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The fading of India's environmental jurisprudence

Prelims: General Studies Paper - 1
Indian Polity and Governance - Constitution, Political System, Panchayati Raj, Public Policy, Rights Issues

Mains: General Studies - 2
Government policies and interventions for development in various sectors and issues arising out of their design and implementation

Mains: General Studies - 3
Conservation, environmental pollution and degradation, environmental impact assessment

1. Background

- India's environmental jurisprudence is at **a constitutional crossroads**, where **development is increasingly prioritised over ecological protection**.
- Recent policy shifts and judicial reversals indicate dilution of the **precautionary principle**, risking long-term ecological and constitutional damage.

2. Judicial Dilution of Environmental Protection

- **18 December 2025**: For non-coal mining, **land acquisition precedes Environmental Impact Assessment (EIA)**; EIA permitted without clear location or area details.
- **Vanashakti vs Union of India (2025)**: The **Supreme Court of India** recalled its ban on **retrospective environmental clearances**, weakening enforcement..
- Although the Chief Justice of India later **stayed a controversial order suo motu,** the **dilution of environmental jurisprudence had already begun.**
- This reflects a **paradigm shift**, where the environment is treated as **negotiable rather than foundational** to development.

3. Pattern of Ecological Retreat

Aravalli Hills:

- Earlier rulings (**M.C. Mehta vs Union of India, 2004**-orders till 2010)) **banned mining** in the Aravallis
- They rejected the **100-metre height rule**, recognising the Aravallis as a **continuous ecological system**
- The **2025 ruling** accepted the 100-metre definition, **excluding large ecologically important areas**.
- This creates **arbitrary classification**, violating **Article 14** and diluting **Articles 21 and 48A**.

Article 48A

- Article 48A was inserted by the **Constitution (Forty-Second Amendment) Act, 1976**.
- It directs the State to **protect and improve the environment** and to safeguard forests and wildlife.
- As a **Directive Principle of State Policy**, it is **non-justiciable** but provides constitutional guidance for environmental legislation and governance.

Mangroves:

- Courts permitted destruction of **158 mangroves** for **Adani Cementation Ltd. (Raigarh, 2025)** and felling/ transplanting of around 34,000 mangrove trees in Mumbai.
- Dependence on **compensatory afforestation** ignores ecological science, as **mature mangrove ecosystems cannot be replaced quickly** or elsewhere.

Char Dham Highway (Uttarakhand):

- June 2025 study identified **811 landslide-prone zones** along the project.
- Despite recognising ecological fragility (**Citizens for Green Doon vs Union of India, 2021**), **wider roads were permitted** citing defence needs.
- Subsequent floods and disturbances **question the sustainability of this "balancing" approach.**

4. Constitutional and Governance Concerns

- Courts and regulators increasingly **rely on mitigation promise**s, not strict legal compliance.
- The principle in **Common Cause vs Union of India (2017)** against **post-facto environmental clearances** has been weakened by later leniency.
- **Capital-intensive projects face fewer barriers**, as public hearings are curtailed and objections dismissed, undermining Article 14.
- **Preferential treatment to powerful actors** erodes the **public trust doctrine** (M.C. Mehta vs Kamal Nath, 1996) and constitutional equality.

Public Trust Doctrine

- The Public Trust Doctrine holds that **natural resources** like air, water, sea, and forests are **meant for public use** and **should not be privately owned.**
- It places a **duty on the State to protect these resources** for public benefit, not private or commercial exploitation.

5. Way Forward.

- Courts must reclaim their role as **guardians of ecological rights:**
  - Regular sittings of the **Supreme Court Green Bench.**
  - Similar specialised benches in all High Courts.
- **Ease of doing business** must not translate into **ease of environmental destruction**

More money for defence, now fix the process

Prelims: General Studies Paper - 1
Economic and Social Development-Sustainable Development, Poverty, Inclusion, Demographics, Social Sector Initiatives, etc.

Mains: General Studies - 3
Government Budgeting.

1. Defence Budget Increase and Priorities

- The defence budget increased by **about 15%, reaching roughly 2% of GDP.**
- Capital expenditure (modernisation and equipment) has **increased by over 22%, surpassing revenue expenditure.**
- The **Indian Air Force received a 32% increase in funding,** while the Indian Army got a **30% rise for heavy vehicles and weapons.**
- The **Indian Navy received only a 3% increase**, despite its major responsibilities in the Indian Ocean.
- This smaller increase is likely because of the **Navy's success in indigenisation and its ability to efficiently use allocated funds.**
- The government is emphasizing **modernisation and strategic preparedness.**

2. Financial Constraints and Structural Issues

- The **weakening rupee** has made **defence imports more expensive**.
- Defence exports have grown significantly (from **₹1,000 crore in 2014 to ₹23,000 crore recently).**
- **Pension expenditure remains high,** taking a substantial share of the Ministry of Defence allocation.
- There is a proposal to create a **Non-Lapsable Defence Modernisation Fund** so that unused capital funds are not returned at the end of the financial year.

3. Bureaucratic and Procurement Challenges

- **75% of capital procurement funds** are **reserved for domestic industry**, including private sector firms.
- The **L-1 (lowest-cost) procurement rule often discourages innovation** and makes it difficult for smaller technology firms to compete.
- **Major projects face long delays**, such as:
  - Project-75 submarines
  - Rafale fighter aircraft acquisition
- These delays reflect **bureaucratic inefficiencies and weak long-term planning.**

4. R&D, Economic Linkages, and Strategic Vision

- **India spends only 0.66% of GDP on research**, compared to countries like Japan (3.7%).

- There is **limited private-sector participation in R&D.**
- Defence spending should be viewed as **supporting economic growth, not just as a choice between military spending and welfare spending.**
- Examples of economic benefits:
  - **Border Roads Organisation (BRO) supporting border development** and connectivity
  - **Indigenous shipbuilding creating jobs and growth** in related industries
  - Defence policy should align with the **vision of "Viksit Bharat" and long-term economic growth.**

DISCOMs and the road ahead

Prelims: General Studies Paper - 1
Current events of national and international importance

Mains: General Studies - 3
Infrastructure: Energy, Ports, Roads, Airports, Railways etc.

1.Context

- **India's electricity sector, especially power distribution companies (DISCOMs)**, is beginning to show signs of improvement.
- There are **72 DISCOMs** in the country, including State-owned, private, and power department utilities.
- For many years, **DISCOMs suffered from high power losses (AT&C losses)** and a widening gap between Average Cost of Supply and Average Revenue Realised.

AT&C losses

- Aggregate Technical and Commercial losses mean **the total loss of electricity** faced by power distribution companies due to:
  - **Technical losses:** Power lost during transmission and distribution because of old wires, transformers, and leakage.
  - **Commercial losses:** Losses due to power theft, faulty meters, wrong billing, and non-payment of bills.

Average Cost of Supply (ACS): Cost to supply one unit of electricity.

Average Revenue Realised (ARR): Money earned from selling one unit of electricity.

ACS–ARR gap: It means the difference between the cost of supplying electricity and the revenue actually earned by a power distribution company.

- Due to **low tariffs and delayed State subsidies,** DISCOMs' losses and debt increased sharply between 2020-21 and 2024-25.

2. Long-Standing Loss Problem in Power Distribution

- In India, DISCOMs have long been associated with financial losses.
- Earlier **power bodies called State Electricity Boards (SEBs) also suffered continuous losses.**
- **Section 59 of the Electricity (Supply) Act, 1948** required State Electricity Boards (SEBs) to **earn a minimum profit of 3% or more**, but this provision was largely ignored, leading to long-term financial losses.

3.Recent Improvement

- Some DISCOMs have started improving due to steps taken by the Union government.
- In 2024-25, **DISCOMs reported an overall profit of ₹2,701 crore**, compared to earlier losses.
- AT&C losses **reduced from 22.62% to 15.04%,** showing better efficiency.
- The **ACS-ARR gap narrowed sharply,** improving cost recovery.
- Reforms like the **Revamped Distribution Sector Scheme (RDSS)** and **Late Payment Surcharge Rules** helped DISCOMs clear old dues in installments and improve finances.

(**Late Payment Surcharge Rules:** These rules allow DISCOMs to clear old electricity dues in installments (up to 48 EMIs) and reduce extra penalties.)

4. Payment Discipline and Sustainability Concerns

- Before the Late Payment Surcharge Rules, **DISCOM payment delays disrupted fuel supply and power generation.**

- After the Rules came into force on June 3, 2022, **old dues of ₹1.39 lakh crore were mostly cleared through EMIs.**
- However, **many DISCOMs showed profits mainly due to State government subsidies, not because of their own strong finances** (e.g., Tamil Nadu Power Distribution Corporation Limited).
- **Depending too much on subsidies** creates doubts about **the sector's long-term stability.**

5. Way Forward

- States should **separate farm and non-farm power lines to measure actual usage.**
- DISCOMs **should promote solar pumps in agriculture** to reduce electricity costs.
- **Free electricity for all should be avoided,** as **richer consumers benefit** more.
- **Strong political will and honest administration** are needed to make DISCOMs financially healthy and consumer-friendly.

Rethinking battery strategy in India: the case for sodium-ion technology

Prelims: General Studies Paper - 1
Indian Polity and Governance-Constitution, Political System, Panchayati Raj, Public Policy, Rights Issues, etc.

Mains: General Studies - 3
Achievements of Indians in science & technology; indigenization of technology and developing new technology.

1. Growing Importance of Batteries and Lithium-ion Dominance

- **Batteries are now essential for consumer electronics, EVs, power tools**, and energy storage systems.
- **Lithium-ion batteries (Li-ion) dominate globally** due to:
  - Stores a large amount of energy
  - Loses very little charge when not in use
  - Long cycle life
- **Global manufacturing capacity has expanded significantly**, reducing costs from about $1,100/kWh (early 2010s) to about $108/kWh (2025).
- However, **lithium-ion batteries depend on critical minerals** like lithium, cobalt, nickel, and graphite, creating supply-chain and geopolitical risks.

2. India's Battery Manufacturing Efforts and Challenges

- India launched the **Production Linked Incentive (PLI) scheme** for Advanced Chemistry Cells (2021).
- **Around 40 GWh manufacturing capacity has been allocated**, but deployment is still limited.
- India's upstream **ecosystem remains weak**:
  - Limited domestic lithium reserves
  - Underdeveloped mineral processing infrastructure
  - Continued import dependence
- This highlights the need to **invest in alternative battery technologies, especially sodium-ion batteries (SiBs)**.

3. Sodium-ion Batteries: Performance, Safety, and Manufacturing Advantages

- Sodium-ion batteries **store less energy than lithium-ion batteries**, but the **difference is decreasing**, especially when compared to lithium iron phosphate (LFP) batteries.
- A **major advantage** is safety:
  - Lower risk of overheating and fire.
  - Easier storage and transportation
  - Can be stored at zero volts without degradation
- Manufacturing compatibility:
  - Existing **lithium-ion production lines can be adapted** with minor changes.
- Material advantages:
  - Sodium derived from abundant resources (e.g., soda ash).
  - Using **aluminium instead of copper in battery components** reduces cost and supply risk.
- These factors **improve supply-chain resilience.**

4. Strategic Importance and Policy Recommendations for India

- Sodium-ion batteries **could become cheaper than lithium-ion by 2035.**
- Global sodium-ion **manufacturing capacity is expanding rapidly.**
- India should adopt a coordinated policy approach, including:
  - **Expanding PLI incentives** to include sodium-ion technologies
  - Supporting the **manufacturing of key battery components.**
  - **Updating safety standards and certification** frameworks
  - **Encouraging EV manufacturers to approve both lithium-ion and sodium-ion** platforms
  - Increasing **public funding for R&D** and demonstration projects
- Sodium-ion batteries can **strengthen energy security, industrial resilience, and the clean-energy transition.**

KEYWORDS

Revamped Distribution Sector Scheme (RDSS)

- The Revamped Distribution Sector Scheme (RDSS) is a flagship scheme launched in **2021 by the Ministry of Power to improve the quality and reliability of power supply.**
- Its main aim is to **improve the financial health and operational efficiency of State-owned DISCOMs** and ensure affordable 24×7 electricity.
- RDSS follows a **reform-based, performance-linked funding model,** where money is released only after meeting set targets.
- It is **implemented by nodal agencies Rural Electrification Corporation and Power Finance Corporation.**
- The scheme focuses on **smart prepaid meters, infrastructure upgrades, capacity building**, and solarisation of farm feeders under PM-KUSUM.

PM Surya Ghar: Muft Bijli Yojana

- Launched on **13 February 2024**, the PM Surya Ghar: Muft Bijli Yojana aims to provide **free electricity to 1 crore households through rooftop solar installations** by March 2027.
- It offers up to **40% subsidy (maximum ₹78,000)** and **collateral-free loans at around 7%** interest for systems up to 3 kW.
- The scheme promotes **decentralised solar energy**, reduces household electricity bills, and is expected to save the government ₹75,000 crore annually.
- It targets addition of 30 GW rooftop solar capacity, reduction of 720 million tonnes of CO_2, and creation of 17 lakh jobs.
- A **Model Solar Village** component provides **₹1 crore per district** to promote rural energy self-reliance.

Biopharma SHAKTI Initiative

- Biopharma SHAKTI was announced in the **Union Budget 2026-27** with an outlay of ₹10,000 crore over five years
- It aims to **strengthen India's ecosystem for biologics and biosimilars.**
- **Biologics** are **complex medicines made from living cells**, used to treat conditions like cancer and autoimmune diseases.
- **Biosimilars** are highly similar, **clinically equivalent versions of biologics**, developed after patent expiry and offered at lower cost.
- It aims to **make India a global biopharmaceutical hub** and **capture 5% of the global biopharmaceutical marke**t, while reducing import dependence.
- The initiative includes setting up three new NIPERs (**National Institutes of Pharmaceutical Education and Research**) and upgrading seven existing NIPERs.
- It proposes a network of **1,000+ accredited clinical trial sites** to boost research and innovation.

- Regulatory capacity will be strengthened through the **CDSCO (Central Drugs Standard Control Organisation)** to ensure faster, globally aligned approvals.

National Programme on Advanced Chemistry Cell (ACC) Battery Storage

- The **National Programme on Advanced Chemistry Cell (ACC) Battery Storage** was **approved by the Union Cabinet on 12 May 2021** with a budgetary outlay of ₹18,100 crore.
- The scheme aims to **strengthen the ecosystem for electric mobility and battery storage in India.**
- It **seeks to enhance India's manufacturing capacity of Advanced Chemistry Cell (ACC)** batteries by establishing giga-scale ACC and battery manufacturing facilities in the country.
- The scheme focuses on **achieving maximum domestic value addition.**
- The programme also supports the **Make in India initiative.**