor could apply for insolvency was ₹1 lakh.

- But, considering the stress on companies amid the pandemic, the government increased **the minimum amount to ₹1 crore**.
- **To apply for insolvency**, one has to approach a stipulated adjudicating authority (**AA**) under the IBC. The various benches of the National Company Law Tribunal (**NCLT**) across India are the designated AAs.
- **The Tribunal has 14 days to admit or reject** the application or has to provide a reason if the admission is delayed.
- The CIRP or resolution process begins once an application is admitted by the AA. The amended mandatory deadline for the completion of the resolution process is **330 days.**

**Issues Faced in the Implementation of the IBC -**

- **Delay in resolving bankruptcy cases —**
- The IBC aims to resolve bankruptcy cases within a set time frame, but the average time taken to complete the process is longer than the stipulated 330 days.
- Time taken for insolvency resolutions at the NCLT averaged **716 days in FY24**, up from 654 days in FY23.
- **Low approval rate —**
- Only a small percentage of cases end with approved resolution plans. Average time taken for the admission of cases increased to **650 days in FY22** from 468 days in FY21.
- Even after approval, final resolution plans are often challenged, which can lead to further delays.
- **High number of liquidations —** A large number of cases end up in liquidation, which goes against the IBC's goal of resolving bankruptcy.
- **Low recovery rates —**
- There is an inverse relationship between the time taken for resolution and the value recovered, highlighting that delays are eroding creditor recoveries.
- The rate of recovery for creditors as a percentage of admitted claims **fell to 27% in FY24** from 36% in FY23.
- **Lack of operational NCLT benches —** Many NCLT benches are not fully operational due to a lack of infrastructure and support staff.
- **Issues with valuers —** Some stakeholders have raised concerns about the credibility of valuers enlisted as registered valuers by IBBI.
- **Ambiguity in definitions —** The definitions of liquidation value and other concepts are ambiguous, and court judgments contradict each other.

**First Generation Reforms to Strengthen IBC -**

- Ever since IBC was enacted and IBBI was formed, consistent efforts were made to make it a potent debt resolution tool for bringing cultural shift towards loan repayments.
- **Several amendments** were made to make it more effective as the law experienced hiccups on its way to implement it.
- **For example,** the motive behind introducing the IBBI (Insolvency Resolution Process for Corporate Persons) (2nd Amendment) Regulations 2023 is to facilitate the smooth functioning of the CIRP.

**Way Ahead - Suggestions Given by Amitabh Kant to Strengthen IBC -**

- Speaking at the IBBI's annual meeting, Kant called for a **second generation of reforms** to strengthen the IBC 2016. • India must consider -
- **Outsourcing court management** for insolvency proceedings to private players (like in the case of **Passport Seva Kendras** that are operated by TCS Ltd) to cut delays and boost creditor recovery.
- **Amending the IBC** to clarify key legal principles and enable the implementation of a crossborder insolvency framework.

**Source** - **Multiple**

**QUESTION - The Insolvency and Bankruptcy Code (IBC), 2016, has been a landmark reform aimed at improving the ease of doing business and resolving insolvency issues in a**

**timebound manner. However, challenges such as delays in case resolutions, low recovery rates, and a high number of liquidations have hindered its effectiveness. Critically examine the key issues faced in the implementation of the IBC. Also, suggest second-generation reforms that could address these challenges and strengthen the IBC's functioning.**

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# Science and Technology

## Private participation in India's nuclear energy sector

The **Union Budget for FY 2024-25 included a proposal for partnerships with the private sector to research and develop Bharat Small Reactors (BSR), Bharat Small Modular Reactors (BSMR),** and other nuclear energy technologies.
This **move is aligned with India's broader goal of generating 500 Gigawatts of non-fossil fuel energy by 2030,** as pledged at the COP26 Summit in 2021.
However, **this ambitious plan faces numerous legal, regulatory, and financial hurdles** that must be addressed for the successful involvement of private entities in the nuclear sector.

**Existing Legal Framework -**

- Existing Legal Framework **—**
- India's nuclear energy sector **operates under a stringent regulatory framework**, primarily governed by the **Atomic Energy Act, 1962 (AEA).**
- The **AEA grants exclusive control over nuclear energy activities to the central government,** which **executes these through designated authorities or companies**, such as the Department of Atomic Energy (DAE) and the Nuclear Power Corporation of India Limited (NPCIL).
- This **centralised control has historically limited private sector involvement to specific roles,** primarily in **engineering, procurement, and construction (EPC) services**, while excluding private entities from core activities like research and development (R&D).
- SC's Decision on Private Sector Participation **—**
- In a significant legal development, the **Supreme Court of India recently upheld the provisions of the AEA in the case Sandeep T.S. vs Union of India (September 2024).**
- The **judgement dismissed a petition challenging the law's restrictions on private sector participation** in nuclear power licensing.
- The **Court emphasised the importance of stringent safeguards** due to the potential risks associated with atomic energy.
- This **ruling reinforces the central government's dominance over nuclear energy activities**, which complicates efforts to introduce private players in a meaningful capacity.

**The Current Role of Private Sector -**

- The Current Role of the Private Sector **—**
- **Currently, private companies such as Megha Engineering & Infrastructures and Reliance are involved in nuclear energy projects, but only in non-core areas**, primarily through EPC contracts.
- These **companies build and maintain the physical infrastructure** of nuclear plants, but they are **restricted from engaging in activities related to nuclear material management** or **operations that involve handling radioactive substances.**
- Need for Private Sector Participation: Capital Investment **—**
- The **nuclear sector is highly capital-intensive,** and the scale of investment required for further expansion, especially with advanced technologies like BSR and BSMR, is enormous.
- The **NITI Aayog has estimated that nearly $26 billion of private investment will be needed** to develop the nuclear sector to meet India's energy goals.
- **Given the financial burden on the government, involving private firms in more substantial roles could provide the necessary capital,** technical expertise, and innovation.

- However, **such participation is currently prohibited under Section 3(a) of the AEA,** which bars private companies from producing or utilising atomic energy, keeping R&D activities strictly under government control.
- The Government's Proposal **—**
- The **government's proposal to invite private participation in nuclear R&D**, as announced in the Union Budget 2024-25, therefore, **clashes with the prevailing legal restrictions.**
- While the **announcement signals a policy shift**, any real progress would require substantial amendments to the AEA or the creation of a legal framework.
- The **new provisions should balance the involvement of private entities with government oversight to mitigate risks** related to nuclear safety, security, and liability.

**Legal Challenges -**

- Strict Provisions of Atomic Energy Act **—**
- One of the primary legal hurdles for private sector involvement is the **rigidity of the AEA, which monopolises control of nuclear activities** under the government.
- This **legal structure ensures that only government-owned or controlled entities,** such as the NPCIL and the DAE, **manage nuclear energy production.**
- While this structure has maintained a high level of safety and security, **it significantly hampers the ability to leverage private sector efficiency**, innovation, and investment.
- Legal Environment Around Nuclear Safety and Liability **—**
- The **Civil Liability for Nuclear Damage Act (CLNDA) of 2010 is a central piece of legislation designed to provide prompt compensation for victims of nuclear incidents** and to impose liability on the operator (usually the NPCIL).
- The **CLNDA enforces a no-fault liability regime on nuclear operators**, meaning that the operator is liable for damages irrespective of fault.
- **This provision, while intended to protect public safety, also disincentivises private participation** because private entities would likely hesitate to invest in an industry where they may bear enormous liability in case of an accident.
- Complex Regulatory Framework and Lack of Transparency **—**
- **The Atomic Energy Regulatory Board (AERB),** established to monitor radiation safety and regulate nuclear technology, **has faced criticism for lacking independence from the government.**
- The **AERB's perceived lack of autonomy could hinder private investment**, as companies may seek more transparent and impartial regulatory oversight before committing to such a high-risk industry.
- The **Nuclear Safety Regulatory Authority (NSRA) Bill of 2011, which aimed to establish an independent nuclear safety body, has yet to be enacted**, leaving unresolved concerns about regulatory transparency and effectiveness.

**The Path Forward -**

- Public-Private Partnership (PPP) **—**
- A key legal avenue that **could bridge the gap between current regulations and private sector involvement is the creation of PPP** in the nuclear energy sector.
- In a PPP structure, **the government could retain a majority stake, 51% or more, in nuclear projects,** ensuring that control and accountability remain with the state while allowing private companies to contribute capital and technical know-how.
- This **approach would align with Section 3(a) of the AEA,** which limits the involvement of private players, while still leveraging private sector resources for the development of newer nuclear technologies such as SMRs and modular reactors.
- Moreover, **under a PPP structure, projects would be subject to the Right to Information (RTI)** Act, promoting transparency and public accountability.
- By holding the majority stake, **the government would remain responsible for critical decisions and the safety of the reactors**, while **private entities would be involved in more**

**specialised roles such as technology development, innovation**, and infrastructure creation.

- Need for Regulatory Reform **—**
- For private investment to materialise, **regulatory reform is essential.**
- The **role of the AERB, for instance, must be reevaluated** to ensure that it functions with greater independence and impartiality.
- **Investors will only feel confident entering the nuclear sector if they are assured that safety regulations are enforced** by an autonomous and technically competent regulatory body.
- Resolution of Pending Litigation Regarding the CLNDA **—**
- The **ambiguity surrounding nuclear liability creates a significant obstacle** to private sector involvement.
- **A clear and stable legal environment, where liability is well-defined and manageable, will encourage private entities** to participate more actively.
- This **could potentially be achieved through amendments to the CLNDA that clarify the extent of operator liability,** as well as government-backed insurance schemes to cover catastrophic incidents, thereby sharing the burden of liability between the state and private players.

**Conclusion -**

- **India's nuclear energy ambitions** are both **admirable and challenging.**
- The **introduction of private sector participation, especially in the context of BSRs and BSMRs, could provide the financial and technological boost** necessary to achieve the country's decarbonisation goals.
- However, **this shift must be accompanied by comprehensive legislative and regulatory reforms,** particularly in areas such as liability, safety, and transparency.

**Source** - **The Hindu**

**QUESTION - India's ambitions to generate 500 Gigawatts of non-fossil fuel energy by 2030 include exploring advanced nuclear technologies such as Bharat Small Reactors (BSR) and Bharat Small Modular Reactors (BSMR). However, private sector involvement in nuclear energy development faces significant legal, regulatory, and financial challenges. Critically examine the legal framework governing nuclear energy in India and assess the potential role of Public-Private Partnerships (PPP) in overcoming these challenges.**

## Small Modular Nuclear Reactors

As the world grapples with the urgent need to decarbonise energy systems and reduce greenhouse gas emissions, nuclear energy is resurfacing as a critical component of the solution. While traditional nuclear power plants are large and costly to build, Small Modular Nuclear Reactors (SMRs) are emerging as a promising alternative.
These compact reactors offer the potential to provide safe, scalable, and sustainable energy to meet global demands.

**Details -**

- India's ambitions to enter the **Small Modular Reactors** manufacturing value chain are showing positive signs, with **private players expressing interest in deploying these reactors at their captive sites**.
- SMRs, which range between **30 MWe to 300 MWe** per unit, are seen as key to keeping nuclear energy commercially competitive.
- India is positioning itself as a leader in SMRs, both as part of its **clean energy transition** and as a foreign policy initiative.

- **Russia**, a major SMR player alongside **China**, is reportedly looking to expand nuclear cooperation with India in this field.
- Technical discussions are underway to assess the feasibility of SMRs in India, with the **Atomic Energy Act, 1962** guiding policy decisions. The **Indian government is also considering private sector involvement in this sector**.
- Globally, only two SMRs have reached operational status—**Akademik Lomonosov** in Russia and **HTR-PM** in China.
- India aims to emerge as a credible alternative, leveraging its history of operating small reactors and cost-effective nuclear manufacturing capabilities.

**What are Small Modular Reactors (SMRs)?**

- Small Modular Reactors are nuclear reactors designed to generate a small amount of electricity — **typically up to 300 MW per unit**.
- Unlike traditional large nuclear reactors, which generate up to 1,000 MW or more, SMRs are smaller in size, allowing for modular deployment, enhanced safety features, and reduced construction times.
- SMRs operate on the same fundamental principles as traditional nuclear reactors, using nuclear fission to generate heat.
- This heat is then used to produce steam, which drives a turbine to generate electricity.
- Characteristics of SMRs **—**
- **Modularity —** SMRs can be factory-built in modules and transported to the installation site, which significantly reduces on-site construction time and costs.
- **Scalability —** The modular nature allows for flexible scaling, enabling utilities to add capacity as demand grows.
- **Safety Enhancements —** Many SMR designs incorporate passive safety systems, which rely on natural forces like gravity and convection, reducing the need for operator intervention in emergencies.
- **Lower Capital Costs —** Smaller reactors mean lower upfront investments, making SMRs an attractive option for countries and regions with limited financial resources for energy infrastructure.

**Types of SMRs -**

- **Pressurised Water Reactors (PWRs) —** Most SMRs are based on PWR technology, where water is used as both a coolant and moderator.
- **Fast Neutron Reactors —** These reactors use fast neutrons and liquid metal coolants to achieve higher efficiency in fuel use.
- **Molten Salt Reactors (MSRs) —** Instead of solid fuel, MSRs use liquid fuel dissolved in molten salt, offering inherent safety benefits by reducing the risk of meltdown.
- **High-Temperature Gas-Cooled Reactors (HTGRs) —** These reactors use helium as a coolant and can operate at higher temperatures, increasing efficiency.

**Benefits of SMRs -**

- **Safety —**
- SMRs are designed with advanced safety features that significantly reduce the risk of accidents.
- Many designs feature **passive safety systems** that automatically shut down the reactor without human intervention if certain safety parameters are exceeded.
- **Cost-Effectiveness —**
- Traditional nuclear plants are capital-intensive and often face construction delays. SMRs, on the other hand, are designed to be more affordable.
- With their modular design, they can be manufactured in factories and assembled on-site, lowering construction costs and timelines.
- **Scalability & Flexibility —**
- One of the primary advantages of SMRs is their scalability.
- Utility companies can install a single reactor to meet current energy demand and add more modules over time as demand grows.
- This makes SMRs particularly suitable for smaller grids or regions with fluctuating energy needs.

- **Lower Environmental Impact —**
- While nuclear power is already considered low-carbon, SMRs offer further environmental benefits:
- **Reduced Waste Generation —** Some advanced SMR designs are capable of reusing spent nuclear fuel, reducing the volume of radioactive waste.
- **Small Physical Footprint —** SMRs occupy less land compared to traditional nuclear plants, making them easier to site in remote or space-constrained areas.

**Challenges facing SMR Deployment -**

- **Regulatory Hurdles —**
- Nuclear energy, being a highly regulated industry, poses a challenge for SMRs. Existing regulatory frameworks are designed for large nuclear plants, and SMRs will require tailored regulations that account for their smaller size and enhanced safety features.
- **Public Perception —**
- The legacy of nuclear disasters such as Chernobyl and Fukushima continues to impact public perception. Gaining public trust and dispelling myths around the safety of SMRs will be critical for widespread acceptance.
- **High Initial Costs —**
- While SMRs are more affordable than large nuclear plants, the upfront costs are still higher compared to renewable energy sources like wind and solar.
- This can make it difficult to secure investment without clear long-term policy support and financial incentives.
- **Waste Disposal —**
- Although SMRs produce less nuclear waste, the issue of waste disposal remains.
- A comprehensive strategy for handling and storing nuclear waste will be essential for the sustainable operation of SMRs.

**Steps taken by Government to Promote SMRs -**

- **Integration of SMRs into National Energy Plans —** The Indian government has highlighted nuclear energy as a crucial part of its clean energy transition. SMRs, being a flexible and scalable alternative, have been integrated into discussions on future energy policies to diversify the nuclear energy portfolio.
- **Long-term Strategy for Net-Zero —** India's ambitious target of achieving net-zero emissions by 2070 includes nuclear energy as a key component, and the government is increasingly considering SMRs as a clean and safe option for decentralised energy production.
- **Budget Allocations for Nuclear R&D**: The Indian government has allocated funds in its budget to enhance nuclear research, focusing on advanced reactor technologies like SMRs. This funding supports R&D efforts and contributes to infrastructure development.
- In the 2024-25 Indian Budget, the government announced plans to partner with the private sector to develop and set up "**Bharat Small Reactors**", essentially SMRs.

**Source** - **The Indian Express**

**QUESTION - Discuss the significance of Small Modular Reactors (SMRs) in India's energy transition towards decarbonisation. Also, address the potential benefits and challenges associated with the deployment of SMRs in the Indian context, as well as the steps taken by the government to promote their adoption.**

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# Environment

## Tackling Air Pollution

On September 25, Delhi's air quality dropped into the '**poor**' category (AQI 200-300) for the first time since mid-June, marking the start of North India's bad air season.

In response, the Delhi government launched a **21-point Winter Action Plan** to combat pollution, which includes: Drone monitoring of pollution hotspots; Deployment of anti-smog guns; Exploring the possibility of creating artificial rain.
The **Commission for Air Quality Management (CAQM)**, responsible for implementing the **Graded Response Action Plan (GRAP)** in the NCR, is closely monitoring the situation.

**Air Quality Index (AQI)** -

- AQI was launched in October 2014 to disseminate information on air quality in an easily understandable form for the general public.
- The measurement of air quality is based on eight pollutants, namely, PM10, PM2.5, NO2, SO2, CO, O3, NH3, and Pb
- The AQI transforms complex air quality data of various pollutants into a single number for ease of understanding.

**Commission for Air Quality Management (CAQM)?**

- CAQM is a statutory body formed under the Commission for Air Quality Management in National Capital Region and Adjoining Areas, Act 2021.
- The commission aims at better coordination, research, identification, and resolution of problems related to air quality in NCR and adjoining areas.

**Why India's already dangerous air pollution is set to worsen?**

- **India's Air Pollution Crisis Set to Worsen Post-Monsoon —**
- With the southwest monsoon season ending, India's air pollution is expected to deteriorate due to **stagnant air and temperature inversion**, where warm air traps cooler air near the ground, preventing pollutants from dispersing.
- This leads to extremely hazardous levels of PM 2.5 and other pollutants.
- While smog intensifies in winter, poor air quality is a year-round issue that requires sustained and comprehensive action.
- Meteorological conditions, such as temperature inversion and low wind speeds, particularly affect the Indo-Gangetic plain, worsening pollution.
- **Inequality and Air Pollution —**
- Economic inequality exacerbates the crisis, with wealthier citizens able to afford air purifiers or relocate to cleaner areas, while poorer communities face the full impact of toxic air. • This highlights the issue of equity in access to clean air.
- **Various Pollution Sources —**
- India's air pollution crisis stems from multiple, overlapping sources.
- Year-round contributors such as biomass burning for cooking, trash-burning, vehicular emissions, and industrial activity combine with episodic events such as farm stubble burning and festival firecrackers.

**Flaws in the steps taken to address the air pollution in India -**

- **Current strategies —**
- India has adopted several **superficial measures** to combat air pollution, such as **smog towers**, **water guns**, and **odd-even road sharing**.
- The latest "silver bullet" is **cloud seeding**, a technique that disperses chemicals to induce rainfall, temporarily clearing the air.
- These strategies prioritise appearance over addressing the root causes of pollution.
- **Cloud Seeding: Limited Impact and Ethical Concerns —**
- Cloud seeding offers only a **short-term reprieve**, diverting attention from needed **systemic changes**.
- Its environmental and ethical issues include:
- **Redistributing rainfall**, potentially depriving other regions and worsening water scarcity.
- **Chemicals** like **silver iodide** may pose long-term risks to **agriculture and ecosystems**.
- In a country like India, where **water resources** are already strained, cloud seeding risks aggravating **regional disparities**.

- **Flaws of Smog Towers —**
- Smog towers, intended to clean surrounding air, are another flawed solution. Their impact is limited to the immediate area, leaving broader pollution issues unaddressed.
- Furthermore, the energy consumption needed to operate these towers may contribute to additional emissions, potentially making them counterproductive.

**Way forward -**

- India's focus on **cloud seeding** and **smog towers** detracts from addressing air pollution at its source.
- Instead, **science-based solutions** and a **coordinated, multi-sectoral approach** are required.
- **Coordination Among Agencies —**
- Tackling air pollution demands collaboration across government bodies overseeing transport, industry, agriculture, and urban planning.
- For example, addressing crop stubble burning needs cooperation among farmers, policymakers, and regulators. A unified, year-round, nationwide strategy is essential.
- **Capacity Building and Critical Thinking —**
- Building capacity among stakeholders, from researchers to policymakers, and fostering critical thinking are crucial for data-driven solutions.
- Institutional frameworks must be strengthened, with investments in research and air quality monitoring systems across India, including satellite-based and low-cost sensor networks.
- **Beyond Tech-Centric Solutions —**
- While technological fixes can help, they often serve vested interests, benefiting wealthier citizens with air purifiers, while leaving poorer communities vulnerable.
- The real fight for clean air is political, and quick fixes perpetuate inequalities rather than addressing root causes.
- **Long-Term Commitment —**
- India needs a multi-decadal, multi-sectoral effort grounded in scientific thinking and committed to sustained collaboration to tackle the structural issues behind its air pollution crisis.

**Source** - **The Indian Express**

**QUESTION - India’s air pollution crisis is a multi-faceted problem that exacerbates inequalities and requires a comprehensive, science-based approach. Discuss the limitations of the current measures taken to combat air pollution, with a focus on the role of technology-centric solutions, and suggest sustainable strategies that can address the root causes of pollution in the country.**