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From

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GENERAL STUDIES 2

1.1. POLITY & GOVERNANCE

1.1.1. SUPREME COURT CLARIFIES THE MEANING OF "INDUSTRY" UNDER LABOUR LAW

Context

A **nine-judge Supreme Court Bench** has clarified the meaning of "**industry**" under labour law. It retained the **1978 Bangalore Water Supply "triple test"** for pending cases under the repealed Industrial Disputes Act, while holding that the **Industrial Relations Code, 2020** must be interpreted independently.



Introduction

The meaning of "**industry**" has long been debated in relation to **hospitals, educational institutions, charities and government activities**. The Court retained the **1978 Triple Test** for pending cases while treating the **new Labour Code independently**, balancing **labour rights, judicial precedent and legal certainty**.

What is the "Industry" Debate?

Industrial Disputes Act, 1947

- **Section 2(j):** Defined "industry", creating uncertainty over which institutions and activities came under labour laws.
- **Hospitals:** Whether healthcare institutions could be treated as industries for labour-law protection.
- **Universities:** Whether educational institutions fall within the definition of an industry.
- **Charitable Institutions:** Whether non-profit organisations can qualify as industries despite having no profit motive.
- **Government Departments:** Whether government-run activities constitute an industry or a sovereign function.

Bangalore Water Supply Case, 1978 — Triple Test

- **Systematic Activity:** The activity must be organised and carried out in a structured manner.
- **Employer–Employee Cooperation:** The activity must involve cooperation between employers and employees.
- **Goods/Services:** The activity must produce or provide goods or services to satisfy human needs.

Why is the Latest Judgment Significant?

1. Continuity of Labour Rights

- **Pending cases:** Existing disputes under the old Act will continue under the **1978 Triple Test**.
- **Legal certainty:** Prevents disruption of long-pending labour claims.

2. Clarifies the New Labour Code

- **Independent framework:** The Industrial Relations Code, 2020 has its own definition and exclusions.
- **No automatic application:** The 1978 judgment cannot simply be applied to the new Code.

3. Reinforces Stare Decisis

- **Judicial precedent:** Established judgments of larger Benches should not be overturned casually.
- **Exceptional grounds:** Reconsideration requires grounds such as **manifest error or serious public mischief**.

4. Clarifies Sovereign Functions

- **Not every State activity:** Government activity does not automatically qualify as a sovereign function.
- **Narrow exception:** Only **core and inalienable governmental functions** are generally excluded.

5. Relevant to Changing Work Patterns

- **New employment landscape:** Privatisation, outsourcing, contract work, gig work and platform employment make the definition of “industry” increasingly significant.

Constitutional Dimension

- **Equality & Association: Articles 14 and 19(1)(c)** ensure equality and protect workers’ right to form associations and trade unions.
- **Dignity & Livelihood: Article 21** links labour protection with the right to live with dignity and livelihood.
- **Social & Economic Justice: Articles 38 and 39** seek social justice and protection of livelihood and workers’ interests.
- **Decent Work: Articles 41, 42 and 43** promote the right to work, humane working conditions, living wages and a decent standard of life.

Challenges / Issues Highlighted by the Judgment

1. Expansive vs Narrow Interpretation

- A broad definition strengthens worker protection.
- But excessive expansion can create uncertainty for employers and institutions.
- A narrower definition may provide clarity but risk excluding vulnerable workers.

2. Continuing Ambiguity

- The fractured judgment shows continuing disagreement over the boundary between:
 - Economic activity
 - Welfare activity
 - Sovereign function

3. Changing Nature of Work

- Traditional labour laws were designed around conventional employer–employee relationships.

- Gig work, platform employment, outsourcing and contractual work are creating new regulatory challenges.

4. Judicial Interpretation vs Legislative Policy

- Courts interpret statutory provisions, while Parliament determines the legislative framework.
- The new Labour Code therefore requires interpretation primarily on the basis of its **own text and legislative scheme**.

Way Forward

- **Ensure Clear Legislative Definitions:** Parliament should provide precise definitions in labour laws to reduce ambiguity and **prolonged litigation**.
- **Implement Labour Codes Effectively:** Labour reforms should balance **worker protection, ease of doing business, industrial flexibility and social security**.
- **Adapt Laws to New Forms of Work:** Labour protections must evolve to cover **gig, platform, contract and informal workers** in the changing labour market.
- **Maintain Narrow Sovereign-Function Exemption:** Only **core and inalienable governmental functions** should be excluded, not ordinary welfare or service activities.
- **Balance Competing Interests:** Labour policy should harmonise **worker welfare, economic efficiency, legal certainty and social justice**.

Conclusion

The judgment balances **labour rights with statutory clarity**, while allowing the new Labour Code to evolve independently. India must pursue **economic growth without compromising dignity of labour and social justice**.

Q. The Supreme Court's interpretation of "industry" reflects the need to balance labour protection with legal certainty and changing economic realities. Discuss. 15 Marks

1.1.2. YOUTH VOTE AND ITS ELECTORAL IMPACT

CONTEXT

Recent electoral developments have renewed focus on the **role of youth in Indian democracy**. With several States heading for elections, their potential electoral influence is gaining attention. **Lokniti-CSDS data** shows that youth voting varies across **States, age groups and electoral contexts**, rejecting the idea of a uniform "youth vote".



INTRODUCTION

India's youth form a significant electoral group, influencing **participation, preferences and political change**. However, their voting behaviour varies across **age groups, regions and elections (diverse and dynamic, not a uniform bloc)**.

Youth participation → Diverse preferences → Electoral impact.

SIGNIFICANCE

1. Youth participation strengthens democratic representation
Youth participation enhances **representativeness and inter-generational inclusion** in democracy.
However, turnout varies widely across States, indicating the role of **local socio-political and electoral contexts**.
2. Youth is not a homogeneous electorate
Youth preferences differ across **age groups, regions and socio-economic contexts**.
Thus, youth should be viewed as a **demographic category with diverse political preferences**, rather than a uniform voting bloc.
3. Youth preferences are electorally fluid
Youth preferences can change significantly across successive elections, reflecting **changing aspirations, issues and contextual factors**.
This indicates that the youth electorate is **dynamic rather than permanently aligned** with any particular political tendency.
4. Youth preferences may diverge from electoral outcomes
Young voters may favour an electoral alternative that does not ultimately form the government.
Hence, **youth preference and final electoral outcome are distinct variables**.
5. Youth can contribute to electoral change
When high youth participation combines with a concentrated preference, it can significantly influence electoral outcomes.
Thus, youth participation can function as a **catalyst for electoral change**, particularly in closely contested elections.
6. Youth can encourage political alternatives
Young voters may show greater openness towards **emerging political alternatives and new forms of political participation**.
This reflects **generational differences in political attitudes and expectations**.
7. Youth voting reflects changing aspirations
Youth electoral behaviour can reflect aspirations related to **education, employment, economic mobility, governance and representation**.
Therefore, youth preferences provide an important indicator of **changing societal aspirations and policy priorities**

CHALLENGES

1. Low and uneven youth participation
Youth turnout varies considerably across regions, indicating **uneven electoral engagement** among young citizens.
Differences in social, economic and institutional contexts influence their participation.
2. Overgeneralisation of the "youth vote"
Treating youth as a homogeneous category overlooks differences in **age, region, education, socio-economic status and location**.

Such generalisation can lead to inaccurate assessments of youth electoral behaviour.

3. Gap between political interest and participation

Young people may show considerable interest in public affairs without translating it into **formal electoral participation**.

This creates a gap between **political awareness and institutional engagement**.

4. Vulnerability to misinformation

Greater reliance on digital platforms can increase exposure to **misinformation, disinformation and algorithmic echo chambers**.

This may undermine informed decision-making and the quality of democratic deliberation.

5. Limited institutional representation

Despite their demographic significance, young people remain relatively underrepresented in **formal decision-making institutions**.

This can create a gap between **youth aspirations and institutional representation**.

6. Issue–representation gap

Youth aspirations increasingly centre on **employment, education, skills, mobility and economic opportunities**.

However, these concerns may not always translate into sustained **policy engagement and institutional outcomes**.

7. Participation does not ensure empowerment

High electoral turnout alone does not guarantee meaningful democratic participation or representation.

Effective empowerment requires **Participation + Informed Choice + Representation + Accountability**.

WAY FORWARD

1. Strengthen youth voter participation

Expand targeted **voter-awareness and registration programmes** for first-time voters and underrepresented youth.

Focus on improving accessibility, awareness and participation across diverse social groups.

2. Promote informed participation

Strengthen **media and digital literacy** to help young citizens critically assess information and identify misinformation.

This can promote **evidence-based decision-making and informed civic participation**.

3. Use age-disaggregated electoral data

Analyse youth participation across distinct age groups such as **18–21, 22–25 and 26–28 years**. This enables a more nuanced understanding of **generational differences in electoral behaviour**.

4. Increase youth representation

Create greater opportunities for youth participation in **local governance, public consultations and policymaking processes**.

This can bridge the gap between **demographic significance and institutional representation**.

5. Address substantive youth concerns

Strengthen policies relating to **education, employment, skills, entrepreneurship and social mobility**.

Responsive governance can convert youth aspirations into **constructive civic and developmental participation**.

6. Strengthen democratic institutions

Ensure **transparent electoral processes, accountable governance and accessible grievance-redressal mechanisms**.

Strong institutions can enhance **institutional trust and sustained civic participation** among young citizens.

7. Shift from voters to stakeholders

Move beyond election-time mobilisation towards **continuous youth engagement in democratic governance**.

This requires creating institutional spaces for young citizens to **participate, deliberate and contribute to policymaking**.

CONCLUSION

The significance of youth lies not merely in their **numbers**, but in their participation and ability to shape democratic outcomes. India must therefore view youth as **informed stakeholders in democratic governance**, rather than merely an electoral constituency.

Q. The youth electorate in India is diverse and dynamic rather than a homogeneous political bloc. Discuss its significance for electoral participation and democratic outcomes. 15 Marks

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2.1. ECONOMY

2.1.1. BALANCING INFRASTRUCTURE DEVELOPMENT & ENVIRONMENTAL SUSTAINABILITY

Context

Tamil Nadu's decision on August 24, 2026 to scrap the proposed **Parandur greenfield airport** has reopened the debate on **infrastructure-led growth versus agricultural livelihoods, environmental sustainability, land acquisition, federal clearances and long-term urban planning.**



Introduction

The Parandur episode highlights the difficulty of developing large infrastructure in densely populated and environmentally sensitive regions. It raises a fundamental governance question on **how India pursuing rapid infrastructure expansion without compromising livelihoods, ecological security and its social legitimacy.**

What was the Parandur Airport project?

- **Parandur was proposed as a greenfield international airport** to serve Chennai's rapidly growing passenger, cargo and industrial requirements and to eventually function alongside the existing Chennai International Airport at Meenambakkam.
- The project emerged from **Tamil Nadu's long-standing search for a second airport**, with earlier proposals including Sriperumbudur and other locations before Parandur was selected in 2022.
- The proposed project was envisaged as a **large-scale, multi-phase aviation infrastructure project**, with substantial supporting road, Metro, logistics and commercial infrastructure.
- The project had received **site clearance and in-principle approval-related clearances**, and the Union Ministry of Civil Aviation formally granted in-principle approval subject to compliance with conditions and other statutory clearances.

Reasons behind the need for such an airport

1. Rising passenger and cargo traffic

- **Chennai is a major aviation and economic hub in South India**, and the existing airport at Meenambakkam is facing increasing pressure from rising passenger and cargo traffic.
- The projected growth in aviation demand necessitated **additional long-term airport capacity**, as continuous expansion of an existing airport within a densely urbanised region has inherent spatial and operational limitations.

2. Supporting Tamil Nadu's industrial and manufacturing ecosystem

- Chennai and its surrounding industrial corridors have a strong presence in **automobiles, electronics, engineering, IT and manufacturing**, generating substantial demand for efficient domestic and international connectivity.

- A modern international airport could facilitate the movement of **high-value cargo, business travellers, skilled professionals and time-sensitive goods**, thereby strengthening Tamil Nadu's position in global value chains.

3. Strengthening global connectivity

- Additional airport capacity could enable Chennai to expand its **international air connectivity** and strengthen its position as a global business and investment destination.
- Improved aviation connectivity is particularly important for attracting **FDI, multinational enterprises, tourism and high-value services**, thereby contributing to India's broader objective of becoming a globally competitive manufacturing and services economy.

4. Promoting regional and polycentric development

- A second airport could promote **polycentric urban development** by distributing economic activity beyond the existing metropolitan core.
- Airport-led development could generate supporting infrastructure such as **highways, Metro/rail connectivity, logistics parks, commercial centres and industrial clusters**, creating new regional growth centres.

Reasons and factors behind scrappage of the project

1. Large-scale land acquisition

- The proposed airport required approximately **5,846 acres of land**, including substantial private agricultural land, creating concerns regarding **displacement, loss of farmland and livelihood insecurity**.
- The State government indicated that around **3,774 acres constituted private patta land**, including approximately **2,681 acres of fertile agricultural land**, making the project particularly sensitive from a livelihood perspective.

2. Impact on farmers and rural livelihoods

- Farmers opposed the project because agricultural land was not viewed merely as a financial asset but as a source of **livelihood, social identity, inter-generational wealth and community security**.
- One-time monetary compensation cannot always adequately compensate for the loss of **land-based livelihoods and established rural socio-economic networks**.

3. Water bodies and ecological concerns

- The proposed site contained **water bodies, canals and natural drainage systems**, raising concerns regarding alteration of the area's natural hydrology.
- Large-scale construction could potentially interfere with **water storage, drainage and groundwater systems**, increasing the risk of waterlogging and flooding.

4. Environmental clearance concerns

- Despite considerable progress in land acquisition and project planning, the project had not secured all necessary statutory approvals, particularly **environmental clearance**, according to the State government's position.
- The episode demonstrates that **land acquisition and administrative approvals should not precede comprehensive environmental and social feasibility assessments**.

- It also highlights the importance of integrating **Environmental Impact Assessment (EIA), hydrological assessment and disaster-risk assessment** at the initial planning stage.

5. Persistent public resistance

- Villagers, particularly in and around **Ekanapuram**, had sustained opposition to the project over several years.
- Prolonged protests demonstrated that **social legitimacy is an important component of infrastructure feasibility**, alongside financial and technical feasibility.

6. Land acquisition had progressed substantially but the project remained contested

- The project had moved beyond the conceptual stage, with the State government stating that around **1,802 acres, or approximately 48% of the required land, had already been acquired**.
- However, the continuation of social and environmental concerns despite substantial land acquisition demonstrates the limitations of treating **land availability alone as an indicator of project readiness**.

7. Development versus environmental sustainability

- The Parandur controversy represents a classic **development–environment dilemma**, where infrastructure intended to generate economic growth can simultaneously impose ecological and social costs.
- It demonstrates the need to incorporate **ecological carrying capacity, climate risks, hydrological systems and livelihood concerns** into infrastructure planning rather than treating them as secondary considerations.

Implications due to the scrapping decision

A. Positive implications

1. Protection of agricultural livelihoods

- Scrapping the project prevents further acquisition of agricultural land and reduces the possibility of **large-scale displacement and disruption of rural livelihoods**.
- It provides greater security to farmers whose livelihoods and socio-economic networks were closely associated with their land.

2. Environmental and ecological protection

- Avoiding construction over a landscape containing **water bodies and natural drainage systems** can reduce potential ecological and hydrological disruption.
- It provides an opportunity to prioritise **climate-resilient and environmentally sensitive infrastructure planning** while selecting an alternative site.

3. Reduction in social conflict

- Cancellation can address prolonged opposition from affected villages and reduce the possibility of continuing **protests, litigation and administrative conflict**.
- It reinforces the importance of **public participation and social consent** in large infrastructure projects.

4. Greater emphasis on sustainable infrastructure

- The decision can encourage policymakers to adopt a broader definition of infrastructure feasibility that includes **environmental sustainability, social impact and disaster resilience** along with economic returns.

B. Negative implications and challenges

1. Chennai's long-term aviation capacity gap remains unresolved

- Scrapping Parandur does not eliminate Chennai's growing requirement for additional aviation capacity.
- The government must therefore identify an **alternative site** that can meet future passenger and cargo demand without reproducing the problems associated with Parandur.

2. Delay in infrastructure expansion

- The cancellation may postpone the creation of additional airport capacity and potentially constrain Chennai's ability to accommodate **future industrial, logistics, tourism and international business growth**.
- A prolonged search for an alternative site could result in **capacity bottlenecks and higher future infrastructure costs**.

3. Sunk costs and resource wastage

- Considerable resources had already been committed towards **land acquisition, planning, surveys, compensation and project preparation**.
- Scrapping the project creates the possibility that some of these expenditures may become **sunk costs**, raising questions about the efficiency of infrastructure planning.

4. Policy and investment uncertainty

- Repeated changes in major infrastructure projects can create perceptions of **policy uncertainty and project risk** among investors.
- Since airports require substantial capital and have long gestation periods, maintaining **credible and predictable infrastructure policies** is important for attracting private investment.

Way Forward

1. Adopt scientific multi-criteria site selection

- The alternative site should be selected through a transparent framework assessing **aviation feasibility, land availability, ecological sensitivity, hydrology, flood risk, population displacement, connectivity and financial viability**.

2. Follow "environmental assessment before acquisition"

- Comprehensive **EIA, Social Impact Assessment (SIA), hydrological studies and disaster-risk assessments** should precede large-scale land acquisition.
- This can prevent a situation where substantial resources are committed before fundamental environmental and social concerns are resolved.

3. Adopt participatory land acquisition

- Local communities should be involved through **Gram Sabhas, public consultations and transparent disclosure of project impacts**.

- Compensation should be supplemented with **livelihood restoration, rehabilitation, skill development and long-term income-support mechanisms**.

4. Protect agricultural and ecological assets

- Productive agricultural land, wetlands, lakes and natural drainage channels should receive greater weight during site selection.
- The principle of **“avoid, minimise and compensate”** should guide infrastructure development in environmentally sensitive areas.

5. Strengthen interim capacity

- Existing airport capacity should be optimised through **terminal expansion, improved passenger-processing technology, operational efficiency and better multimodal connectivity**.

Conclusion

The way forward is neither indiscriminate infrastructure expansion nor blanket opposition to development. **India needs participatory, environmentally sensitive and economically viable infrastructure planning that converts development from a source of displacement into an instrument of inclusive and sustainable growth.**

Q. The scrapping of the proposed Parandur Greenfield Airport highlights the complex trade-off between infrastructure-led growth, environmental sustainability and livelihood security. Discuss the major issues involved and suggest a sustainable way forward. 10 marks

2.1.2. BEYOND BARRELS: INDIA'S BLUEPRINT FOR A \$42 BILLION STRATEGIC ENERGY SHIELD

Context

West Asia-related disruptions have exposed critical vulnerabilities in India's energy-security system. While India imports vast quantities of fossil fuels, its capacity to store and release these fuels during prolonged geopolitical supply shocks remains severely constrained.



Introduction

To buffer the economy against volatile supply disruptions, the Indian government is evaluating a \$42 billion, decade-long strategic fuel program. This initiative aims to transition India from managing short-term market fluctuations to building a robust, multimodal energy-defense architecture across crude oil, natural gas, and LPG.

About Strategic Petroleum Reserves (SPRs)

- **Definition:** SPRs are dedicated, large-scale emergency stockpiles of crude oil maintained by sovereign nations.
- **Purpose:** They serve exclusively as a strategic buffer against sudden supply chain disruptions and price shocks, operating entirely independently of routine commercial inventories.

Historical Background

- **Origin:** The concept of sovereign SPRs emerged globally following the 1973 Oil Crisis, triggered by an Arab oil embargo.
- **Global Standard:** Since then, major oil-importing economies like the US, China, and Japan have maintained massive reserves to stabilize domestic markets during crises.

India's Oil Stockpiles: Current Status

- **Market Position:** India is the world's third-largest consumer of crude oil, with an import dependency exceeding 88%.
- **Inherent Vulnerability:** This heavy reliance leaves the macroeconomic framework highly exposed to external supply chokepoints.
- **The Gas/LPG Deficit:** Beyond crude, India currently operates **zero** underground natural gas storage facilities and a minimal 0.14 MT of LPG capacity, relying almost entirely on real-time maritime logistics.

The IEA Benchmark Comparison

- **The Mandate:** The International Energy Agency (IEA) recommends member nations maintain oil stocks equivalent to **90 days** of net imports.
- **India's Reality:** As an Associate Member, India's total national storage—combining strategic reserves and commercial refinery stocks—currently stands at just **74 days**.

India's Existing SPR Infrastructure

- **Management:** Monitored by the Indian Strategic Petroleum Reserve Limited (ISPRL).
- **Phase I Footprint:** Comprises three underground rock caverns totaling 5.33 million tonnes (MT) at Visakhapatnam, Mangaluru, and Padur.
- **Utilization Gap:** Operating at only ~64% capacity (holding ~3.37 MT), Phase I provides a thin buffer covering roughly **9.5 days** of India's crude needs.

Planned Expansion: Future SPR Sites

- **Approved Expansion:** Phase II targets a 6.5 MT addition via reserves at Chandikhol (4 MT) and a Padur expansion (2.5 MT).
- **Proposed Additions:** Pending proposals for Bikaner and Rajkot aim to add another 6 MT.
- **Long-Term Vision:** The overarching masterplan targets an additional 28 MT of crude (two months cover), 9 MT of LNG (56 days cover), and 4 MT of LPG (six weeks cover).

Significance of the Fuel Plan

1. **Macroeconomic Stability:** Absorbs imported inflation shocks, protecting the national fiscal deficit and preventing sudden retail price hikes.
2. **Securing the Energy Transition:** Constructing 9 MT of LNG storage ensures a steady supply of natural gas, a critical "bridge fuel" for India's transition to renewable energy.
3. **Strategic Autonomy:** Empowers New Delhi to maintain an independent foreign policy without coercion from energy cartels during international conflicts.
4. **Upgraded Sectoral Resilience:** Expanding LPG and gas buffers shields domestic cooking gas supplies and priority industrial sectors (e.g., fertilizers) from supply chokepoints.

5. **Supply Chain Sovereignty:** Synergizes with domestic maritime capacity building, directly reducing India's historical reliance on foreign-owned shipping fleets.

Associated Challenges

1. **Astronomical Capital Drain:** Funding the estimated \$42 billion for infrastructure (CAPEX) without levying a direct public cess poses a severe fiscal challenge.
2. **Implementation Paralysis:** Approved Phase II projects remain stalled by complex land acquisition hurdles and friction in Public-Private Partnership (PPP) finalizations.
3. **Inventory Price Traps:** Replenishing emergency stocks post-crisis may force the government to procure fuel at highly inflated global commodity and freight rates.
4. **Geological Complexity:** Constructing underground LNG/gas storage requires specialized engineering for identifying depleted reservoirs or constructing solution-mined salt caverns.
5. **Infrastructure Synchronization:** Storage is ineffective unless cavern extraction rates are perfectly synchronized with inland regasification units, bottling plants, and downstream pipeline grids.

Strategic Way Forward

1. **Scale Hybrid Funding Models:** Aggressively replicate the commercial-cum-strategic foreign leasing model to subsidize public infrastructure costs and offset capital expenditure.
2. **Fast-Track Statutory Approvals:** Expedite land clearances and administrative finalizations for the pending Bikaner and Rajkot sites to rapidly close the gap toward the 90-day IEA benchmark.
3. **Accelerate Subsurface Exploration:** Initiate immediate geological mapping of sedimentary basins (Krishna-Godavari, Cambay) to identify viable depleted reservoirs for natural gas injection.
4. **Establish Clear Governance Protocols:** Formulate a statutory policy clearly defining trigger mechanisms for emergency stock releases and the allocation of replenishment risks.
5. **Synchronize Inland Grid Expansion:** Ensure the recent authorization of 1,800 km of new LPG pipelines is completed concurrently with storage construction to guarantee inland deliverability.
6. **Diversify Import Origins:** Actively reduce Middle East dependence by finalizing supply contracts with North American and African suppliers while acquiring sovereign Very Large Gas Carriers (VLGCs).

Conclusion

True energy security transcends the mere excavation of physical storage space. India must seamlessly synchronize its expanded underground reserves with sovereign maritime shipping assets, robust inland pipeline grids, and a commercially viable governance framework. Securing strategic autonomy in the 21st century relies entirely on executing this integrated infrastructure ecosystem before the next global supply crisis materializes.

Q. Examine the need for expanding India's strategic reserves into a multi-fuel architecture. What are the key infrastructural and fiscal bottlenecks in its implementation? 10 Marks

2.2. ENVIRONMENT

2.2.1. RECONCILING ELEPHANT CORRIDORS WITH INCLUSIVE INFRASTRUCTURE DEVELOPMENT

Context

- The **Supreme Court of India** has directed the Union government to conduct a fresh survey of **elephant corridors**, emphasizing that these pathways cannot be obstructed due to crop damage fears.
- The directive specifically prohibits **coercive measures**, such as fireballs and spikes, aimed at diverting the natural migratory routes of highly mobile **Asian elephants**.



Introduction

- Elephant corridors** are critical linear pathways connecting fragmented habitats, essential for the genetic diversity and seasonal movement of India's **heritage animal**.
- As natural habitats shrink due to **linear infrastructure** and **mining**, preserving these corridors under **Article 51 A(g)** is vital to balancing ecological health with national development and reducing **human-elephant conflict**.

About the Asian Elephant

1. Ecological Profile

- They are the largest terrestrial mammals and act as crucial **keystone species** within their ecosystems.
- They live in highly social, **matriarchal** (female-led) groups, possessing a lifespan of 60-70 years in the wild.
- Their reproductive cycle is slow, with a gestation period of 18 to 22 months and a nursing period lasting 2 to 4 years.

2. Population and Range

- There are three subspecies of the Asian elephant: **Indian, Sumatran, and Sri Lankan**, with the Indian subspecies having the widest range.
- India is home to **60% of the global Asian elephant population**, with the highest numbers found in **Karnataka (25%)**, followed by Assam, Kerala, and Tamil Nadu.

3. Conservation Status

- Recognized for its immense ecological sensitivity, India has declared the elephant as its **National Heritage Animal**.
- They receive the highest level of legal protection: **IUCN (Endangered)**, **CITES (Appendix I)**, and **Wildlife (Protection) Act, 1972 (Schedule I)**.

Understanding Elephant Corridors and Migration Dynamics

1. Ecological Drivers of Migration

- Asian elephants** are highly mobile keystone species requiring extensive home ranges of 50 to 300 square kilometres.

- Movements are heavily influenced by the seasonal distribution of **resources**, as well as historical factors like **climate change** and **drought**.

2. Demographic and Habitat Shifts

- While the **Western Ghats** holds over 50% of the population, its habitat is rapidly fragmenting due to **invasive plants** and **commercial plantations**.
- The **Central India** landscape has witnessed increased herd movement from Jharkhand and Odisha into neighbouring states primarily due to severe **iron ore mining** pressures.

3. Legal and Administrative Status

- The **Madras High Court** and **Supreme Court** have upheld the **Right of Passage** for animals under **Project Elephant** and **Article 51 A(g)** of the Constitution.
- However, **Elephant Reserves** and corridors currently lack strict statutory protection under the **Wildlife (Protection) Act, 1972**, making them vulnerable to industrial diversion.

Significance of Elephant Corridors

1. Ensures Genetic Viability

- Corridors facilitate crucial **natural dispersal**, allowing elephant populations to intermingle across different landscapes.
- This prevents inbreeding and maintains robust, disease-resistant **genetic diversity** outside localized gene pools.

2. Mitigates Human-Animal Conflict

- Dedicated pathways prevent herds from inadvertently straying into **agricultural farmlands** and human settlements.
- By ensuring safe transit, well-conserved corridors significantly reduce fatal encounters and crop depredation incidents.

3. Guarantees Resource Accessibility

- They allow unhindered access to vital seasonal **food and water** sources, particularly during dry months in moist forests.
- This prevents starvation and resource-induced stress among the highly social, **matriarchal herds**.

4. Protects Broader Ecosystems

- As **keystone species**, protecting elephant transit routes inadvertently conserves massive tracts of contiguous forests.
- This umbrella protection maintains overall **ecosystem health**, protects diverse flora, and combats systemic poaching activities.

5. Fulfils Constitutional Obligations

- Protecting corridors operationalizes **Article 51 A(g)**, mandating compassion for living creatures and the protection of wildlife.
- It reinforces India's commitment to conserving the **Asian Elephant**, legally recognized as the national heritage animal.

Challenges in Preserving Elephant Corridors

1. Unchecked Linear Infrastructure

- The expansion of **highways, railway lines**, and **canals** directly bisects traditional migratory routes across India.
- Projects like the Bengaluru-Chennai railway line create severe physical bottlenecks, pushing elephants into conflict zones.

2. Industrial and Mining Pressures

- Aggressive **iron ore mining**, oil drilling, and hydel projects devastate habitats, particularly in the Central and Eastern Ghats.
- These activities displace herds, forcing them to migrate into unfamiliar, human-dominated territories like Chhattisgarh and Madhya Pradesh.

3. Land-Use Alterations

- The rapid conversion of forest peripheries into **tea/coffee estates**, resorts, and ashrams continuously narrows available movement space.
- Agricultural expansion and the erection of **electric fences** aggressively block traditional, ground-validated paths.

4. Coercive Human Interventions

- Local communities often resort to illegal and violent deterrents such as **fireballs** and **spikes** to protect crops.
- These measures cause extreme animal distress and unpredictably alter their natural migratory behaviours, increasing the risk of retaliation.

5. Lack of Statutory Recognition

- **Elephant reserves** and corridors are merely administrative classifications, lacking strict recognition under the **Wildlife (Protection) Act, 1972**.
- This legal loophole permits governments to readily divert these critical habitats for destructive developmental projects.

Way Forward

1. Accord Statutory Legal Protection

- Corridors and reserves must be formally recognized as protected areas under the **Wildlife (Protection) Act, 1972** to restrict harmful activities.
- Statutory backing will prevent the easy administrative diversion of these habitats for mining or large-scale infrastructure projects.

2. Enforce Strict Judicial Mandates

- State forest departments must strictly enforce the **Supreme Court's** ban on all coercive diversion tactics like fireballs and spikes.
- Violators obstructing the constitutionally guaranteed **Right of Passage** must face swift and stringent legal penalties.

3. Implement Eco-Friendly Infrastructure

- Mandate the integration of **animal underpasses**, overpasses, and eco-bridges in all linear infrastructure projects bisecting forests.

- Structural mitigation will ensure seamless developmental growth without severing vital ecological linkages.

4. Dynamic and Continuous Mapping

- Regularly update the 2023 **corridor mapping** inventory using advanced GIS and remote sensing technologies.
- Adaptive mapping will help authorities track shifting migration routes influenced by **climate change** and resource scarcity.

5. Regulate Land-Use and Zoning

- Enforce stringent **zoning laws** to formally prohibit commercial plantations, resorts, and mining near recognized bottlenecks.
- Clear buffer zones must be established to prevent human encroachment into validated migratory pathways.

6. Empower Community-Led Mitigation

- Develop prompt **crop-insurance** mechanisms to financially compensate farmers, reducing retaliatory violence against elephants.
- Involve local populations in tech-based **early-warning systems** to peacefully manage and anticipate herd movements.

Conclusion

Elephant corridors are ecological imperatives, not merely administrative boundaries. Reconciling infrastructure growth with the **Right of Passage** requires granting these pathways strict statutory immunity under environmental laws. By enforcing judicial mandates and fostering community participation, India can ensure the peaceful coexistence and long-term survival of its national heritage animal.

Q. "Discuss the ecological significance of elephant corridors in mitigating human-wildlife conflict. Examine the key challenges in preserving these habitats and suggest a way forward in light of recent Supreme Court directives."

2.3. DISASTER MANAGEMENT

2.3.1. RETHINKING URBAN RESILIENCE IN THE ERA OF CLIMATE CHANGE

Context

Recent extreme weather events in **Gurugram** severe heatwaves followed by paralyzing floods highlight a profound governance deficit. These dual crises expose how **meteorological hazards** swiftly transform into **anthropogenic urban disasters** when compounded by unregulated concretisation, compromised drainage networks, and a lack of climate-responsive spatial planning.



Introduction

Rapid urbanization and climate change have transformed Indian cities into epicenters of compounding crises. As defined by the UNDRR, a **hazard becomes a disaster** only when it intersects with **systemic societal vulnerabilities**. With India's urban population projected to reach **951 million by 2050**, shifting urban governance from **reactive relief to proactive climate resilience** is imperative to protect vulnerable demographics and sustain economic growth.

What is Urban Disaster Risk?

- It is the outcome of a **natural hazard** (like a heatwave, cloudburst, or cyclone) striking a location where people, buildings, and public services are **highly exposed** and lack the capacity to withstand it.
- In cities, risks are exacerbated by **hydrological choke points** (narrowed natural drains, encroached wetlands) and the **Urban Heat Island (UHI) effect** (dense construction trapping heat).

Legislative Basis

- The **Disaster Management (Amendment) Act, 2025** inserted **Section 41A**, mandating the creation of **Urban Disaster Management Authorities (UDMAs)** in state capitals and major municipal corporations.
- The **2026-31 Finance Commission** included **heatwaves and lightning** as notified natural calamities, allowing states to unlock specific **disaster response and mitigation funds**.

Significance of Building Urban Resilience

1. Future-Proofing Urban Infrastructure

- Over **half of the infrastructure** Indian cities will need by 2050 is yet to be built.
- Integrating climate risk assessments now prevents the locking-in of structural vulnerabilities and averts future catastrophic losses.

2. Financial Prudence and Loss Prevention

- Proactive adaptation is highly lucrative; timely interventions could prevent **\$5 billion in annual flood losses by 2030** and save over **130,000 lives from extreme heat by 2050**.
- It protects against the invisible economic toll, such as **lost wages for informal workers** and the disruption of MSMEs.

3. Empowering Decentralised Governance

- The establishment of UDMAs marks a paradigm shift from ad-hoc, district-level responses to **institutionalized, city-specific disaster management**.
- It empowers local municipal commissioners to lead tailored, localized mitigation strategies.

4. Mitigating the Urban Heat Island (UHI) Effect

- Proper planning ensures neighbourhoods do not absorb and retain dangerous levels of heat, which currently makes city centres **3-4°C hotter** than surrounding areas.
- It directly shields **outdoor workers** and residents of poorly ventilated slums from fatal heat exposure.

5. Data-Driven Policy Formulation

- The legislative mandate for a **national database** containing real-time risk assessments ensures that urban master planning is backed by scientific, localized data.
- This facilitates the creation of actionable **flood and heat hazard maps** to guide urban expansion.

Challenges Associated with Urban Climate Resilience

1. Implementation Lethargy and Ambiguity

- The 2025 amendment lacks strict deadlines for UDMA formation. By early 2026, **Karnataka was the only state** to have notified an authority for Bengaluru.
- This leaves major metropolitan centers structurally blind and unprepared for impending crises.

2. Severe Capacity and Planning Deficit

- A NITI Aayog report highlighted that **65% of India's urban settlements lack a master plan**.
- State planning departments suffer from massive vacancies, having fewer than **4,000 town planners** against an estimated requirement of 12,000.

3. Institutional Fragmentation

- Urban governance remains siloed, with responsibilities haphazardly split between **municipal corporations, district administrations, and state departments**.
- This overlapping jurisdiction leads to a lack of accountability and poor coordination during emergencies.

4. Poor Enforcement of Master Plans

- Climate action plans and zoning regulations exist largely as **advisory documents**.
- They routinely fail to halt lucrative real estate and road projects that **encroach upon critical floodplains, lakes, and open spaces**.

5. Reactive Financing Models

- Despite recent amendments, financial mechanisms heavily favor **post-disaster relief** rather than mitigation.
- There is a lack of structural frameworks linking **municipal infrastructure grants** directly to climate-resilient land-use compliance.

Global Best Practices

1. China – Sponge City Initiative

- Focuses on managing urban flood risks by using **permeable surfaces, green roofs, and constructed wetlands** to absorb and reuse 70% of rainwater.
- Shifts urban infrastructure from "grey" (concrete) to **"blue-green"** (natural), heavily reducing the burden on artificial drainage.

2. Netherlands – Room for the River Programme

- Instead of building higher dams, the framework restores **natural floodplains** to give rivers more space to manage high water levels.
- Integrates spatial planning with water management to ensure **long-term ecological and infrastructural safety**.

Way Forward

1. Statutory Integration of Risk Mapping

- **Micro-level flood and heat hazard maps** must be legally embedded into city master plans.
- These maps should dictate strict "**no-build**" **zones**, building plinth levels, and mandatory ventilation standards.

2. Deadline-Driven Institutionalization of UDMAs

- The Union Government must enforce **strict timelines** for States to operationalize UDMAs.
- These authorities must be equipped with dedicated budgets and the power to **coordinate diverse municipal and emergency services**.

3. Aggressive Capacity Building

- Urgently bridge the human resource deficit by recruiting **qualified urban planners, hydrologists, and climate scientists** into local governance.
- Technical experts are needed to ensure development decisions account for hazard exposure and resilience measures.

4. Conditional Financial Devolution

- Link **infrastructure grants and municipal funding** directly to a city's compliance with land-use rules, drainage maintenance, and green-cover preservation.
- Financing must structurally extend beyond post-disaster relief.

5. Invest in Blue-Green Infrastructure (BGI)

- Mandate nature-based engineering solutions, such as **permeable pavements, wetland restoration, and expansive urban tree canopies**.
- This naturally mitigates both the Urban Heat Island effect and localized flooding.

6. Actionable Early Warning Systems (EWS)

- Move beyond passive weather alerts by instituting **standardized, pre-agreed action protocols**.
- Warnings should automatically trigger **mandatory outdoor work halts, hospital readiness, and school closures** based on specific weather thresholds.

Conclusion

While extreme weather events are inevitable byproducts of climate change, **urban disasters are the result of human planning failures**. As India stands on the cusp of an unprecedented urban transition, integrating statutory climate resilience into daily governance is non-negotiable to ensure our cities remain safe, sustainable engines of economic growth.

Q. Flooding in urban areas is an emerging climate-induced disaster. Discuss the causes of this disaster. Mention the features of two such major floods in the last two decades in India. Describe the policies and frameworks in India that aim at tackling such floods.

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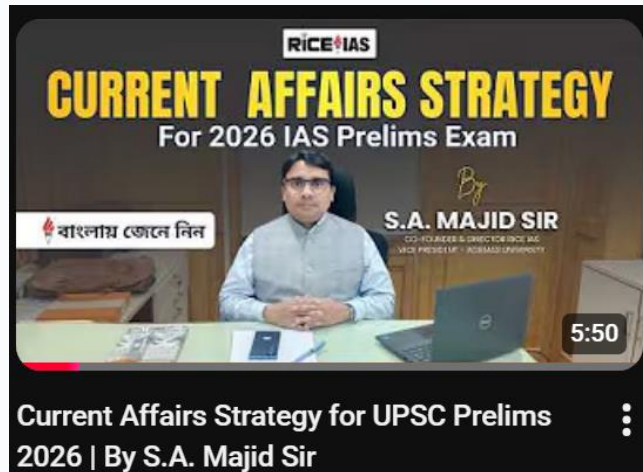
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