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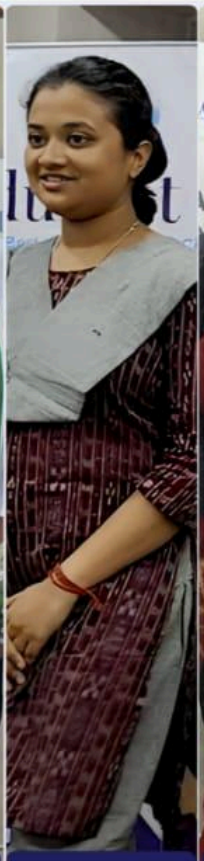

AIR 346 — BRATATI DUTTA

RESERVE LIST — PRIYA PUROHIT

Mains Daily News Analysis

1. Boost the Capacity of Legal Aid Systems in India

Relevance to UPSC

Mains: GS Paper II: Welfare schemes for vulnerable sections, Government policies and interventions, Separation of powers – Judiciary, Access to justice

Summary of the Article

- **Access to justice is a constitutional mandate**, but remains largely unfulfilled in practice.
- The **Legal Services Authorities Act, 1987** promises free legal aid to nearly 80% of the Indian population.
- However, in 2023–24, **only 15.5 lakh people accessed legal aid**—a 28% rise, but insufficient for the eligible population.
- The **India Justice Report 2025** highlights severe regional and infrastructural disparities, with just **one legal aid clinic for every 163 villages.**
- **Legal aid gets less than 1% of the total justice budget**, and NALSA's share has declined despite increasing State contributions.
- Per capita spending remains dismal—national average is ₹6, but states like **Bihar (₹3), UP (₹4), West Bengal (₹2) lag far behind.**
- The number of para-legal volunteers (PLVs) has fallen by 38% (from 22,000 to 14,000) between 2019–2024, due to poor remuneration and neglect.
- The **Legal Aid Defence Counsel (LADC) Scheme, launched in 2022**, shows promise with ₹200 crore utilised in 2023–24, operational in 610 out of 670 districts, but the budget has been cut for 2024–25.
- Structural weaknesses persist—**underfunding, low public trust, over-regulation**, and uneven quality of services.

Analytical Insights for Mains

- The issue reflects a classic implementation deficit—**constitutional promises are undermined by resource and administrative constraints.**
- **Legal aid services are heavily centralised** and often not tailored to local needs, stalling outreach in rural and remote areas.
- **Underpayment of PLVs and lawyers** leads to a lack of motivation and compromises quality.
- The **LADC scheme is a potential game-changer**, but requires institutionalisation, not tokenistic funding.
- **Decentralised governance and community involvement** are essential for building trust in formal justice mechanisms.

Way Forward

- **Increase budgetary allocation** in line with population needs.
- **Enable flexible**, localised utilisation of funds.
- Ensure **fair compensation and expansion of the PLV workforce**.
- Sustain and scale up LADC scheme with quality benchmarks.
- **Integrate legal aid with community justice systems** to build awareness and confidence.
- Implement monitoring and evaluation mechanisms to track outcomes and accountability.

2. Fiscal Health of Indian States in FY2025 – Trends, Concerns, and Outlook

Relevance to UPSC

Mains (GS Paper 3): Indian Economy and issues relating to planning, mobilization of resources, growth, development, and employment, Government Budgeting, Centre-State Financial Relations

Summary of the Article

Context:

Understanding the fiscal position of Indian states is crucial for assessing India's macroeconomic stability. **The Provisional Actuals (PA) for FY2025 from 17 major states** (covering ~90% of India's GDP) reveal significant trends in fiscal deficit, revenue deficit, and capital expenditure.

Key Highlights

1. Widening Fiscal Deficit

- Fiscal Deficit rose to ₹9.5 trillion (3.2% of GSDP) in FY2025 from ₹7.8 trillion (2.9% of GSDP) in FY2024.
- The rise was mainly driven by **higher revenue deficits,** with only a minor push from capital expenditure.

2. Surge in Revenue Deficit

- Revenue Deficit almost doubled to ₹2.1 trillion (0.7% of GSDP) in FY2025 from ₹1.1 trillion (0.4% of GSDP) in FY2024.
- **Caused by:**
  - **Slower growth in revenue receipts** (6.3% vs 7.9% in FY2024)
  - **Stable growth in revenue expenditure** at 9% YoY

3. Negative Implications of Revenue Deficit

- **Indicates less room for capital creation**, as borrowing is used for consumption.
- Share of capex in fiscal deficit declined to 78% in FY2025, from 80–90% in FY2022–24.

4. Capital Expenditure (Capex) Trends

- **Total capex in FY2025 PA**: ₹7.4 trillion, ₹678 billion higher YoY.
- But incremental capex was much lower than previous years' trend (₹910–1,120 billion during FY2022–FY2024).
- **Capex fell short of Revised Estimates by ₹1.1 trillion.**

5. March 2025 Capex Surge

- March capex rose 42% YoY to ₹2.2 trillion from ₹1.5 trillion in March 2024.
- **30% of annual capex was spent in March alone**, showing back-ended spending.
- This spike led to increased state government securities borrowing.

6. Role of Centre's Capex Loan Scheme

- **Total disbursement**: ₹1.5 trillion in FY2025 (up from ₹1.1 trillion in FY2024).
- 17 states received ₹1.13 trillion, funding over 40% of FY2025's incremental capex.

7. FY2026 Outlook

- States have budgeted ₹9.5 trillion capex for FY2026, a 29.2% rise YoY, implying ₹2.1 trillion incremental capex.
- This seems unrealistic as it is double the average incremental capex seen during FY2022–FY2024.

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- The increasing revenue deficit **signals a shift in state spending priorities**, potentially undermining long-term growth through reduced asset creation.
- The Centre's capex loan scheme has been **pivotal in sustaining states' capital expenditure; its continuity is essential for fiscal health.**

- Back-ended spending raises concerns over **the quality and efficiency of public investments and suggests a need for better fiscal planning and execution.**
- Given the unrealistic capex targets for FY2026, it is imperative that states prioritize effective fiscal consolidation and adopt revenue-enhancing reforms, including better tax administration and rationalized subsidies.
- **Reforms recommended by the Finance Commission and Pay Commissio**n will heavily influence medium-term state finances; states must prepare for post-GST compensation transition.

3. Adopt Formalisation to Power Productivity Growth

Relevance to UPSC:

Mains: GS Paper 3: Indian Economy – Employment, Labour Reforms, Formalisation, GS Paper 3: Inclusive Growth and Issues Arising From It

Summary of the Article:

- India's formal manufacturing sector is **increasingly relying on contract labour**, with its share doubling from 20% in 1999-2000 to 40.7% in 2022-23, across industries.
- This informalisation within the formal sector is driven not by labour flexibility or skill needs but **primarily to cut costs and avoid labour laws.**
- **Contract workers lack protections under the Industrial Disputes Act**, including safeguards against layoffs and retrenchments, making them highly vulnerable.
- **Wage disparities are stark**: Contract workers earned 14.47% less on average in 2018-19; in large enterprises, this gap was as high as 31%.
- In many industries, **labour cost savings from contract labour exceeded 50%,** even reaching 78–85% in some sectors.
- **Contract labour harms productivity**: Contract labour-intensive (CLI) enterprises show 31% lower labour productivity than regular labour-intensive (RLI) firms.
  - **Gap is worse in:**
    - Firms with <100 workers: 36%
    - Labour-intensive industries: 42%
- Principal-agent problems arise with third-party hiring, **reducing workforce stability and on-the-job training investment.**
- **Exceptions exist**: About 20% of formal manufacturing firms, especially large, high-skill, or capital-intensive CLI firms, show up to 20% productivity gains.

Analytical Insights for Mains:

1. Issue of Dualism in Labour Markets:

- Formal sector **adopting informal hiring practices** undermines the very objective of industrial formalisation.
- Highlights a **structural contradiction**: Statistical formalisation without real worker protection.

2. Labour Productivity Linkages:

- **Contractualisation weakens the employer-employee bond**, reducing incentives for training and innovation.
- Impacts **long-term competitiveness and growth of the manufacturing sector**.

3. Policy Dilemma: Flexibility vs Security:

- The **Industrial Relations Code (2020**) seeks a balance through direct fixed-term contracts but remains under-implemented.
- Without effective safeguards, **flexibility may lead to deeper informalisation**.

4. Need for Revival of Proven Schemes:

- Reviving PMRPY, which subsidised employer social security contributions, could reduce contract misuse.
- Such schemes **incentivise formal job creation without burdening small firms**.

5. Way Forward:

- Implement **Industrial Relations Code with safeguards**.
- Incentivise longer-term formal contracts via social security subsidies.
- Strengthen skilling and formalisation linkages for small and medium enterprises.

4. Strengthening India's Energy Security

Relevance to UPSC

Mains: GS Paper III: Infrastructure – Energy, Environment – Climate Change, Clean Energy Transition, Investment Models – PPP in Energy, Science & Technology – Green Hydrogen, SMRs

Summary of the Article

- Traditional focus on energy security (**access, affordability, reliability of fossil fuels**) is now inadequate.
- India must adopt a dual-track approach:
  - **Reduce fossil fuel consumption**
  - **Expand renewable sources like solar, wind, bioenergy**
- **Installed power capacity (June 2025): 476 GW**
  - **Thermal power:** 240 GW (50.52%)
  - **Non-fossil fuels**: 235.7 GW (49%)
  - **Renewables**: 226.9 GW (47.7%) – India ranks 3rd in solar, 4th in wind
- Power shortage dropped from 4.2% (2013-14) to 0.1% (2024-25)
- **100% village electrification achieved (2018) via DDUGJY**
- Tata Power's solar micro-grids aim to electrify 10,000 villages
- **EV target:** 30% penetration by 2030 with schemes like FAME II and PM E-DRIVE
- **EV battery market:** projected to reach USD 27.70 billion by 2028
- **Strategic Petroleum Reserves (SPR):** 5.33 million metric tonnes to cushion oil shocks
- **India's energy diplomacy:** through International Solar Alliance (ISA) and COP29 advocacy

Analytical Insights for Mains

Challenges in India's Energy Sector:

1. Dependence on coal: India plans to add 80 GW of coal capacity by 2031–32, contradicting climate goals.
2. Regulatory hurdles: Over 100 approvals needed for a 1 MW solar plant.
3. Lack of a **single nodal energy authority** causes fragmentation.
4**. Limited solar manufacturing:** Heavy import dependence on China for wafers and polysilicon.
5. Weak grid infrastructure: Storage capacity is only 442 MWh vs. 82.37 GWh required by 2026–27.
6. Energy access inequality: Despite village electrification, 2.4% households unelectrified, and many face supply quality issues.
7. Land and environmental conflicts: E.g., Barmer protests over Khejri tree destruction.
8. Financing gaps: Despite RBI's support, foreign capital inflow is limited.

Key Strategies for Advancing Energy Security:

- Simplify **regulations and fast-track project approvals**

- **Develop offshore wind**: Establish central clearance cell, seabed policy, Viability Gap Funding
- **Modernize grid**: Adopt smart grids, EV charging, V2G tech
- **Promote EPC capability**: Skilling, tech enhancement for project execution
- **Reform land laws**: Encourage agro-PV systems to reduce land conflict
- **Attract foreign investment**: Offer stable policies, fiscal incentives, and sovereign green bonds
- **Scale up green hydrogen**: Incentivize its use in steel, fertilizer, refinery sectors
- **Adopt SMRs**: For safe, modular, off-grid nuclear power
- **Expand WTE plants** and promote industrial energy circularity
- Leverage PPP models for **battery storage, grid upgrades, and offshore wind**
- Issue energy transition-linked green bonds tied to decarbonization goals

5. Turning Tariffs into Trade Opportunity

Relevance to UPSC

Mains GS Paper 2: International Relations – India-US relations, WTO compliance, GS Paper 3: Indian Economy – Trade, Manufacturing, MSMEs, Industrial policy

Summary of the Article

- The **US has imposed 25% tariffs on Indian imports**, along with penalties over India's defence and energy engagements with Russia.
- These **moves strain bilateral trade ties and impact India's export competitiveness**, investment inflows, and geo-economic standing.
- However, this challenge also opens up a strategic opportunity for India to:
  - **Strengthen domestic manufacturing**
  - Diversify export markets
  - **Move up the global value chains (GVCs)**
- India-US bilateral trade in 2024–25 stood at USD 131.84 billion.
- **A 50% cut in US demand could cause a USD 40 billion drop in Indian exports**, lowering GDP growth by 1% in FY26.
- Sectors like **textiles, seafood, gems, and SMEs** are particularly vulnerable.
- **Tariffs on Chinese goods may cause dumping in India**, affecting local producers.
- **Though sectors like electronics and pharma are currently safe**, future sectoral tariffs could hurt their competitiveness.
- Tariffs may also hamper India's shift toward high-value exports, restricting value chain advancement.

Analytical Insights for Mains

1. Strategic Opportunities for India

- **Integration into Global Supply Chains:**
  - Benefit from US 'friend-shoring' and 'China+1' strategies.
  - Expand role in **electronics, semiconductors, defence, APIs, and technical textiles**.
  - Focus on quality, tech readiness, and scale for long-term GVC presence.
- **Services & Digital Trade Diplomacy:**
  - Shift diplomacy focus toward services and digital commerce, where India is strong.
  - Leverage iCET to push norms on **data sovereignty, digital taxation, etc.**
- **Export Diversification & Manufacturing Push:**
  - Gain from China's lost export share (~USD 20 billion) in sectors like auto components.

- **Use PLI and Make in India schemes** to build resilience and boost exports from India or tariff-neutral countries.

- **Deepening Trade with Alternative Partners:**
  - Enhance ties with **EU, ASEAN, and LAC countries**.
  - Reduce overdependence on US markets.

2. Recommended Measures for India

- **Domestic Capacity Building:**
  - **Ramp up R&D, innovation, and product quality** in electronics, pharma, auto components, textiles.
  - PLI schemes and import substitution must be scaled, especially in semiconductors, APIs, solar modules.
- **Trade Agreements and Diplomacy:**
  - **Fast-track FTAs with EU, ASEAN, and others.**
  - Push for a **reformed India-US trade pact** that addresses non-tariff barriers and investment policies.
  - Aim for **horizontal diversification (new sectors)** and **vertical upgrading (high-value products).**
- **SME Protection and Targeted Support:**
  - Offer **interest subventions**, export incentives, and sector-specific assistance to vulnerable SMEs.
  - Promote **private sector investment** in quality enhancement and workforce development.
- **Countering Chinese Dumping:**
  - Enforce **WTO-aligned anti-dumping measures**.
  - Set up **real-time tariff monitoring.**
  - Use **solar panel import duty** as a precedent for protecting domestic sectors.
- **Structural Reforms and Infrastructure Push:**
  - Improve **infrastructure, logistics, and energy availability to cut costs.**
  - Implement reforms in land acquisition, MSME credit, and regulatory ease.

6. Transforming E-Waste Management in India

Relevance to UPSC:

Mains: GS Paper 3: Environment (Conservation, Pollution, Waste Management)

Summary of the Article:

- **India is the 3rd largest generator of e-waste globally after China and the USA**, producing 3.8 million metric tonnes (MMT) in FY24.
- E-waste increased by 151% from 2017 to 2024, with **lithium batteries alone contributing 700,000 MT in 2022.**
- The E**-Waste (Management) Rules 2022 introduced Extended Producer Responsibility (EPR)**, expanded product coverage (106 items from FY24), and integration of bulk consumers.
- Subsequent amendments in 2023 and 2024 focused on refrigerant management and EPR certificate trading platforms.
- **Key challenges include:**
  - Weak enforcement mechanisms
  - **Inadequate EPR pricing**
  - Non-compliance by large manufacturers
  - Illegal e-waste imports
  - **Regional disparities in infrastructure**
  - **Lack of public awareness**
  - Unclear roles for stakeholders

- India's inefficient e-waste handling leads to loss of valuable **resources (lithium, cobalt, nickel**, etc.) and foreign exchange losses (USD 1 billion by 2030).

Analytical Insights for Mains:

Challenges in E-Waste Management:

- **Enforcement Deficit:** Lack of audits, poor tracking of EPR certificates, and fraudulent practices (e.g., 600,000 fake plastic certificates in 2023).
- **Market Distortions**: Low EPR floor prices make formal recycling economically unviable, encouraging illegal and harmful recycling.
- **Resistance by Industry**: MNCs like Daikin, Hitachi, and Samsung challenged e-waste policy, citing regulatory overreach.
- **Infrastructure Gaps**: Recycling remains concentrated in select urban areas, with poor access elsewhere (e.g., Chandigarh).
- **Consumer Apathy**: Low awareness among scrap dealers and repair workers hampers proper e-waste disposal.

Reform Measures Suggested:

1. Formalizing the Informal Sector:
- Integrate **rag pickers as "e-waste heroes**" through training and certification.
- Offer tax incentives for formal recycling.

2. Strengthening EPR System:
- Set **viable floor prices.**
- Enable **robust digital tracking and auditing.**
- Adopt best practices from South Korea's EPR model.

3. Enhancing Rule Enforcement:
- Strengthen **CPCB and MoEFCC capacities**.
- Empower urban local bodies for monitoring.

4. Boosting Consumer Awareness:
- Launch mass awareness campaigns via **SHGs, RWAs, NGOs**.
- Highlight **collection centers and safe disposal systems**.

5. Encouraging Safer Design:
- Promote **Design for Environment (DfE) and lead-free soldering (SAC alloys).**
- Prevent planned obsolescence and mandate spare parts access, as in the EU's Right to Repair.

6. Expanding Recycling Infrastructure:
- Scale up collection centers and replicate models like **Delhi's e-waste park and Bhopal's e-waste clinic.**
- **Promote E-Waste Banks for community-level collection**.

7. Setting National E-Waste Targets:
- Like the EU, define per capita e-waste recycling targets to enhance accountability.

8. Investing in R&D:
- Focus on **innovative, efficient, and environment-friendly battery recycling technologies.**

7. Bridging the Digital Divide for Inclusive Growth

Relevance to UPSC:

Mains (GS2 & GS3): GS2: E-Governance, Government Policies, Transparency & Accountability, Vulnerable Sections, **GS3:** Inclusive Growth, Digital Economy, Cybersecurity, Startups, Science & Technology

Summary of the Article:

India's digital economy is rapidly expanding and is projected to contribute **one-fifth of national GDP by 2029-30, driven by innovations in fintech, AI, cloud technology, e-governance, and digital payments**. Flagship initiatives like Digital India, JAM Trinity, and UPI have revolutionized access to digital platforms, especially in rural and underserved areas.

Key Drivers:

- **Digital Payments:**
  - UPI processed 172 billion transactions in 2024, a 46% rise from 2023.
  - **Rural India accounts for nearly one-third of digital payment users**.
  - 55.7% of Jan Dhan accounts are held by women.
- **Smartphone & Internet Penetration:**
  - Over 900 million internet users in India.
  - **India ranks 3rd globally in economy-wide digitalization**.
  - 886 million active internet users in 2024, with 8% YoY growth.
- **AI & Cloud Technology:**
  - AI to contribute USD 967 billion to GDP by 2035.
  - **India holds 16% of global AI talent.**
  - Cloud market to reach USD 20.3 billion by 2027, with 24% CAGR.
- **Global Capability Centres (GCCs) & Startups:**
  - **55% of global GCCs are in India.**
  - India exported USD 162 billion in ICT services in 2023 (2nd globally).
- **Digitalisation of Traditional Sectors:**
  - 95% of BFSI transactions are digital.
  - Retailers adopt AR/VR/AI tools.
  - E-tailers like **Nykaa and FirstCry investing in physical stores**.
- E-**Governance Initiatives:**
  - Platforms like **DigiLocker, e-District, and MyGov** promote digital access and service delivery.

Analytical Insights for Mains:

Barriers to Inclusive Digital Transformation:

- **Digital Literacy Gaps:**
  - **Only 24% of population is financially literate**; lower among women and informal sector.
  - Digital exclusion persists among informal workers and micro-enterprises.
- **Adoption Barriers for Small Enterprises:**
  - 58% of merchants have not adopted digital payments.
  - Issues include **economic limitations, lack of trust, and fraud fears.**
- **Cybersecurity Risks:**
  - 13.42 lakh UPI frauds in FY24 involving ₹1,087 crore.

  - Cybercrimes tripled between 2022–2024.
- **Unregulated Digital Lending Platforms:**
  - Over 1,000 unregulated lending apps target vulnerable populations.
  - **RBI guidelines (2025) face enforcement gaps.**
- **Infrastructure Gaps:**
  - **India ranks 25th globally for mobile internet speeds.**
  - Fiberization rate at 44%, below the 70% target.
- **Regulatory Vacuums:**
  - DPDP Act 2023 yet to be fully implemented.
  - **Lack of regulation for AI, crypto, and platform economy.**

Way Forward / Measures Suggested:

- **Financial & Digital Literacy:**
  - Expand **PMGDISHA and NCFE programs.**
  - Involve SHGs, anganwadis, and panchayats in outreach.
- **Inclusive Digital Infrastructure:**
  - **Accelerate BharatNet** and adopt low-bandwidth tech.
  - Promote internet access as a utility, not a luxury.
- **Fintech Regulation & Consumer Protection:**
  - Enforce RBI's 2025 Guidelines and strengthen fraud redressal.
  - Conduct **regular audits of digital lenders.**
- **Responsible AI Use in Governance:**
  - Audit public sector AI algorithms for bias.
  - Encourage context-specific AI through R&D and sandboxes.
- **Cybersecurity & Data Protection:**
  - Strengthen **Cyber Swachhta Kendra across rural India and SMEs**.
  - Implement DPDP Act with GDPR-like frameworks.
- **Startup Ecosystem & Innovation:**
  - Expand **AIM and Startup India** to rural incubators.
  - Provide R&D incentives, tax breaks, and market access.
- **Digital Governance Standards:**
  - Create a **Digital Governance Standards Authority (DGSA).**
  - Annual digital audits of ministries with citizen dashboards.
- **Platform Economy Regulation:**
  - Implement Digital Competition Bill with focus on fairness and innovation.
  - Mandate algorithmic transparency and data portability.

8. Futureproofing India Against Climate Change

Relevance to UPSC:

Mains: GS Paper 3 – Environment, Disaster Management, Agriculture, Infrastructure, Economy, Climate change challenges and adaptation

Summary of the Article:

India is at a critical juncture in confronting climate change, **experiencing losses worth $79.5 billion in the last two decades** and facing escalating risks due to erratic monsoons, rising sea levels, and increased frequency of extreme weather events.

Key Climate-Related Threats:

1. Rising Double Whammy of Heatwaves and Flooding:

- Heatwaves and extreme rainfall are rising simultaneously, especially in Northern, Central, and Western India.
- **80%+ districts projected to be climate-vulnerable by 2030.**

2. Sea-Level Rise and Coastal Flooding:

- Coastal cities like Mumbai, Chennai, and Kochi face submergence risks.
- **Sundarbans may lose 80% of its mangrove cover by 2100.**

3. Water Scarcity and Groundwater Depletion:

- Per capita freshwater availability dropped by 73% since 1950.
- **India is already classified as "water-stressed".**

4. Rising Healthcare Burden and Vector-Borne Diseases:

- **Heat-related deaths rose 55% between 2000–2004 and 2017–2021.**
- Malaria and dengue outbreaks are increasing due to warmer temperatures.

5. Energy Security Challenges:

- Climate stress increases cooling demand and reduces hydropower reliability.
- Continued reliance on coal (70%) undermines climate goals.

6. Disruption in Agriculture and Food Security:

- Projected yield reductions by 2050: rainfed rice -20%, wheat -19.3%, kharif maize -18 to -23%.

7. **Economic Impact:**

- Potential GDP losses of 3–10% annually by 2100.

Challenges Undermining India's Climate Mitigation Efforts:

1. Weak Policy Enforcement & Regulatory Gaps:

- Fragmented governance and continued coal expansion (80 GW planned by 2032).
- 2023 Forest Conservation Act amendments weakened environmental safeguards.

2. Growth vs Sustainability Conflict:

- Projects like **Great Nicobar Island** approved despite environmental concerns.
- Loopholes in EIA process remain a concern.

3. Risks of Greenwashing:

- Green Credit Scheme lacks transparency; most **new "forest cover" is in non-forest areas.**

4. Urban Climate Vulnerability:

- Smart Cities Mission lacks strong integration of climate resilience.
- **6 of the world's 10 most polluted cities are in India.**

5. Underinvestment in Climate Adaptation:

- Adaptation spending still low despite rising threats.
- NAFCC downgraded to a non-scheme without explanation.
- **Projected need:** ₹85.6 trillion ($1.05 trillion) by 2030 for adaptation.

Measures to Enhance Climate Resilience and Adaptation:

1. Localized Climate Risk Mapping: Use AI, GIS, and micro-zonation for district-specific interventions.
2. Climate-Responsive Urban Design: Emphasize blue-green infrastructure, reflective materials, and updated building codes.
3. Agroecological Transition Zones: Promote millet-based, climate-smart agriculture in vulnerable regions.
4. Climate-Resilient Infrastructure Audits: Mandatory resilience audits for roads, railways, and power lines.
5. Decentralized Renewable Energy Clusters: Hybrid solar-wind-bio systems for disaster-prone rural areas.
6. Hydroclimatic Early Warning Systems: Use real-time alerts and indigenous knowledge for flash floods and GLOFs.
7. Integrated Coastal Buffer Zones: Combine mangroves, bioshields, resilient housing, and satellite monitoring.
8. Climate-Linked Skill Development: Launch a Green Resilience Skilling Mission for jobs in adaptive sectors.
9. Decentralized Aquifer Governance: Empower village-level water user groups for groundwater management.
10. Green Finance and Climate Investments: Mobilize private finance using green bonds, climate insurance, and policy incentives.
11. Promoting Climate Education: Integrate climate awareness in school curricula, community campaigns, and local governance.

Analytical Insights for Mains:

- India must move **from reactive disaster management to anticipatory climate adaptation**.
- Mainstreaming climate resilience into development planning is vital for meeting the **Panchamrit targets and SDGs 2, 6, 11, 13, 15, 16.**
- Strategies should focus on **localized solutions, community engagement, and private sector participation.**
- India's climate policy should prioritize adaptation equally **with mitigation, especially in agriculture, water, and urban infrastructure.**
- The interlinkage of climate vulnerability with health, economy, food security, and energy needs to be holistically addressed through multi-sectoral reforms.

9. Justice Behind Bars – Reforming Custodial Norms

Relevance to UPSC

Mains Syllabus: GS Paper II: Governance, Polity, Constitution, Human Rights, Institutional Reforms, GS Paper IV: Ethics in Governance, Accountability, Empathy, and Objectivity in Public Administration

Summary of the Article

Custodial deaths remain a serious human rights issue in India, despite constitutional protections and Supreme Court guidelines. **The recent custodial death in Tamil Nadu highlights the systemic issue of torture, forced confessions, poor policing practices, and lack of accountability.**

Magnitude and Trends:

- Over **11,650 custodial deaths** (police + judicial custody) reported between 2016–2022 – NHRC
- **2,739 deaths in 2024, including 155 in police custody**
- **India classified as "high risk" for torture by Global Torture Index 2025**
- Uttar Pradesh, Maharashtra, West Bengal, Tamil Nadu – states with highest custodial deaths

Key Challenges:

1. Third-Degree Methods & Structural Injustice:

- Used due to **lack of forensic training**, pressure to solve cases, poor capacity
- Disproportionate effect on marginalized communities (**SC/STs, daily-wage workers)**
- NCAT 2019: 60% of 125 custodial deaths were from poor, marginalized groups

2. Neglect of Police Soft Skills:

- Focus on equipment, not human rights training or psychological support
- **CCTV coverage either missing or bypassed**
- Mental health and human rights education rarely emphasized
- **Prakash Singh reforms (2006) yet to be implemente**d (esp. separation of investigation and law & order)

3. Overcrowded, Under-Resourced Prisons:

- **131% average occupancy rate, with over 75% undertrials**
- **Judicial delays, poor legal aid** worsen the problem
- Inadequate facilities and overcrowding lead to more custodial harm
- Conditions often dramatized in popular media like Criminal Justice

4. Legal & Institutional Inaction:

- **DK Basu guidelines, K.S. Puttaswamy judgment exist**, but torture persists
- No standalone anti-torture law, despite Law Commission's 273rd Report (2017)
- **India is yet to ratify UNCAT**
- NHRC recommended compensation in just 1,184 cases (2016–2022)
- Only 0.18% cases saw disciplinary action; no prosecutions

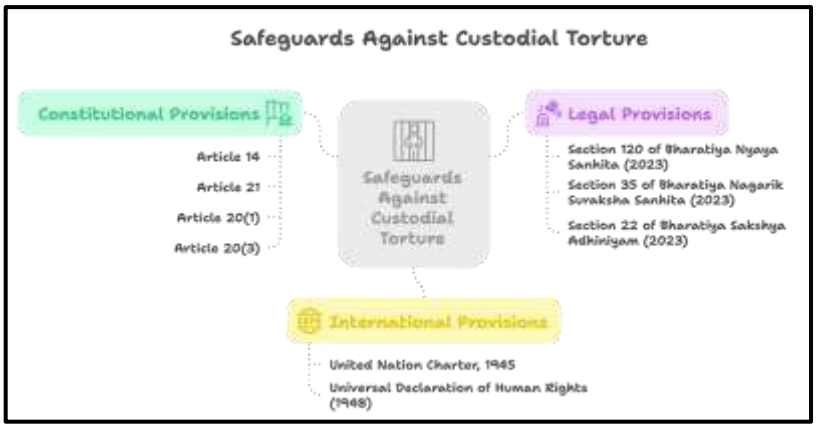
5. Weak Oversight and Civil Society Involvement:

- **Police Complaints Authorities (PCAs) are underpowered**, under-resourced
- NGO and media activism often limited by resources, legal pushback
- Low public awareness of rights and custodial violations

Analytical Insights for Mains

What Reforms Are Needed?

1. Legal and Policy Reforms:



- Enact dedicated **Anti-Torture Law** as per Law Commission 273rd Report
- Mandate video/audio recording of all interrogations
- Ratify **UN Convention Against Torture (UNCAT)**
- Compensate and rehabilitate victims' families with accountability for delays

2. Police Training and Wellness:

- Allocate at **least 5% of police budget to officer wellness and counseling**
- Include **human rights, trauma-informed policing, community engagement** in training
- **Adopt PEACE model (used in Norway, Canada, New Zealand)**
- Encourage ethics-driven policing over confession-based coercion

3. Technology and Surveillance:

- Install tamper-proof CCTV cameras in all police stations, monitored in real-time

- Ensure real-time digital custody logs with **geo-tagging, medical updates**
- Strict action against tampering with surveillance

4. Forensic-led Investigation System:

- Mandate forensic inputs at FIR stage
- Strengthen district-level labs and ensure trained forensic personnel
- **Integrate forensic SOPs into training to reduce confession-driven cases**

5. Strengthening Oversight:

- Empower PCAs with suo motu power, binding recommendations, and public reporting
- Implement **State Security Commissions as per Prakash Singh ruling**

6. Custody Audit as Performance Metric:

- Create **Custodial Audit Score for SHOs and Investigating Officers**
- Link promotions/incentives to ethical custodial practices
- Penalize stations with poor compliance and high custodial complaints

10. Agricultural Transformation for Bharat@2047

Relevance to UPSC

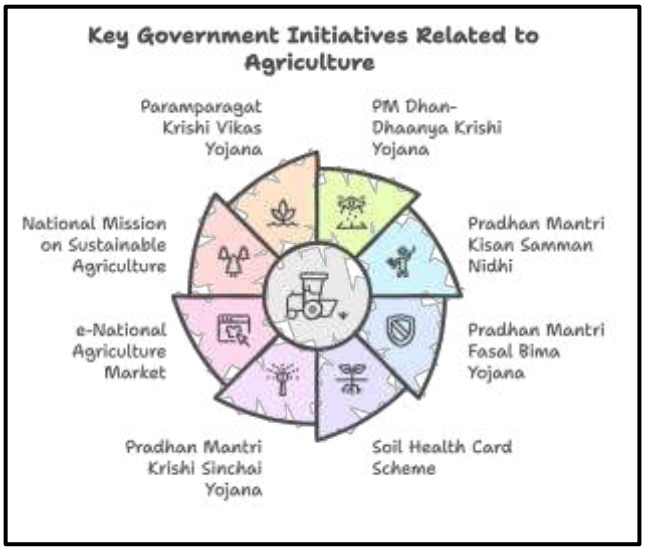
Mains: GS3: Agriculture, Food Processing, Infrastructure, Technology in Agriculture, Climate Change Impact, Inclusive Growth

Summary of the Article

India has moved from pre-1960s food insecurity to producing a record 353.96 million tonnes (2024–25), expanding into dairy, poultry, fisheries, and food processing. This **shift underpins the vision of Viksit Bharat by 2047**.

Key Developments Transforming Agriculture:

- **Agricultural Infrastructure**: Initiatives like **Agricultural Infrastructure Fund** (₹1 lakh crore target) and PMKSY modernize storage, processing, and logistics; GCF in agriculture grew 19.04% (2022–23).
- **Technology & Digitalisation**: Digital Agriculture Mission (₹2,817 crore), **AgriStack, e-NAM, AI, blockchain**, drones improving productivity & market access.
- **Sustainable & Organic Farming**: 1.76 million ha certified organic land, market size to reach ₹75,000 crore by 2025, exports up 47.5% in 5 years.
- **Livestock & Dairy:** India produces 24% of world's milk; genomic chips ("Gau Chip", "Mahish Chip") for cattle breeding.



- **Fisheries & Aquaculture**: PMMSY to boost fish production to 220 lakh tonnes; seafood exports up 60% (2014–2025).
- **Food Processing**: Sector to reach ₹3.45 lakh crore by 2025, employing 12.41% of organized manufacturing workforce.
- **Agricultural R&D**: 109 climate-resilient, biofortified crop varieties released in 2024 by ICAR.

Key Challenges:

- **Fragmented Land Holdings**: Over 85% small & marginal farmers cultivate 45% of land.
- **Poor Irrigation**: 61% farmers rain-fed; overuse of groundwater due to power subsidies.
- **Chemical Fertilizer Dependence**: 601 LMT consumed (2023–24); heavy MOP & DAP imports.
- **Climate Change**: 1°C rise in wheat-growing temps = 6.1% yield loss.
- **Credit Access Inequality**: Southern states get 47% of agri credit with just 17% sown area.
- **MSP Limitations**: Limited procurement, delayed payments, market distortion risk.
- **Post-Harvest Losses**: ₹1.53 trillion annual losses; 30–40% fruits & vegetables wasted.
- **Lack of Crop Diversification**: Paddy–wheat dominance, water-guzzling crops.

Proposed Reforms for Viksit Bharat@2047:

- **Digital Cooperative Farming Platforms** to pool land resources.
- Decentralized Micro-Irrigation Hubs via **Panchayat Water Councils**.
- Region-Specific Bio-Input Parks to replace chemical fertilizer dependence.
- **Agri-Fintech Models integrating Jan Dhan–KCC–land records for credit access.**
- Climate-Contingent Crop Planning Cells at district level.
- Rural Agri-Logistics Nodes under PM Gati Shakti.
- Agri-Nutrition Missions for crop diversification into **millets, pulses, oilseeds**.
- **Agri-Mechanization as a Service (AMAAS)** for drone & precision tool rental.
- **Smart Subsidy Transition linking benefits** to efficiency & sustainability.
- **MSP 2.0:** Dynamic, district-specific, digitally procured, covering more crops.
- Agri-Tech Innovation Zones for piloting frontier farming technologies.

Analytical Insights for Mains

- Structural transformation of agriculture is essential for rural prosperity.
- Technology-**led interventions (AgriStack, IoT, AI**) can address both productivity & market inefficiencies.
- Climate resilience must be embedded in planning to avoid production shocks.
- Subsidy reforms should shift **from input quantity to sustainability-linked performance**.
- Value chain integration (processing, logistics, export linkages) will raise farmer incomes.
- Institutional innovations like **digital cooperatives & AMAAS democratize access to high-end tech.**

11. Merchant Shipping Bill – Modernising India's Maritime Law

Relevance to UPSC

Mains: GS Paper 2: Government policies and interventions, effect on governance and ease of doing business.
GS Paper 3: Infrastructure – Ports, Shipping, Maritime Transport; Blue Economy; Environmental protection.

Summary of the Article

Parliament has passed two key legislations – **Merchant Shipping Bill, 2024 and Carriage of Goods by Sea Bill, 2025 –** replacing outdated colonial-era maritime laws to align India's maritime governance with global standards.
India's maritime laws were previously governed by the Merchant Shipping Act, 1958 and the Indian Carriage of Goods by Sea Act, 1925, which had become fragmented, outdated, and inadequate for contemporary challenges.

Merchant Shipping Bill, 2024

- **Replaces the Merchant Shipping Act, 1958.**

- **Structure:** 16 Parts, 325 clauses.
- **Seafarer Welfare:** Improves working conditions, safety, and protection for both Indian and foreign seafarers under Indian jurisdiction.
- **Safety & Emergency Response**: Strengthens ship safety, emergency preparedness, and marine pollution control.
- **Environmental Protection**: Integrates IMO environmental protocols to protect marine ecosystems.
- **Tonnage Promotion**: Incentivises Indian flag registration to boost domestic shipping capacity.
- **Simplified Compliance**: Consolidates provisions to reduce red tape and improve ease of doing business.

Carriage of Goods by Sea Bill, 2025

- **Repeals the Indian Carriage of Goods by Sea Act, 1925.**
- **Hague-Visby Rules Compliance**: Aligns India's cargo liability regime with international standards (followed by countries like the UK).
- **Commercial Efficiency**: Enhances contract transparency and improves dispute resolution mechanisms to reduce litigation.
- **Trade Facilitation**: Makes India a more attractive global shipping and logistics hub.

Strategic Significance

- **Strengthens India's blue economy framework.**
- **Promotes ease of doing business** in maritime logistics.
- Attracts **investment in ports, shipbuilding, maritime technology**.
- Supports maritime security architecture.
- Encourages green shipping initiatives and sustainable coastal development.
- **Generates employment opportunities in coastal states**.
- Enhances **India's global maritime competitiveness against Singapore, China, UAE.**

Analytical Insights for Mains

1. Why the reform was needed:

- Outdated colonial-era legislation lacked provisions **for modern environmental norms, safety measures, and global trade protocols.**
- Fragmentation created compliance hurdles and legal uncertainty.

2. How it strengthens India's maritime position:

- Alignment with **IMO standards improves global credibility.**
- Facilitates investment and technology adoption in shipping and ports.
- Positions **India as a preferred maritime jurisdiction for global trade routes.**

3. Challenges ahead:

- Need for effective enforcement of new safety and environmental measures.
- **Capacity building for maritime regulatory institutions.**
- Balancing commercial growth with sustainable maritime development.

12. Decoding China – Lessons for a Vulnerable India

Relevance to UPSC

Mains: GS Paper 2: India's bilateral relations with China; strategic autonomy; international economic diplomacy,
GS Paper 3: Industrial policy, infrastructure development, Make in India, technology transfer, supply chain resilience

Summary of the Article

The **sudden recall of over 300 Chinese engineers from Foxconn's iPhone 17 manufacturing units in Tamil Nadu and Karnataka is not a routine corporate decision, but part of a deliberate geoeconomic strategy by China to slow India's rise in high-tech manufacturing**. These engineers carried critical expertise needed to fine-tune advanced production lines — expertise that India still lacks.

This **move complements China's informal restrictions on rare earth exports and manufacturing equipment essential to electronics and EV production in India**. Such non-transparent barriers, enforced via administrative delays and verbal directives, effectively disrupt supply chains, raise costs, and cause uncertainty.

China views India's potential emergence as a credible manufacturing rival—especially amid Western supply-chain diversification—as a direct threat to its manufacturing dominance. This fear is compounded by China's internal vulnerabilities: ageing population, declining consumption, property crisis, and over-reliance on exports, which have led to a massive trade surplus nearing $1 trillion.

India, however, faces structural challenges:

- Underdeveloped manufacturing base dependent on imports of semiconductors, sensors, and engines.
- Infrastructure bottlenecks, bureaucratic hurdles, and policy inconsistency.
- **Over-reliance on "screwdriver technology**" assembly rather than end-to-end indigenous production.

China's economic statecraft involves using overcapacity to flood markets with cheap goods, suppressing competition, and expanding influence via strategic economic corridors in Pakistan, ASEAN, Africa, and Latin America.

The article stresses that for India to counter such tactics, it must invest in infrastructure, ease regulatory hurdles, promote indigenous R&D, and develop a self-reliant industrial ecosystem. Without this, aspirations to rival China will remain aspirational slogans.

Analytical Insights for Mains

1. China's Withdrawal as Strategic Disruption

- Not merely a corporate HR decision but a knowledge-transfer blockade.
- **Highlights asymmetry in industrial skill sets between India and China**.

2. Geoeconomic Context

- China's manufacturing supremacy threatened by India's demographic advantage.
- Rising friend-shoring efforts by the West could tilt global supply chains towards India.

3. India's Weak Spots

- Overdependence on foreign technology inputs.
- Infrastructure and governance bottlenecks restricting scalability.
- **Vulnerability to global policy shifts, e.g., US tariff adjustments.**

4. China's Economic Statecraft

- Weaponisation of overcapacity to undercut prices globally.
- Strategic control over critical raw materials like rare earths.
- **Long-term positioning through Belt and Road-type corridors.**

5. Way Forward for India

- **Boost indigenous R&D and manufacturing depth in electronics, EVs, AI.**
- Strengthen infrastructure and logistics efficiency.
- Policy consistency to attract and retain investment.
- Develop strategic autonomy in supply chains, especially in semiconductors and rare earths.

13. Reforming the Electoral System in India

Relevance to UPSC

Mains: GS Paper 2 – Salient features of the Representation of the People's Act, role of constitutional bodies, transparency in governance, electoral reforms.

Summary of the Article

The **Election Commission of India's Special Intensive Revision (SIR) of electoral rolls, conducted with limited transparency, highlights deep-seated issues in India's electoral system — including malpractices, criminalization of politics, voter list inaccuracies, media manipulation, and weak enforcement of rules**. The evolution of the electoral system from pre-independence limited representation to post-independence universal adult suffrage shows significant progress, but structural and operational gaps persist. The article outlines key challenges undermining elections and proposes urgent reforms such as MCC strengthening, ECI autonomy, inner-party democracy, digital campaign regulation, and enhanced VVPAT verification.

Analytical Insights for Mains

Evolution of Electoral System in India

- **Pre-Independence:**
  - **Government of India Acts (1858, 1861, 1892):** No real electoral representation.
  - **Morley-Minto Reforms, 1909:** Separate electorates for Muslims — first limited electoral representation.
  - **Montagu-Chelmsford Reforms, 1919:** Expanded electorate; dyarchy introduced.
  - **Government of India Act, 1935:** Provincial autonomy, larger electorates.
- **Post-Independence:**
  - **Constituent Assembly:** Universal adult suffrage adopted.
  - **Articles 324–329:** Constitutional framework for elections.
  - **First General Elections (1951–52):** 173 million voters, symbols for illiterate voters.
  - **ECI institutional changes**: Became a three-member body in 1993.
  - **61st Constitutional Amendment (1989):** Voting age reduced to 18.
  - **Right to Information Act (2005):** Increased political accountability.
  - **T.N. Seshan's tenure:** Strict MCC enforcement, EPICs introduced.
  - **Technological changes**: EVMs (1989), VVPATs (2013), NOTA (2013).
  - **Electoral Bonds Scheme** (2018): Struck down by SC in ADR vs. Union of India (2024).

Major Issues Undermining Electoral Reforms

1. Persistent Electoral Malpractices: Voter bribery, booth capturing, deepfake misuse, MCC violations. Record seizures of illicit cash in 2024 polls.

2. Voter List Accuracy Issues: 65 lakh names deleted in Bihar SIR 2025 draft rolls — risk of disenfranchisement.

3. Criminalization of Politics: 46% MPs in 2024 with criminal cases, 31% with serious charges.

4. Media Misuse & Digital Manipulation: Paid news, fake news, micro-targeting, weak MCMC monitoring.

5. Limited VVPAT Verification: Only 5 polling stations per assembly constituency checked.

6. Unregulated Election Expenditure: Estimated ₹1,00,000 crore spent in 2024 elections; no cap on party spending.

7. Gaps in Representation: Women's representation only 13.6% in 2024 LS; migrant disenfranchisement.

8. Lack of Inner-Party Democracy: Dynastic politics — 30% MPs from political families.

9. ECI's Independence Concerns: CEC Appointment Act, 2023 increased executive control; under SC scrutiny.

Key Reforms Needed

- **Simultaneous Elections**: Reduce costs & disruptions (Kovind Committee recommendation).
- **Stronger MCC Enforcement**: Authority to revoke Star Campaigner status; suspend party recognition.
- **ECI Independence:**
  - Budget charged on Consolidated Fund of India.
  - Appointment panel to include CJI.
- **Fast-Track Courts**: One-year disposal of criminal cases against politicians.
- **Mandatory Inner-Party Democracy**: Amend RPA 1951; penalties for non-compliance.
- **Regulation of Digital Campaigning**:
  - Ad transparency, deepfake takedown mandates, sponsor disclosures.
- **Curbing Freebie Culture**: Fiscal roadmaps for poll promises; voter education.
- **Improving Voter Turnout**: RVMs for migrants, mobile registration units, rural outreach.
- **Enhanced VVPAT Verification**: Larger sample size; totaliser machines for aggregation.

Conclusion

A future-ready electoral system in India must rest on **Empowerment, Equity, Efficiency, and Ethics**. Reforms ensuring transparency, inclusivity, and accountability will strengthen public trust and uphold democratic values. With strong institutions, empowered voters, and political will, India can set a global example of democratic resilience.

14. India's Advancements in Defence Technology: Opportunities and Challenges under Aatmanirbhar Bharat

Relevance to UPSC

Mains: GS Paper 3: Security challenges, role of technology in defence, indigenisation of technology, and defence procurement reforms

Summary of the Article

India is modernising its defence sector through **AI, robotics, cybersecurity, quantum technologies, and advanced manufacturing, in line with the Aatmanirbhar Bharat vision**. Key innovations include:

- **Artificial Intelligence in Defence**: 75 AI products launched at AIDef 2022; applications in predictive maintenance, target tracking, decision intelligence; USD 12.6 million annually earmarked for AI projects.
- **Autonomous Systems & Robotics**: UAVs for reconnaissance, combat, and logistics; indigenous NETRA UAV; DRDO's Daksh ROV for IED and hazardous material handling.
- **Cybersecurity & Electronic Warfare**: Strengthening C4ISR systems; DRDO's Shakti EW system; NTRO & DIA building cyber defence units.
- **3D Printing in Defence Manufacturing**: Used for missiles, UAVs, and aero engine parts (HAL–Wipro3D partnership).
- **Indigenous Production**: ₹1.27 lakh crore production in FY 2023–24; 65% equipment domestically produced.
- **iDEX & ADITI Schemes**: Driving R&D in strategic technologies and creating Technology Watch Tools.
- **Quantum Technologies**: DRDO's Quantum Technologies Research Centre; 1 km quantum secure communication demonstration by IIT Delhi.
- **Defence Industrial Corridors**: In Uttar Pradesh and Tamil Nadu, with ₹8,658 crore invested so far.
- **Strategic Partnerships**: BrahMos export to Indonesia; multilateral exercises with Japan, Philippines, Malaysia.
- **Indigenous Platforms**: INS Vikrant (76% indigenous content), T-90 Bhishma tank overhaul.

Analytical Insights for Mains

Opportunities & Strengths

- **Diversification of Defence R&D:** AI, robotics, quantum tech adoption.
- **Strengthened Domestic Base**: Rise in indigenous production and exports.
- **Global Engagement**: Strategic partnerships improving export market access.

Challenges

1. Incomplete Self-Reliance: 36% procurement budget still for imports; dependence on foreign jet engines, radars, missile seekers, stealth tech.
2. Cybersecurity Gaps: 92% organisations breached in 2024; shortage of 790,000 cybersecurity experts.
3. Budget & Bureaucracy: Delays in projects like S-400 Triumf procurement.
4. Technological Lag: Weakness in counter-space systems, AI-powered SSA.
5. Private Sector Barriers: Slow integration with procurement, inconsistent policy implementation.
6. Export Limitations: ₹23,622 crore exports still small share of global arms market.
7. Execution & Quality Issues: Timely delivery and after-sales reliability concerns.
8. Integration Challenges: Delay in Integrated Theatre Commands despite CDS reforms.

Way Forward

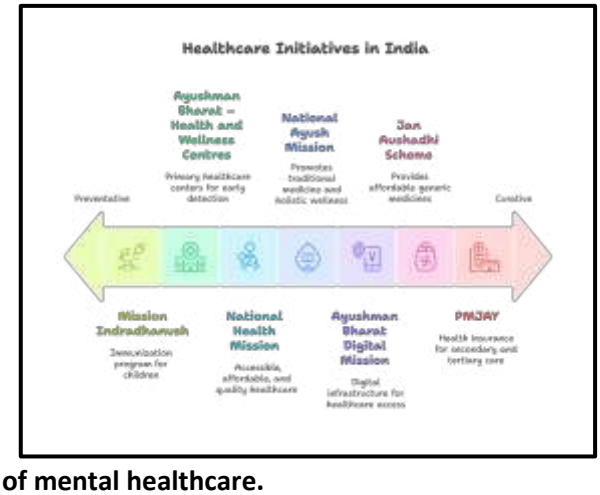
- **Public–Private Collaboration**: Joint R&D, incentives, tax breaks, subsidies for private defence manufacturing.
- **Boost Defence Exports**: Timely delivery, after-sales support, focus on niche markets like BrahMos & Tejas.
- **Technology Partnerships**: Joint ventures for critical tech transfer (e.g., jet engines).
- **'Buy Indian' Policy Priority**: Strengthen DPEPP and Positive Indigenisation Lists.
- **Dual-Use Infrastructure**: Develop regions like DSIR, Gujarat for military–civilian integration.
- **Skill Development**: Create a Defence Talent Academy for specialised workforce training.

15. Achieving Universal Health Coverage in India

Relevance to UPSC

Mains: GS2 – Issues relating to development and management of health, Government policies and interventions in the health sector, Inclusive growth and welfare of vulnerable sections; **GS3** – Science and Technology (Digital health innovations), Biotechnology (Pharmaceuticals and Medical Devices)

Summary of the Article



India's journey towards **Universal Health Coverage (UHC) has seen notable improvements in healthcare infrastructure, digital innovation, pharmaceutical production, healthcare financing, and reduction in out-of-pocket expenditure (OOPE).** However, barriers like inadequate rural infrastructure, shortage of health professionals, insurance gaps, low public expenditure, weak preventive healthcare focus, poor mental healthcare coverage, and data privacy concerns still persist. **Achieving UHC by 2030 will require holistic insurance coverage, workforce reforms, AI-driven digital healthcare, stronger regulations, empowered community health workers, innovation in pharmaceuticals, and prioritization of mental healthcare.**

Analytical Insights for Mains

Key Developments in India's Healthcare Sector

1. Expansion of Healthcare Infrastructure

- Public hospitals increased from 7,008 (2005) to 60,621 (2021) – **CAGR: 14.4%.**
- **PM-Ayushman Bharat Health Infrastructure Mission (2020**) and rapid growth of Ayushman Aarogya Mandirs (AAMs) – CAGR: 46.6% (2018–19 to 2023–24).

2. Digital Healthcare Delivery

- Ayushman Bharat Digital Mission (ABDM), **CoWIN, e-Sanjeevani, e-Hospital**.
- **"Scan & Share"** QR service reduces OPD waiting times.

3. Pharmaceutical Industry Growth

- **3rd largest producer globally by volume**, supplies 60% of global vaccines.
- Market size projected at USD 130 billion by 2030 (FICCI).

4. Increase in Healthcare Investment

- Public health expenditure rose from 1.2% (2014–15) to 2.1% (2022–23) of GDP.
- **NQAS-certified public facilities grew from 10 (2016–17) to 2,000+ (2023–24).**

5. Reduction in OOPE

- Shift from **RSBY to PM-JAY** (coverage: 12 crore families, ₹5 lakh per family/year, 1,900 packages).
- **OOPE reduced from 64.2% (2013–14) to 47.1% (2019–20).**

6. Community Engagement

- Role of **ASHAs, Jan Arogya Samitis, Mahila Arogya Samitis.**
- ASHA workforce grew from 8.95 lakh (2013–14) to 10.65 lakh (2023–24).

Key Barriers to Achieving UHC in India

- **Inadequate rural infrastructure** – only 0.6 beds/1,000 people (NHP 2021).
- **Shortage & uneven distribution** – WHO norm: 44.5 health workers/10,000, India: 20.6.
- **80% shortage of specialists at CHCs in rural India.**
- **Persistent OOPE & limited insurance penetration –** fell to 3.7% (2023–24).
- **Low public health expenditure** – only 2.1% of GDP, below 2.5% target.
- **Weak focus on preventive & primary care** – NCD deaths up from 37.9% (1990) to 61.8% (2016).
- **Poor mental health infrastructure** – only 0.75 psychiatrists/1 lakh people.
- **Data privacy risks** – ICMR data leak (80 crore records, 2023), AIIMS ransomware attack (2022).

Strategies to Achieve UHC

1. Expand Insurance to Cover Outpatient, Preventive, and Chronic Care

- Reform **PM-JAY to include diagnostics, medicines, and preventive screenings**.
- Modular products for chronic disease management.

2. Strengthen Health Workforce Capacity

- Rural service bonds, financial incentives, and fast-tracked career growth.
- **Align medical curriculum with community health needs.**

3. AI-Enabled Digital Healthcare Infrastructure

- Stable electricity, internet, and hardware at PHCs.
- Replicate **solar-powered PHCs in Chhattisgarh.**

4. Digital Connectivity of Healthcare Facilities

- Link hospitals for protocol sharing and knowledge exchange.
- **Mobile Health Units with e-health integration for remote areas.**

5. Unified Regulatory Framework for Private Sector

- Central authority for quality standards, pricing, grievance redressal.
- Integration with ABDM for real-time monitoring.

6. Empower Community Health Workers (ASHAs)

- Salaries + incentives, digital tools for telemedicine, training in NCD & mental health screening.

7. Boost Innovation & Self-Reliance in Pharma and Medical Devices

- Promote PPPs, increase R&D funding, strengthen API manufacturing.

8. Strengthen Mental Healthcare

- Higher funding, more psychiatrists, psychologists, counsellors.
- Integrate into primary health centres; expand Tele-MANAS.
- Public campaigns to reduce stigma.

16. India's Welfare Architecture – Equity, Efficiency, and Empowerment

Relevance to UPSC

Mains: GS2 – Welfare schemes for vulnerable sections, issues in implementation, social sector/service delivery; GS3 – Inclusive growth, governance issues, poverty alleviation.

Summary of the Article

According to **the International Labour Organization (ILO), India's social protection coverage doubled from 24.4% in 2021 to 48.8% in 2024, reflecting progress in welfare reach**. The Direct Benefit Transfer (DBT) framework has enhanced efficiency, but declining social sector spending and weakened transparency/accountability mechanisms threaten gains.

Key welfare programme achievements include:

- **MGNREGA** – 8.3% higher work demand in Dec 2024 vs. Dec 2023.
- **NRLM** – 10.05 crore rural women mobilized into 90.90 lakh SHGs.
- **PDS under NFSA, 2013** – benefits to 80.10 crore beneficiaries.
- **NHM** – engaged 12 lakh+ additional healthcare workers (FY 2021–24).
- **PMJAY** – 35.4 crore Ayushman cards issued, covering ~45% of the population.
- **NSAP** – 3.09 crore BPL beneficiaries covered.
- **POSHAN Abhiyaan** – improvement in child nutrition indicators (stunting down to 35.5%).
- **SSA** – elementary enrolment rose to 19.67 crore (2015–16).
- **PMKVY** – 1.48 crore candidates trained/oriented by June 2024.
- **PMJDY** – expanded from 147 million accounts (2015) to 520 million accounts (2024).
- **Digital India** – internet users grew to 970 million (2023).
- **PM-JANMAN** – allocation doubled to ₹300 crore in Budget 2025–26.

Analytical Insights for Mains

Achievements of Key Welfare Programmes

- **Poverty Alleviation & Employment:**
  - **MGNREGA** – immediate employment security.
  - **NRLM** – women-led SHGs as economic empowerment hubs.
  - **PDS** – large-scale food security under NFSA, 2013.
- **Health & Social Security:**
  - **NHM** – focus on rural and underserved healthcare access.
  - **PMJAY** – large-scale health coverage, Ayushman cards.
  - **POSHAN Abhiyaan** – measurable nutritional improvements.
- **Education & Skills:**
  - **SSA** – universal primary education progress.
  - **PMKVY** – large-scale skill training for youth employability.
- **Women & Child Welfare:**
  - **Sukanya Samriddhi Yojana, Beti Bachao Beti Padhao** – improved sex ratio, higher girls' enrolment in secondary education.
- **Financial & Digital Inclusion:**
  - **PMJDY, Digital India** – rapid expansion in financial and digital access.
- **Tribal & PwD Welfare:**
  - **PM-JANMAN, Sugamya Bharat Abhiyan** – targeted socio-economic and accessibility interventions.

Key Issues Undermining Effectiveness

1. Widening Inequality & Inadequate Coverage:
- Top 1% owns 40.1% of wealth; **"missing middle" (~40 crore) lack health protection**.
- Over 90% informal workforce excluded from most social security schemes.

2. Administrative Challenges & Leakages:
- **28% PDS grains leakages (ICRIER).**
- Ayushman Bharat fraud cases – invalid data, ghost beneficiaries.

3. Short-Term Focus:
- Schemes like **MGNREGA** offer temporary relief without long-term livelihood pathways.
- **MSP monoculture causing ecological harm.**

4. Weak Grievance Redressal:
- Quantity over quality in complaint resolution.
- Limited local-level accountability.

5. Digital Barriers:
- **45% lack internet access**.
- Aadhaar authentication failures exclude eligible citizens.

6. Budgetary Constraints:
- Social sector spending down to 17% of total expenditure in FY 2024–25 (lowest in decade).

7. Poor Monitoring & Evaluation:
- Social audits under MGNREGA poorly implemented – only 6 states >50% coverage.

Way Forward

- **Citizen-Centric Delivery**: Strengthen Gram Panchayats, community audits, local feedback systems.
- **Increase Social Sector Budgets**: Especially for health, nutrition, education; replicate Kerala model of preventive healthcare.
- **AI-Driven Targeting**: Use ML & Census data for dynamic beneficiary identification and de-duplication.
- **Reduce Leakages**: Upgrade biometric systems, use e-Rupi vouchers for direct benefit delivery.
- **Universal Digital Inclusion**: Combine PMGDISHA-style campaigns with offline service delivery.
- **Holistic Development**: Link skill development with employment guarantees; tackle structural poverty.
- **One Nation, One Entitlement**: Extend portability to pensions, scholarships, health insurance, housing.

17. Building Inclusive and Sustainable Employment in India

Relevance to UPSC

Mains: GS Paper 3: Employment generation, inclusive growth, informal sector, skill development, industrial growth, role of women in workforce

Summary of the Article

India has seen significant employment growth in recent years, aided by government initiatives, but challenges remain in **skill mismatches, informal sector dominance, gender disparity, and manufacturing slowdown.**

- **LFPR (15+ years) increased from 49.8% in 2017–18 to 60.1% in 2023–24**; WPR from 46.8% to 58.2%; FLFPR from 23.3% to 41.7%.
- Female unemployment fell from 5.6% to 3.2%.
- EPFO net additions more than doubled (61 lakh in FY19 → 131 lakh in FY24).
- **Self-employed share increased to 58.4% in 2023–24.**
- Agriculture's employment share grew from 44.1% to 46.1%, while manufacturing and services declined.
- **Unemployment rate fell from 6% to 3.2%, but underemployment and poor quality jobs persist.**

Analytical Insights for Mains

Key Challenges

1. Jobless growth – GDP growth not translating proportionately into employment; only 0.39% employment growth annually (2011–21) despite ~5.3% GDP growth.

2. Manufacturing stagnation – Share stuck at 12–14%; blue-collar wages remain low despite Make in India.

3. Skill mismatch – Only 8.25% of graduates in jobs matching qualifications; less than 5% workforce formally skilled (vs 80–96% in Japan/Korea).

4. Gender gap – FLFPR still half of male LFPR; barriers include social norms, safety, childcare absence.

5. Informal sector dominance – Employs 80% of workforce, contributes ~45% to GDP; poor access to social security.

6. Digital disruption – AI/automation risks displacing up to 60 million jobs in manufacturing by 2030.

7. Global trade tensions – US tariffs impacting export-linked industrial jobs.

8. Climate change – Loss of ~259 billion labour hours/year (2001–20), especially in agriculture and construction.

Strategies Suggested

1. Formalize informal sector – Social security, contracts, e-Shram portal integration, credit access for SMEs.
2. Modernize services sector – Focus on healthcare, tourism, education, wellness tourism.
3. Boost women's participation – Expand MUDRA, Mahila Shakti Kendras, enforce gender-neutral pay.
4. Implement labour codes – Flexibility + inclusivity for gig and contract workers.
5. Strengthen PPPs – Industry-linked skill development, entrepreneurship promotion.
6. Promote rural entrepreneurship – Agro-industries, CSCs, digital integration to reduce migration.
7. Enhance digital literacy – PMGDISHA training, MSME tech adoption.
8. Develop green workforce – Renewable energy job creation (e.g., Andhra Pradesh's 3 lakh jobs target).

18. Satellite Internet in India

Relevance to UPSC

Mains: GS Paper 2: Governance – Digital Inclusion, Connectivity in Remote Areas**, GS Paper 3:** Science & Technology, Security – Cybersecurity, Defence Communication, Disaster Resilience

Summary of the Article

Introduction

- Satellite internet is an **emerging transformative connectivity solution**, especially for remote and underserved regions.
- **With Starlink (by Elon Musk) set to debut in India**, the country's internet infrastructure could see a major upgrade.
- Unlike ground-based broadband (cables/towers), satellite internet offers high-speed access even in inaccessible or disaster-hit areas, ensuring operational continuity for civilian and military uses.

Significance

- **Ground-based broadband is cost-effective** in cities but inefficient for sparsely populated or disaster-prone regions due to high infrastructure costs and vulnerability.
- **Satellite internet advantages:**
  - **Terrain-independent coverage.**
  - Rapid deployment during emergencies.
  - Useful for mobile operations (ships, aircraft, oil rigs).
- **Can act as primary or backup connectivity.**

Key Features & Dual-Use Nature

- **LEO mega-constellations** (e.g., Starlink) comprise thousands of satellites.
- **Civilian uses**: healthcare, education, agriculture, transportation, disaster response.
- **Military uses:** secure communications, battlefield coordination, navigation.
- **Global examples:**
  - Viasat aided disaster relief during Hurricane Harvey.
  - Starlink supported Ukrainian defence in Russia-Ukraine war.
  - Indian Army uses satellite internet in Siachen Glacier.
- **Risks**: Unauthorised use by insurgents due to borderless nature.

Working

- **Space Segment**: Satellites with communication payloads (life: 5–20 years).
- **Ground Segment:** User terminals & antennas.
- **Orbit Types**:
  1. **GEO (35,786 km):** Large coverage, high latency, poor for real-time.
  2. **MEO (2,000–35,786 km):** Lower latency than GEO, needs multiple satellites.
  3. **LEO (<2,000 km):** Low latency, small & cheaper satellites, needs large constellations.

LEO Innovations

- Onboard processing in satellites.
- Optical inter-satellite links for direct satellite communication.
- Steerable antennas for seamless handovers.

Applications Across Sectors

- **Communications**: Rural internet, IoT networks.
- **Transportation**: Navigation, autonomous vehicle support, real-time logistics.
- **Disaster Management**: Early warning, resilient networks.
- **Healthcare**: Telemedicine, remote diagnostics.
- **Agriculture**: Precision farming, analytics.
- **Defence**: Secure comms, surveillance.
- **Environment/Energy**: Resource tracking, renewable energy support.
- **Future**: Direct-to-smartphone connectivity without terminals.

Challenges & Strategic Importance

- **Cost**: ~$500 hardware + ~$50/month service — still higher than terrestrial broadband.
- **Dual**-use risks → need for strong regulatory governance.
- **Strategic value for India:**
  - Bridge digital divide.
  - **Strengthen disaster resilience.**
  - Boost national security.
  - Influence international governance of satellite networks.

Analytical Insights for Mains

- **Digital Inclusion**: Can address rural-urban digital gap and support Digital India.
- **Disaster Resilience**: Ensures uninterrupted communications in floods, earthquakes, cyclones.
- **Security Dimension**: Enhances military operational capacity in border areas.
- **Regulation Need**: India must balance enabling technology adoption with security oversight.
- **Geopolitical Role**: India's stance in global space governance forums will influence technology access and control.

19. Supreme Court's Order on Street Dogs in Delhi – Legal, Constitutional, and Governance Implications

Relevance to UPSC

Mains: GS2 – Polity & Governance: Role of judiciary, judicial overreach, municipal governance, constitutional provisions on animal welfare. GS3 – Environment & Ecology: Human–animal conflict, sustainable urban governance.

Summary of the Article

On **11 August 2025, the Supreme Court of India ordered relocation of all street dogs in Delhi to shelters within eight weeks, citing rising fatal attacks on infants**. While aimed at public safety, this order raises concerns over legality, constitutionality, governance, and animal rights.

Background:

- **Trigger**: SC took suo motu cognisance of media reports on fatal street dog attacks.
- **Concerns**: Threats to infants, children, and elderly from unvaccinated street dogs.
- **History**: Human–canine conflict has been a recurrent policy and judicial issue in India.

Key Issues with the Order

1. Violation of existing law:

- Contradicts PCA Act, 1960 and ABC Rules, 2023, which prohibit relocation and mandate scientific population control.
- **Implication**: Undermines rule of law and sets precedent for bypassing statutes.

2. Ignoring judicial precedent:

- Violates stare decisis; similar matter settled in **AWBI vs People for Elimination of Stray Troubles (2024).**
- Frequent reopening of settled issues erodes judicial credibility and wastes resources.

3. Violation of natural justice:

- Breached **Audi alteram partem** – relevant parties' requests for impleadment ignored.
- Amicus curiae suggestions dismissed, lacking evidence-based reasoning or feasibility study.

4. Contradiction with Fundamental Duties:

- **Article 51A(g): Duty to show compassion to living creatures.**
- Threatening action against those opposing relocation undermines constitutional morality.

Underlying Governance Failure

- **Weak implementation of ABC and anti-rabies vaccination programmes**.
- **Poor euthanasia of confirmed rabid dogs**.
- Ineffective solid waste management, increasing stray dog populations.

Critical Analysis

- **Judicial overreach**: Bypasses statutory mechanisms and municipal duties.
- **Short-term approach**: May lead to overcrowded shelters and strain on public resources.
- **Root cause ignored**: Focus on dogs diverts attention from governance failures in municipal administration.

Way Forward

- **Strengthen local governance**: Full enforcement of ABC Rules, 2023 and vaccination drives.
- **Evidence-based judicial orders**: Use scientific data and public health evidence.
- **Public awareness**: Promote responsible pet ownership and humane treatment of animals.
- **Multi-stakeholder coordination**: Judiciary, executive, NGOs, and community collaboration.
- **De-polarisation**: Avoid framing as humans vs animals; target systemic governance lapses.

Conclusion

Human–canine conflict needs **data-driven, humane, and community-based solutions** aligned with **constitutional duties, scientific evidence, and sustainable governance.**

By empowering the third tier of government and ensuring strict adherence to the ABC Rules, 2023, India can achieve a balanced approach ensuring public safety, animal welfare, and legal integrity.

20. Ethanol for Energy, Environment and Empowerment

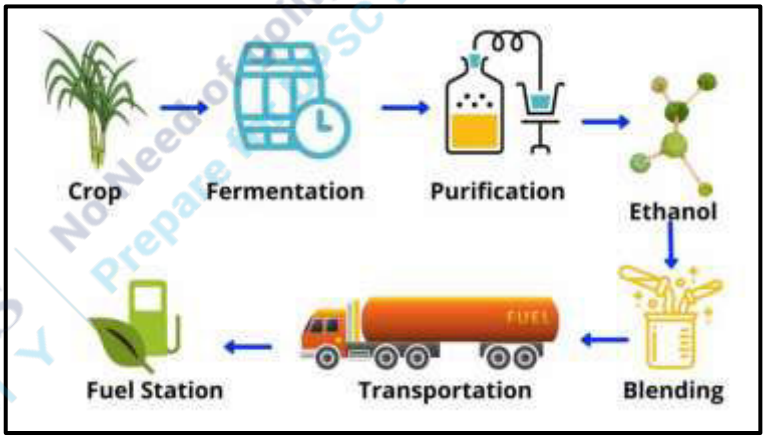
Relevance to UPSC

Mains (GS-3): Energy security, import dependence, agricultural diversification, Climate change mitigation, GHG reduction, circular economy, Inclusive rural growth and farmer income support

Summary of the Article

India's ethanol blending programme—targeting 20% blending (E20)—has major implications for energy security, farmer empowerment, and environmental sustainability.

- **Strategic Benefits:**
  - **Energy security & import reduction**: From ESY 2014–15 to July 2025, ethanol blending saved ₹1.44 lakh crore in forex and replaced 245 LMT of crude oil.
  - **Farmer income & rural economy**: Farmers may earn ₹40,000 crore in 2025; they become both "**Urjadaata" and "Annadata."**
  - **Environmental benefits**: Ethanol blending reduced 736 LMT of CO_2 emissions (equivalent to planting 30 crore trees); **sugarcane-based ethanol cuts GHGs by 65%, maize by 50%.**



  - **Circular economy**: Use of surplus grains, residues, and stubble for 2G ethanol (e.g., Panipat plant) reduces pollution from stubble burning.
  - **Global leadership**: India achieved E20 ahead of schedule; launched the Global Biofuels Alliance (GBA, 2023).
- **Key Challenges:**
  - **Food vs Fuel:** Diversion of rice/maize risks food price volatility (e.g., record 1 MT corn imports in 2024).
  - **Water scarcity**: Sugarcane-based ethanol consumes ~2,860 litres of water per litre of ethanol—unsustainable in water-stressed regions.
  - **Limited 2G adoption**: High costs/technology barriers—only a few plants operational.
  - **Pollution risks**: Ethanol distilleries classified "red category" due to vinasse discharge, acetaldehyde emissions, etc.
  - **Geopolitical/trade pressures**: US at WTO contests India's ethanol subsidies/import restrictions.
  - **Vehicle compatibility**: Only 10% of cars E20-ready; premature shift risks engine damage & efficiency loss.
- **Measures Needed:**
  - **Diversify feedstock**: Shift from sugarcane/rice to waste biomass, residues, non-food crops.
  - **Water-smart production**: Enforce water audits, drip irrigation, low-water fermentation.
  - **Regulatory reforms**: Create independent Ethanol Quality Regulatory Authority; ensure real-time monitoring & lifecycle audits.

- **Infrastructure upgrade**: Ethanol corridors, dedicated storage/blending facilities, blockchain-based supply chains.
- **Farmer empowerment**: Promote crop diversification, FPOs, crop insurance, minimum price guarantees.
- **Byproduct utilization**: Mandate zero-liquid discharge; valorize vinasse via biogas/compost.
- **Financial support**: Green bonds, viability gap funding, tax incentives to scale ethanol plants.

Analytical Insights for Mains

1. Triple Objectives (3Es): Ethanol blending advances Energy Security, Environmental Sustainability, and Economic Empowerment.

2. Energy Transition: By reducing oil imports and emissions, ethanol strengthens India's energy independence and aligns with Paris Agreement commitments.

3. Inclusive Growth: Stable ethanol procurement ensures farmer welfare and integrates agriculture into the bioeconomy.

4. Risks: Food security vs energy security, water stress, and environmental hazards could undermine long-term sustainability if not balanced.

5. Global Diplomacy: Ethanol policy has a geo-economic dimension—with WTO disputes and India's leadership in Global Biofuels Alliance.

Way Forward: A phased transition to 2G ethanol, robust regulatory oversight, and sustainable water practices is essential to ensure resilience.

21. Carbon Credits in India: Hopes and Challenges

Relevance to UPSC

Mains: GS-3: Environment, Conservation, Pollution, Climate Change; GS-2 → Governance, Policy Interventions

Summary of the Article

- Carbon Credits (CCs) represent **reductions/removals of greenhouse gases, measured in tonnes of CO_2 equivalent (tCO2e).**
- Concept emerged under Kyoto Protocol (1997) and strengthened by Paris Agreement (2015).
- **Carbon Markets:**
  - **Mandatory markets** (cap-and-trade, legally binding, ~$800 billion, projected $1.88 trillion by 2030).
  - **Voluntary markets** (CSR, brand image, ~$3 billion, projected $24 billion by 2030).
- **India's initiatives:** PAT Scheme, Renewable Energy Certificates (REC), Green Credit Programme, Energy Conservation (Amendment) Act 2022, Carbon Credit Trading Scheme (CCTS) under Indian Carbon Market (ICM), and updated Nationally Determined Contributions (NDCs) (2023).
- **Opportunities**: Climate commitments, competitiveness under EU CBAM, push for clean technologies, and financial growth from carbon trading.
- **Challenges**: Exclusion of major emitters, weak reduction targets, **MSME capacity issues, weak MRV (Monitoring, Reporting, Verification), market volatility, and minimal oversight in voluntary carbon credits.**
- **Concerns**: Greenwashing, lack of additionality, weak community benefits, non-permanence of sequestration, and inequitable access for developing countries.
- **Way forward**: Stronger MRV, community involvement, high-impact projects, alignment with global standards, and reframing CCs as an environmental responsibility rather than a tradable commodity.

Analytical Insights for Mains

1. Hope vs. Hypocrisy:

- While carbon credits create financial incentives for emission reduction, they often act as a license to pollute, delaying green transitions.

2. Global Competitiveness:

- EU's Carbon Border Adjustment Mechanism (CBAM) forces India to act on carbon pricing to protect exports.

3. Governance Gaps:

- Voluntary carbon market (worth $500 million in India) suffers from 90% value leakage in supply chains due to weak oversight.

4. Social Justice & Community Rights:

- Forestry-based CC projects often undermine tribal/community rights. A 2025 Nature study found half of India's forestry projects failed due to rights issues.

5. Climate Risks & Permanence:

- Extreme events like **Cyclone Tauktae (2021) destroyed forests in Gujarat, releasing CO_2 and negating CC gains → highlighting the fragility of carbon sinks.**

6. Policy Imperatives:

- Strengthen **MRV with real-time tracking & third-party verification**.
- Ensure equitable benefit-sharing through platforms like C-GEM.
- Focus on **hard-to-abate sectors (steel, cement, power) currently excluded from CCTS.**
- Promote high-impact mitigation projects like HFC-23 abatement.

22. Gender Equity as the Blueprint for a Stronger India

Relevance to UPSC

Mains: GS1: Role of women in society, social empowerment. **GS2:** Welfare schemes, governance, gender justice, issues related to women. **GS3:** Inclusive growth and development. **GS4:** Ethical values of equality, justice, and dignity.

Summary of the Article

- Gender equity is not only a moral imperative but also **an economic necessity for India's growth and global standing**.
- Women constitute nearly half of India's population, yet their **workforce participation remains one of the lowest in the world (~24%).**
- **Lack of gender equity in education, employment, and political representation** reduces India's potential for inclusive growth.
- Closing the gender gap in labour force participation could add $700 billion to India's GDP by 2025 (McKinsey estimate).
- India has taken positive steps: **constitutional guarantees of equality (Articles 14, 15, 16, 39), laws like Maternity Benefit Act, Domestic Violence Act, and policies like Beti Bachao, Beti Padhao, Stand-Up India**, and reservations in Panchayati Raj institutions.
- Yet, challenges persist: **patriarchal mindsets, wage gap, underrepresentation in STEM** and leadership positions, gender-based violence, and unequal access to healthcare and nutrition.
- Empowering women through education, skilling, financial inclusion, and safe workplaces is the blueprint for a stronger, resilient India.

Analytical Insights for Mains

- **Economic Growth**: Gender equity directly boosts productivity, innovation, and GDP growth.
- **Demographic Dividend**: With India's young population, women's empowerment ensures optimum utilization of human resources.
- **Social Justice**: Equality aligns with constitutional values of dignity, liberty, and social justice.
- **Governance & Representation**: More women in politics and leadership can make governance more inclusive and welfare-oriented.
- **Policy Gaps**: India needs better childcare facilities, strict enforcement of workplace safety laws, wage parity measures, and flexible work policies to bridge the gender gap.
- **Way Forward**:
  - **Promote STEM education and digital literacy among girls.**
  - Ensure women's access to credit and entrepreneurship opportunities.
  - Implement gender-sensitive budgeting at all levels.
  - Strengthen legal frameworks and shift societal mindsets through awareness campaigns.

23. A New Paradigm in India-Africa Engagement

Relevance to UPSC

Mains (GS Paper II): India and its neighbourhood & global relations; Effect of policies and politics of developed & developing countries on India's interests; India's role in the Global South; Issues in India-Africa partnership (trade, security, technology, climate).

Summary of the Article

India's recent engagement with Africa marks a strategic shift from paternalism to partnership, emphasizing shared heritage, education, digital cooperation, and inclusive diplomacy. **India's three-pronged approach leverages:**

1. **Heritage**: Shared anti-colonial history, cultural solidarity, and early support for African liberation.
2. **Present Cooperation**: Investments in education, digital technology, healthcare, and trade.
3. **Future-Oriented Ties**: Knowledge transfer, capacity building, and African-driven agenda-setting.

India is positioning itself as a credible Global South partner that emphasizes trust, equality, and African priorities, unlike Western conditional aid models or China's infrastructure-heavy, debt-inducing strategy.

Factors Underscoring Transformation in India-Africa Relations

- **Heritage, Harmony, and Strategic Partnership**
  - Early support for **African liberation movements** → foundation for modern collaboration.
  - Philosophy of "**Vasudhaiva Kutumbakam**" (world is one family) as guiding principle.
  - **AU's inclusion in G20 (2023) reflects India's role in enhancing Africa's global standing**.
  - 16 new diplomatic missions in Africa → stronger presence.
- **Educational and Capacity-Building Cooperation**
  - ITEC trained ~40,000 Africans in the past decade.
  - Establishment of **IIT Zanzibar; over 23,000 African students studying in India.**
  - Knowledge transfer empowers future African leadership.
- **Digital and Technological Transformation**
  - **UPI introduced in Namibia**; telemedicine projects across Africa.
  - Togo partnered with IIIT-Bangalore for national digital ID system.
- **Trade and Economic Integration**
  - Bilateral trade at USD 103 billion over past decade.

- **India = 3rd largest trading partner of Africa**.
- DFTP scheme supports African Least Developed Countries.

- **Strategic and Security Cooperation**
  - 5,000 Indian personnel in UN peacekeeping in Africa.
  - Maritime security cooperation through Djibouti Code of Conduct, Jeddah Amendment.
- **Health and Humanitarian Assistance**
  - **Vaccine Maitri initiative during Covid-19**.
  - Donations of Bhabhatron cancer machines, ambulances, medical equipment.

Key Areas of Friction

- **Economic Competition with China**
  - China invested USD 87 billion in West Africa (1995–2020).
  - **Debt-trap concerns in Angola, Ethiopia contrast with India's concessional credit**.
  - China's growing military & port presence (Djibouti) challenges India.
- **Infrastructure, Trade & Investment Challenges**
  - **Poor African infrastructure → high transaction costs.**
  - Corruption & transparency issues → India faced setbacks (e.g., Kenya airport deal annulled in 2024).
- **Governance and Political Instability**
  - 9 coups (2020–2023) in Africa → unstable political environment.
  - **Limits India's investment and conflict resolution role.**
- **Climate Action Divergence**
  - Africa's acute vulnerability (282 million undernourished in 2022) needs urgent adaptation.
  - India's efforts (e.g., International Solar Alliance) not fully matching Africa's needs.
- **Technology Divide**
  - **India promotes open-source digital public goods (UPI, Aadhaar).**
  - Chinese firms (Huawei controls 70% of Africa's 4G backbone) dominate ICT space.
  - India's digital diplomacy weakened by limited financing.
- **Diaspora & Labor Market Tensions**
  - 3 million Indians in Africa, especially in East & Southern Africa.
  - Resentment due to dominance in SMEs and trade.
  - **Africanisation of jobs vs. Indian firms bringing skilled labor from India.**

Measures India Can Adopt to Enhance Ties

- **Debt Relief and Financial Restructuring**
  - Advocate transparent debt restructuring mechanisms to counter debt traps.
  - Support **multilateral financial reforms**.
- **Expand ITEC Program**
  - Focus on **green energy, technology, agriculture training**.
  - Build long-term human capital development.
- **Champion Digital Partnerships**
  - Promote affordable internet access, UPI-based services, digital literacy.
  - Support **African tech startups & innovation hubs.**
- **Support Agricultural Transformation**
  - Promote **agro-tech solutions (AI, drones, precision farming).**
  - Reduce import dependency, ensure food security.

- **Invest in Renewable Energy & Climate Mitigation**
  - Collaborate on **solar, wind, hydro projects**.
  - Joint climate resilience programs.
- **Create Strategic Trade & Investment Zones**
  - Establish **SEZs & Industrial Parks aligned with AfCFTA goals.**
  - Enhance intra-Africa trade and industrialization.
- **Flexible Diplomacy & Strategic Dialogue**
  - Region-specific, consultative diplomacy.
  - Create platforms for African voice in global governance.
- **Champion Africa's Voice Globally**
  - Advocate for Africa in UNSC, WTO reforms.
  - Strengthen Global South solidarity.

Conclusion

India's engagement with Africa reflects a people-centric, trust-based, and future-oriented model, focusing on Africans' aspirations rather than needs. With emphasis on **education, digital transformation, climate resilience, and inclusive diplomacy, India is positioning itself as a credible Global South partner and a long-term development ally for Africa.**

24. Control of Election Officials: EC vs States

Relevance to UPSC

Mains (GS Paper II): Appointment, powers, functions of constitutional bodies, Federalism: Centre-State relations in elections, Electoral reforms and challenges in ensuring free and fair elections

Summary of the Article

The Election Commission of India (ECI) and the West Bengal government are in conflict over disciplinary authority on election officials accused of tampering with electoral rolls. The state argues that since no elections have been announced and the Model Code of Conduct is not in force, the ECI has no jurisdiction. This reignites debate on the extent of ECI's control once state officials are deputed for election duty.

- **Constitutional Vision:**
  - **Dr. B. R. Ambedkar** envisaged a **strong, independent ECI** with powers equivalent to that of the Supreme Court in terms of independence.
  - He rejected a **permanent ECI bureaucracy**, instead preferring state officials deputed to work under the ECI during elections.
- **1988 Amendments:**
  - **Representation of the People Acts (1950 & 1951)** amended to place election officials under ECI's authority.
  - **Section 13CC (1950 Act):** Chief Electoral Officers, District Election Officers, and Electoral Registration Officers deemed on deputation to ECI.
  - **Section 28A (1951 Act):** Returning officers, polling staff, and even police on election duty placed under ECI control from notification to declaration of results.
- **T N Seshan vs. Government (1990s):**
  - Asserted that officials on **election duty answered only to the ECI**.
  - Clashed with **government over powers (notably during Ranipet by-election 1993).**
  - ECI postponed 31 elections; Supreme Court gave interim relief affirming ECI's authority.
- **2000 Agreement (M S Gill era):**
  - Formalised by the Supreme Court settlement.

- **ECI empowered to:**
  - **Suspend officials for dereliction of duty.**
  - Replace errant officials and return them with conduct report.
  - Recommend disciplinary action binding on state/centre (to be acted upon in six months).
- This strengthened the institutional authority of ECI.

- **West Bengal Standoff:**
  - State refusing action despite ECI directives.
  - **Options before ECI:**
    1. Summon Chief Secretary (already done).
    2. Seek Centre's intervention to enforce 2000 framework.
    3. Approach Courts under RPA, 1950 & 1951.
  - Reflects that legal powers exist but enforcement faces resistance from states.

Analytical Insights for Mains

- **Federal tension**: The dispute reflects federal friction where states resist centralised oversight of their officials.
- **Legal vs. Practical Authority**: While laws (1988 amendments, 2000 settlement) empower the ECI, practical enforcement depends on state cooperation.
- **Institutional credibility**: Resistance by states can undermine the perception of ECI's independence and its ability to conduct free and fair elections.
- **Need for Reform**: Possible reforms could include:
  - Codifying disciplinary powers of ECI in the Constitution itself.
  - Creating a separate Election Service cadre for greater autonomy.
  - Time-bound judicial remedies when disputes arise.

25. Pathway to a Plastic-Free and Sustainable India

Relevance to UPSC

Mains: GS3 (Environment, Conservation, Pollution Control, Waste Management, Sustainable Development, SDGs)

Current Scenario & Institutional Mechanism

- India generates ~9 million tonnes of plastic waste annually (~20% of global total), far higher than Nigeria (3.5 mt), Indonesia (3.4 mt), China (2.8 mt).
- **Global trend**: Plastic waste projected to rise from 353 mt (2019) → 1,014 mt (2060). India will be a major contributor.
- **Economic loss:** USD 133 billion material value from plastic packaging waste by 2030 (FICCI).

Institutional Mechanisms:

- **Solid Waste Management Rules, 2016** – Segregation at source, user fees, scientific disposal.
- **Plastic Waste Management Rules, 2016** – Extended Producer Responsibility (EPR), plastic bag thickness ↑ to 50 microns, coverage extended to rural areas.
- **PWM Amendment, 2018** – Phased out multi-layered plastics (MLP), mandatory registration for producers under CPCB.

- **PWM Amendment, 2021** – Ban on Single-Use Plastics (SUPs) by 2022, thickness ↑ to 120 microns, stronger EPR.
- **PWM Amendment, 2022** – Mandatory recycling/reuse targets, environmental compensation, promotion of circular economy.
- **PWM Amendment, 2024** – Certification for biodegradable plastics, mandatory reporting of pre-consumer plastic waste, tighter compliance.

Key Challenges in Plastic Waste Management

1. Inadequate Infrastructure

- **77% urban waste → open landfills (e.g., Ghazipur, Delhi).**
- Only 60% plastic recycled, mostly informal sector.
- India burns 5.8 mt/year, leaks 3.5 mt/year into environment.

2. Weak EPR System

- Reliance on self-reporting, poor monitoring.
- **40,000+ registrations but major polluters underrepresented**.
- 7 lakh fake recycling certificates (38× higher than real capacity).

3. Poor Policy Execution

- Fragmented governance (ULBs, states, CPCB).
- Despite **SUP ban, India's SUP packaging share = 43% (global avg = 35%).**
- Informal sector (~60% recycling workforce) excluded from formal system.

4. E-commerce & Packaging Boom

- 1.2 mt plastic waste (2023) from e-commerce sector.

5. Lack of Alternatives & Innovation

- **Bioplastics cost 2–5× higher than normal plastics.**
- Consumer preference for cheap convenience plastics.

6. Low Public Awareness & Resistance

- Only 42% aware of SUPs (2025 study).
- Only 17% households segregate waste (NITI Aayog 2023).

Strategies for Strengthening Plastic Waste Management

- **Decentralized Waste Management**: Community/ward-level MRFs, AI-based segregation, reduced transport costs.
- **Micro-level Waste Segregation**: Incentives, recognition models (e.g., Indore Model); learn from Germany/Sweden/Singapore.
- **Strengthened EPR**: Blockchain-based tracking, geo-tagged networks, third-party audits, integration of informal waste workers.
- **Market for Plastic Alternatives**: Standards for biodegradable materials; Vadodara cotton bag vending machines; agro-waste-to-packaging linkages for rural employment.
- **Formalizing Informal Sector**: Recognize 1.5–4 million waste pickers as "environmental service providers"; model like Pune SWaCH cooperative.
- **Support for SMEs**: Subsidies, training, technology for small businesses to adopt sustainable alternatives.
- **Tech-Driven Enforcement**: AI surveillance, citizen reporting apps, centralized digital penalty system.
- **PPP for Tech Adoption**: Waste-to-energy, plastic-to-fuel, recycling startups, 3D printing from recycled plastics.
- **Awareness & Education Campaigns**: "Give Plastic-Take Gold" model in Kashmir; integrate waste education in schools.

Conclusion

- India's plastic crisis requires a circular economy model – reduce, reuse, recycle at source.
- **SDG 12 (Responsible Consumption & Production) must guide policy.**
- A mix of **enforcement, innovation, community participation, and industry accountability** will ensure a plastic-free, sustainable India.

26. India's Democracy is Failing the Migrant Citizen

Relevance to UPSC

Mains: GS2 – Governance (issues of inclusion, role of ECI, rights of citizens); GS1 – Indian Society (migration and its challenges)

Summary of the Article

- Nearly **3.5 million voters in Bihar (4.4% of total electorate) have been deleted during the Special Intensive Revision (SIR)** of electoral rolls as "permanently migrated" due to absence during verification.
- **Migration in Bihar is a survival necessity (circular and seasonal),** but the state interprets this mobility as "abandonment of voting rights."
- This has **created a silent crisis of disenfranchisement**, where migrants are unable to vote either in their workplace (destination states) or in their home states.
- India's electoral system assumes a sedentary citizen, making voter registration dependent on proof of residence and in-person verification — both difficult for migrants living in slums, rented rooms, or temporary shelters.
- **Double exclusion**: Migrants are discouraged from registering in host states due to regionalism, sub-nationalism, and job quota politics, while being deleted from home-state rolls for absenteeism.
- **A 2015 TISS study (funded by ECI) confirmed that migrants face a triple burden:**
  1. Administrative barriers (residence proof, verification).
  2. Digital illiteracy limiting access to online services.
  3. Social exclusion as outsiders/political threats.
- **States with high migration outflows (e.g., Bihar) show lower voter turnout (53.2%)** compared to states with fewer migrants (e.g., Gujarat – 66.4%, Karnataka – 70.7%).
- Migration data shows 7 million annual outflow from Bihar, but many returning for festivals find their names already deleted from rolls.
- The **problem mirrors challenges in the ONORC scheme, where uptake among migrants remains very low due to dual residency needs, fear of losing entitlements, and bureaucratic hurdles.**
- **Key reform needed**: A portable and flexible voter identity system, ensuring migrants can vote irrespective of mobility.

Analytical Insights for Mains

- **Democratic Deficit**: Migration is treated as disqualification, contradicting universal adult suffrage under Article 326.
- **Structural Bias**: Electoral systems are designed for sedentary citizens, ignoring India's reality of seasonal and circular migration.
- **Exclusionary Federalism:** Host states resist migrant registration due to fears of altered political balance; origin states delete them for absenteeism — creating systemic disenfranchisement.
- **Silent Voter Purge**: Bihar's SIR may trigger the largest post-Independence disenfranchisement, disproportionately affecting poor migrants.

- **Reform Pathways:**
  - Adopt portable voter ID linked to Aadhaar/residency flexibility.
  - Use **cross-verification between origin and destination rolls instead of deletions.**
  - Empower panchayats and civil society groups for outreach and re-registration drives.
  - Replicate Kerala's migration surveys to map and integrate migrant voters.
- **Parallel with Welfare Portability**: Just as ONORC attempts ration portability, electoral systems must adopt voter portability to ensure inclusiveness.

27. India's Climate Taxonomy: From Policy to Practice

Relevance to UPSC

Mains (GS Paper II & III): GS2: Governance – accountability, regulatory mechanisms, transparency**, GS3:** Environment – climate finance, sustainable development, international agreements

Summary of the Article

- In May 2025, the **Ministry of Finance released India's draft Climate Finance Taxonomy for consultation**.
- **Purpose**: To channel climate-aligned investments, reduce greenwashing, and guide investors on which sectors and technologies support mitigation, adaptation, or transition.
- It is **designed as a "living" framework**, meant to evolve with India's domestic priorities and global obligations.
- **Challenge**: Its effectiveness depends on whether adaptability is matched by clear review mechanisms, legal clarity, and institutional accountability.

Review Architecture:

- **Annual Reviews** → Address implementation gaps, policy shifts, and stakeholder feedback with fixed timelines, documentation standards, and mandatory public consultations.
- **Five-Year Reviews** → Deep reassessment aligned with global carbon markets, evolving climate finance definitions, and India's NDC cycle under the UNFCCC global stocktake.
- Together, these ensure the taxonomy remains both responsive in the short term and resilient in the long run.

Substantive Aspects:

- **Legal Coherence**: Alignment with **Indian laws (Energy Conservation Act, SEBI regulations, Carbon Credit Trading Scheme)** and harmonisation with international obligations. Removal of redundancies, clear overlaps, and synchronisation with green bonds, blended finance, and risk disclosures.
- **Content Clarity**: Must remain clear, accessible, and technically accurate. Definitions should evolve with market standards. Quantitative thresholds (emission reduction, efficiency benchmarks) must be updated with data and feedback.
- **Inclusivity is crucial**: taxonomy must allow MSMEs, informal sector, and vulnerable communities to participate via simplified entry points, phased compliance, and realistic expectations in agriculture and small manufacturing.

Institutionalising Accountability:

- A **dedicated unit within the Department of Economic Affairs** (Ministry of Finance) should oversee reviews.
- **Public dashboards** → Collect inputs, track challenges, and publish reports for predictability and transparency.
- Annual summaries & five-year revisions should be made public to enhance investor confidence and ensure alignment with carbon markets, green bonds, and disclosure frameworks.

Conclusion:

- Rollout coincides with major shifts in India's climate finance ecosystem: **Carbon Credit Trading Scheme, green bonds, and climate-aligned public investments.**
- A weak or opaque taxonomy risks undermining these reforms.
- For credibility, the **taxonomy must truly be a "living document"**, sustained by active review, transparent revision, and structured engagement.

Analytical Insights for Mains

- **Significance**: Provides India with a common reference point for climate finance, boosting credibility in global markets.
- **Governance Challenge**: Balancing flexibility with accountability – avoiding ambiguity while allowing adaptability.
- **Inclusivity Concern**: Without tailored provisions for MSMEs and vulnerable communities, taxonomy risks becoming elitist.
- **Global Relevance**: Aligns with Paris Agreement obligations and strengthens India's case in carbon market negotiations.
- **Way Forward:**
  - Strong legal and institutional framework for periodic review
  - Transparent public engagement to reduce greenwashing
  - Harmonisation with existing fiscal tools and global taxonomies

28. Revolutionizing India's Judicial System

Relevance to UPSC

Mains (GS-II): Structure, organization, and functioning of the judiciary, Separation of powers and judicial independence, Issues relating to access to justice, pendency, judicial reforms, Role of technology, ADR, and accountability in judicial delivery

Summary of the Article

The **Supreme Court of India reduced case pendency by 4.83% in 100 days, showcasing how systemic reforms can address delays**. However, the challenges of "justice delayed is justice denied" persist at lower levels. While progress in **digital transformation, ADR, and fast-track mechanisms has been made, India still faces structural issues of pendency, vacancies, infrastructure gaps, accountability, and access to justice**. Sustainable reform requires systemic, data-driven, and people-centric measures.

Key Reforms Introduced

- **Institutional and Mission-Based Reforms:**
  - **National Mission for Justice Delivery and Legal Reforms (2011)** – to reduce delays and arrears.
  - **Fast Track Courts (FTCs)** – 800+ functional (Oct 2024), deal with heinous crimes, cases involving women, children, senior citizens.
  - **National Judicial Data Grid (NJDG)** – covers 18,735 courts, tracks pendency and case flow.
- **Legislative Measures:**
  - Commercial Courts (Amendment) Act, 2018, Criminal Laws (Amendment) Act, 2018, Arbitration Act Amendments.
  - **Jan Vishwas Act, 2023** – decriminalized 183 provisions across 42 laws, easing court burden.

- **Digital Transformation:**
  - **e-Courts Project** – e-filing, video conferencing, virtual courts, eSewa Kendras.
  - **WAN Project** – 99.5% connectivity, video conferencing in 3,240 courts & 1,272 jails.
- **Legal Aid & Pro Bono:**
  - **Tele-Law (2017**) – connects citizens to legal advice via CSCs.
  - **NyayaBandhu Platform** – registration of pro bono advocates.
- **Alternative Dispute Resolution (ADR):**
  - Pre-Institution Mediation (PIMS) mandatory for commercial disputes.
  - Lok Adalats & Arbitration with prescribed timelines.

Major Challenges

- **Mounting Pendency**: Over 5 crore pending cases; 1,500+ cases pending for 50 years+.
- **Judicial Vacancies**: 33% posts in High Courts vacant; judge-population ratio at 21 per million (Law Commission recommended 50).
- **Infrastructure Deficit**: 4,250 courtrooms & 6,021 residences short; only 41% courts with video conferencing facilities.
- **Judicial Accountability**: No robust mechanism; impeachment ineffective; opaque collegium system.
- **Access to Justice**: 80% eligible for free legal aid, but only 1% avail; 76% undertrial prisoners in jails.
- **Diversity Deficit**: Only 14.27% women judges in High Courts; caste & regional representation skewed.
- **Judicial Activism vs Overreach**: Important role (Vishaka, Maneka Gandhi), but concerns of overstepping (Electoral Bonds case).
- **Executive Interference**: Delays in appointment clearance; judge transfers; Rajya Sabha nomination of ex-CJI raises quid pro quo concerns.

Way Forward / Needed Reforms

- **Technology & Case Management:**
  - Expand e-**Courts, AI tools (SUVAS, SUPACE), and FASTER system** for speedy bail orders.
  - Adopt Singapore's ICMS model.
- **Promote ADR:**
  - **Accelerate Mediation Act, 2023 implementation**.
  - Expand mediation centers, train mediators, incentivize ADR.
- **Appointments & Vacancies:**
  - Reform **collegium, consider Judicial Appointments Commission.**
  - **Establish All India Judicial Service (AIJS).**
  - Raise retirement age (UK model: 75 years).
- **Strengthen Legal Aid & Access:**
  - Improve NALSA funding, expand mobile legal clinics, integrate law schools for pro bono work.
  - **Expand Tele-Law to rural and marginalized groups.**
- **Infrastructure:**
  - Establish National Judicial Infrastructure Authority of India (NJIAI).
  - Ensure flexible use of CSS funds; mandate CAG audits for utilization.
- **Specialized Courts & Tribunals:**
  - Expand beyond NCLTs & POCSO courts to environmental, cyber, and IPR disputes.
- **Transparency & Accountability:**
  - Encourage live streaming, multilingual judgments, judicial performance evaluation.

- **Training & Sensitization:**
  - Introduce **compassion training, continuing legal education**.
  - Use **Bangalore Principles of Judicial Conduct as a framework.**
  - Ensure **gender sensitivity** (SC handbook on avoiding gender-unjust language).

Analytical Insights for Mains

- **Justice delayed** = erosion of democracy → pendency undermines Article 21 (Right to Life & Liberty).
- **Judicial reform is not just institutional but societal** – people must demand accountability.
- **Balance between judicial independence and accountability is essential for credibility.**
- **Technology, ADR, and diversity** are the future pillars of a citizen-centric judiciary.

29. Overhauling India's Vocational Education and Training (VET) System – A Pathway to Viksit Bharat

Relevance to UPSC

Prelims: Education schemes, NEP 2020, ITIs, Skill Development, Public–Private Partnerships, Sector Skill Councils. **Mains**: GS2: Issues related to education, government policies, social justice (skill development, employability). GS3: Employment, demographic dividend, economic growth, human resource development.

Summary of the Article

- The **PM's Independence Day address (2025) emphasized demand-driven growth, GST reforms, and skill development as key to productivity.**
- Despite a large demographic advantage, India has a low-skilled workforce, making vocational education critical for employability.

Current VET Landscape in India:

- 14,000 ITIs with 25 lakh sanctioned seats, but only 48% seat utilization (12 lakh enrolment in 2022).
- **Low employment outcomes** – only 63% ITI graduates employed (2018), compared to 80–90% in Germany, Singapore, Canada.
- Formally **trained workforce only 4% in India (much lower than global benchmarks).**

Challenges in India's VET System:

- **Late integration** – introduced post high-school, limiting exposure.
- **No academic progression** – no credit transfers or higher education pathways.
- **Poor perception & quality –** outdated curricula, 1/3rd instructor posts vacant, weak ITI grading.
- **Weak PPPs** – limited industry involvement, MSMEs poorly engaged, weak Sector Skill Councils.
- **Low funding** – only 3% of education budget spent on VET (vs. 10–13% in Germany/Singapore/Canada).

Learning from Global Best Practices:

- **Germany** – Dual system (school + apprenticeships).
- **Singapore** – Academic progression via technical & polytechnic pathways; SkillsFuture Programme for lifelong learning.
- **Canada** – Strong PPPs; shared costs between govt. and employers.
- **Common features** – Early integration, industry-led curricula, strong instructor quality, continuous audits, PPP-driven funding.

Reforms Needed in India:

- **Early integration of VET (NEP 2020 recommendations at school level).**
- Pathways to higher education (fast-track National Credit Framework).
- **Improve quality** – industry-aligned curricula, expand NSTIs, fill vacancies, regular ITI grading, feedback systems.
- **Strengthen PPPs** – involve MSMEs, CSR funding, private partners.
- **Increase funding** – link funding to performance, provide revenue autonomy to ITIs.

Recent Schemes:

- **Employment Linked Incentive (ELI):** Encourages formal jobs but lacks skilling component.
- **PM Internship Scheme:** One-year placements, but no pathways to permanent jobs.
- **ITI Upgradation Scheme:** Modernises ITIs but doesn't ensure training quality.

Analytical Insights for Mains

- **India's demographic dividend risks becoming a liability without skilled manpower.**
- Systemic overhaul, not piecemeal schemes, is required for employability and productivity.
- **Linking VET with formal jobs, lifelong learning, and upward mobility is crucial for Viksit Bharat @2047.**
- Building **an industry-linked, aspirational, and dynamic VET ecosystem** will ensure globally competitive skills for India's youth.

30. Harnessing India's Nuclear Energy Growth

Relevance to UPSC

Mains (GS2 & GS3): Infrastructure, Energy security, Technology, Environment, Climate change, International relations

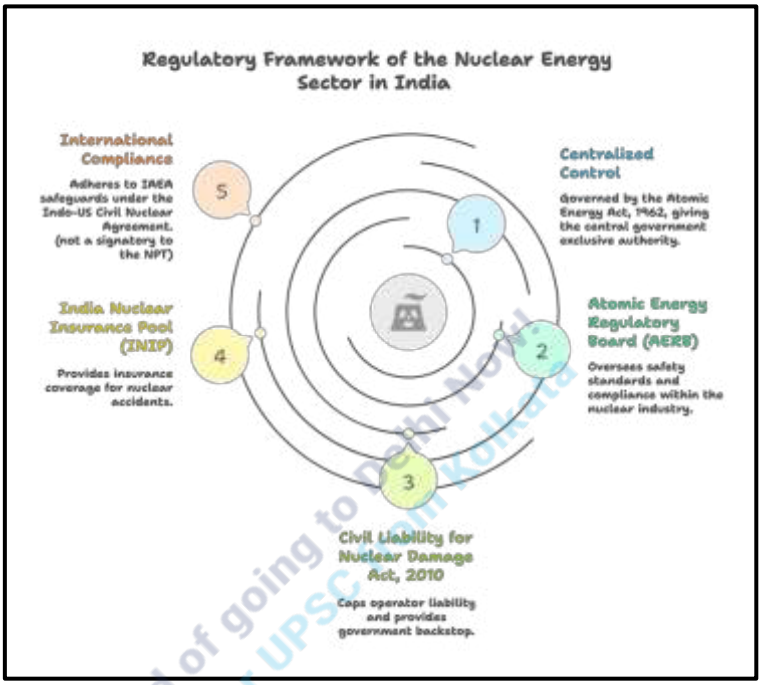
Summary of the Article

- The Government of India plans to open up **the nuclear energy sector to private players for the first time, aiming to scale up nuclear capacity to 100,000 MW by 2047.**
- **Nuclear energy is central to India's net-zero 2070 goal**, reducing fossil fuel dependency and ensuring 24/7 power reliability unlike solar/wind.
- India's nuclear power capacity will expand from 8,180 MW to 22,480 MW by 2031-32, supported by Rs. 20,000 crore allocation in Union Budget 2025-26.
- Nuclear power supports **sustainable urbanization, industrialization, job creation, and R&D (**e.g., Fast Breeder Reactors, thorium cycle).
- International collaborations (e.g., 2008 **US-India Civil Nuclear Agreement, Kudankulam with Russia**) enhance technology transfer, energy security, and diplomacy.
- **Challenges include**: uranium shortages, thorium bottlenecks, financial/regulatory barriers, skilled workforce shortage, waste management, and public distrust due to safety concerns.
- **Reforms proposed**: private participation, uranium exploration, nuclear fuel reserves, regulatory reform, workforce training, AI & digital twin adoption, centralized waste management, public awareness campaigns, and a "Thorium Valley" innovation hub.

Analytical Insights for Mains

1. Contribution to Economic Growth & Sustainability Goals

- **Energy Security**: Stable base-load power complements renewables.
- **Industrial Growth**: Meets rising demand of steel, manufacturing, urban infrastructure.
- **Climate Goals**: Crucial for net-zero 2070; aligns with SDG 7 (Affordable and Clean Energy).
- **Job Creation**: Nuclear industry provides 25% more employment per unit of electricity than wind, with higher wages.
- **Innovation Driver**: Advances in Fast Breeder Reactors & thorium-based technologies.



2. Challenges

- **Uranium supply shortage** → dependence on imports (Australia, Kazakhstan, Canada).
- **Thorium utilization lag due to bottlenecks in Fast Breeder Reactors & ADSS.**
- **Financial & regulatory hurdles** → high capital costs, liability laws deter investment.
- **Skilled workforce gap** → limited intake at BARC, brain drain to foreign programs.
- **Waste management & safety concerns** → lack of centralized repository, public distrust.

3. Measures to Accelerate Growth

- **Policy Reforms**: Amend Atomic Energy Act, 1962 for private sector participation.
- **Fuel Security**: Strategic uranium reserves; boost exploration in Jharkhand (Jaduguda mines).
- **Regulatory Simplification**: Single-window clearance; independent National Nuclear Energy Authority (NNEA).
- **Capacity Building**: Skill India + BARC collaboration; IAEA-linked programs.
- **Technology Adoption**: AI, digital twins (trialed at Tarapur Atomic Power Station).
- **Waste Management**: Centralized facility; emulate Finland's Onkalo repository.
- **Public Engagement**: Transparency in safety data, local incentives.
- **Thorium Valley Model**: R&D hub in Kerala/Andhra for thorium cycle innovation.

31. India's Path to Manufacturing Excellence

Relevance to UPSC

Mains (GS-3): Indian Economy – growth & development, employment, investment models, infrastructure, industrial policy, labour reforms, logistics, global trade competitiveness.

Summary of the Article

India's manufacturing sector stands at a decisive juncture, with record FDI inflows, strong policy initiatives (Make in India, PLI), and digital transformation reshaping growth prospects. Exports are diversifying, and emerging sectors like semiconductors, renewable energy, and medical devices are gaining momentum. However, **structural bottlenecks—land acquisition delays, incomplete labour reforms, infrastructure gaps, skill mismatches, supply chain dependence, and environmental compliance challenges—continue to impede efficiency**. Moreover, US tariffs on Indian exports threaten competitiveness in labour-intensive sectors. To achieve Viksit Bharat 2047, India must

accelerate factor market reforms, build resilient supply chains, and create a skilled workforce aligned with Industry 4.0.

Key Recent Developments Shaping Manufacturing

- **Surge in FDI:**
  - USD 165.1 billion FDI in manufacturing, a 69% rise over the last decade.
  - Rs. 33.58 lakh crore (US$ 383.5 billion) FDI inflows in the last 5 years.
- **Government Initiatives:**
  - **Make in India and PLI Scheme** attracting global giants like Apple.
  - Smartphone exports up 42% in FY24 to Rs. 1.36 lakh crore.
- **Digital Transformation (Industry 4.0):**
  - Increasing adoption **of AI, IoT, robotics**.
  - PMI at 58.2 (April 2025) indicates strong growth.
- **Exports & Market Diversification:**
  - Total exports at USD 820.93 billion in FY25.
  - Merchandise exports (excl. petroleum) hit USD 374.1 billion (6% growth).
- **Emerging Sunrise Sectors:**
  - Growth in **semiconductors, renewable energy, medical devices.**
  - Semiconductor market projected at USD 63 billion by 2026 under Semicon India (Rs. 76,000 crore).

Key Issues in India's Manufacturing

- **Land Acquisition Bottlenecks**: Fragmented land records, unclear titles, lack of political consensus (e.g., Hyderabad PharmaCity dispute).
- **Delayed Labour Reforms**: Incomplete implementation of 4 labour codes; states lagging in rule notification.
- **Infrastructure & Logistics Challenges:**
  - Logistics costs at 7.8–8.9% of GDP (improved but still above 8% global benchmark).
  - Adds 20–30% to manufacturing costs, weaker than Vietnam.
- **Skilled Labour Shortage**: Only 4.1% of workforce has formal technical training vs 70% in Germany/South Korea.
- **Environmental Compliance Costs**: Stricter norms affecting textiles, chemicals, cement (e.g., Ludhiana dyeing unit shutdowns).
- **Supply Chain Dependence on Imports**: 60–75% of electronic components imported, exposing industry to global shocks.
- **US Tariffs on Exports**: 70% of India's exports to the US (~$60.85 bn) exposed to 50% tariffs, hitting textiles & apparel.

Measures to Enhance Effectiveness of Manufacturing

- **Optimising Land Acquisition:**
  - **National Industrial Land Bank 2.0 (GIS + blockchain).**
  - Plug-and-play industrial corridors and single-window clearance.
- **Streamlining Labour Regulations:**
  - **Centre**–State coordination mechanism.
  - Reform-linked fiscal incentives for states.
  - Unified Labour Compliance Portal to curb inspector raj.
- **Enhancing Logistics:**
  - **National Integrated Logistics Grid under PM Gati Shakti.**
  - AI-enabled route optimisation, smart warehousing.
- **Building Future-Ready Workforce:**
  - **National Manufacturing Skills Mission (robotics, EVs, green hydrogen).**
  - Dual apprenticeship models and public–private skilling academies.
- **Integrating Sustainability:**
  - Green Technology Parks with shared facilities.
  - Green Credit System to reward circular economy adoption.
- **Strengthening Supply Chains:**
  - Domestic ecosystems in electronics, semiconductors, pharma.
  - Backward integration incentives and strategic reserves.
- **Diversifying Market Access:**
  - FTAs with EU, ASEAN, Africa.
  - Export hubs + global quality certifications.
- **Digital Public Infrastructure for Manufacturing:**
  - Similar to UPI in finance, create digital stack for supply chain traceability, compliance monitoring.

Analytical Insights for Mains

- India's manufacturing push requires holistic reforms in land, labour, logistics, skills, and sustainability.
- The **3Ms framework – Money (land & finance), Materials (supply chains), and Manpower (labour & skills) – is key to success.**
- Window of opportunity: global supply chain realignment post-COVID and India's demographic dividend.
- **Risks**: protectionism (US tariffs), skill mismatch, infrastructure deficits.
- **Opportunity**: PLI, digital transformation, Industry 4.0 adoption can make India a global hub.

32. Unlocking the Potential of India's Tourism Sector

Relevance to UPSC

Mains: GS-1 (Indian Culture, Regional Development), **GS-2 (**Governance, Schemes), **GS-3** (Economy, Employment, Infrastructure, Sustainable Development

Summary of the Article

- **Tourism as Growth Driver**:
  - In **2024, tourism contributed USD 249.3 billion to GDP and supported 46.5 million jobs.**
  - By 2035, it is expected to contribute 10.9% of GDP and nearly 64 million jobs.
  - Generated USD 28 billion in foreign exchange in 2024.

- **Regional Development & Inclusion:**
  - Schemes like **Swadesh Darshan 2.0 and PRASHAD** sanctioned 52 projects and 54 religious sites.
  - **Example**: Kamakhya Temple (Assam) under PRASHAD boosted local economy.
  - **Promotes homestays, local cuisine, handicrafts** → benefits marginalized communities.
- **Innovation & Entrepreneurship:**
  - **Rise of tech-driven startups** (AI travel planning, digital booking).
  - **Example**: Airial (AI itineraries), Vanyajivan Skill Academy (Tadoba) for eco-tourism.
  - **Dekho Apna Desh** webinars introduced virtual tourism.
- **Soft Power & Diplomacy:**
  - Tourism enhances India's cultural image & people-to-people ties.
  - **Mahakumbh 2025 drew 600 million pilgrims (domestic + foreign).**
  - G20 Tourism Working Group (2023) showcased cultural diversity.
  - Top source countries: **US, Bangladesh, UK, Australia, Canada, Malaysia, Sri Lanka, Germany, France.**
- **Traditional Arts & Culinary Heritage:**
  - **Examples:** Mumbai Khau Gallis, South Indian Filter Coffee Trail.
  - Promotes artisans, culinary experts, and local cultural preservation.
- **Medical & Wellness Tourism:**
  - Heal in India initiative integrates Ayurveda, Yoga, wellness + modern medicine.
  - **Medical + Ayush visas simplified.**
  - Industry valued at USD 19.4 bn (2024), projected USD 29.8 bn by 2031.
- **Tourism & SDGs:**
  - Links with **poverty alleviation, gender equality, sustainable communities, environment**.
  - **Initiatives**: National Strategy for Sustainable Tourism, SAATHI scheme.
  - **Example**: Jibhi Valley (HP) → community-based homestays & guided tours.

Main Challenges

- **Inadequate Infrastructure:**
  - Poor roads, sanitation, electricity in Odisha, North-East, Himalayan circuits.
  - **41% stakeholders cite infrastructure gaps as main barrier.**
- **Over-tourism & Environmental Strain:**
  - Destinations like **Shimla, Manali, Joshimath, Coorg, Wayanad** face resource depletion & ecosystem stress.
  - Implementation of sustainable strategies inconsistent.
- **Shortage of Skilled Workforce:**
  - Hospitality employs 37 million, but only 1% are trained.
  - Low wages + fragmented training reduce service quality.
- **Weak Branding & Visibility:**
  - Incredible India campaign impact faded.
  - Lack of global-level digital marketing & unified branding.
  - Competitors (**Saudi Arabia, Georgia, Azerbaijan, Kazakhstan**) surged with aggressive marketing.
- **Regulatory & Business Hurdles:**
  - Bureaucratic delays, complex permits, tax policies hinder tourism startups.
  - India accounts for only 1.5% of global tourist arrivals.
- **Cultural Dilution & Community Displacement:**
  - Tourism commercialization alters local traditions, raises real estate costs in Goa, Himalayas, displacing locals.
- **Safety & Security Issues:**

- Incidents like Pahalgam attack undermine tourist confidence.

Measures to Strengthen Tourism

- **Infrastructure & Connectivity:**
  - Promote PPPs like **Kerala Tourism Infrastructure Ltd. (KTIL).**
  - Improve roads, airports, sanitation, tourist police deployment.
  - Inclusion of **tourism in Master List of Infrastructure to boost investments.**
- **World-Class Destinations:**
  - Develop 50 global-standard tourist destinations.
  - **Shift focus from "places to see" → "places to experience".**
- **Simplified E-Visas & Immigration:**
  - Streamline entry, reduce queues, faster visa processing.
- **Destination Management with Carrying Capacity:**
  - Prevent over-tourism via timed entry, zoning, ticket limits.
- **Digital & Marketing Push:**
  - Use AI, influencers, social media, real-time data.
  - **Upgrade Dekho Apna Desh into a national movement.**
- **Skilled Workforce Development:**
  - Optimize **Hunar Se Rozgar Tak with modules on responsible tourism**, cultural sensitivity, green practices.
  - Partnerships with IHMs & private platforms.
- **Sustainable Coastal & Island Tourism:**
  - Focus on coral reef protection, plastic-free zones, zero-waste tourism.
  - Integrate with Blue Economy framework.
  - Adopt eco-tourism codes, green transport (e-boats) in Andaman & Lakshadweep.

Analytical Insights for Mains

- **Tourism is a multi-sector growth engine** → integrates service economy, employment, culture, and environment.
- **Balanced regional development through tourism** can reduce urban migration pressure.
- **Medical + wellness tourism** can position India as a global healthcare hub.
- **Aggressive digital branding** + simplified visas are crucial for competing with emerging tourist destinations.
- **Carrying capacity & sustainability** must guide future tourism to avoid over-exploitation of fragile ecosystems.
- **Acts as a pillar of soft power**, strengthening cultural diplomacy & India's global image.

33. India's Logistics Transformation for a Sustainable Future

Relevance to UPSC

Mains (GS-3): Infrastructure, Investment models (PPP), Transport & logistics, E-commerce, Employment, Sustainability & Climate Action, Agricultural supply chain, Skill development, Governance reforms.

Summary of the Article

- India's logistics sector is undergoing rapid transformation from **being cost-heavy, fragmented, and inefficient to becoming a potential backbone of trade and mobility.**
- Government reforms like **PM Gati Shakti National Master Plan, GST, and logistics parks** are reshaping supply chains by enhancing efficiency and reducing costs.
- Infrastructure expansion through **Dedicated Freight Corridors (DFC), industrial corridors, and multimodal logistics parks is reinforcing connectivity.**

- The e-commerce boom is driving last-mile delivery expansion into Tier-2/3 cities, with the last-mile market projected at USD 10.55 billion by 2032.
- **Digital transformation using AI, IoT, robotics, blockchain, and predictive analytics** is improving transparency, efficiency, and competitiveness.
- **3PL & 4PL services are expanding, offering end-to-end solutions**, while the formalisation drive is skilling the workforce and expanding organized players' market share.
- Sustainability initiatives like **EV adoption, ethanol blending, coastal shipping, and green corridors** align logistics with India's climate commitments.

Analytical Insights for Mains

1. Strengths in Transformation

- **PM Gati Shakti & Bharatmala** provide integrated, multimodal transport solutions.
- **Dedicated Freight Corridors improve freight efficiency** (1,000 km completed in FY 2023–24).
- Digital adoption (AI-powered fleet, blockchain, warehouse automation) reduces inefficiencies.
- **Workforce skilling & Employee Linked Incentives (ELI) schemes** create employment opportunities.
- Green logistics push through EVs, zero-emission truck corridors, and sustainable shipping practices.

2. Persistent Challenges

- **High logistics cost** (7.8–8.9% of GDP) still above global average, reducing competitiveness.
- **Infrastructure bottlenecks** – port congestion, poor road/rail integration, project delays.
- **Regulatory fragmentation** – multiple ministries and compliance burdens inflate costs.
- **Multimodal imbalance** – roads handle 70% freight vs. inland waterways (2%).
- **Skill gap & informality** – 90% of the sector unorganised, low productivity, unsafe conditions.
- **Cold chain deficit** – 40–50% agri-produce lost annually due to lack of cold storage & supply chain leaks.

3. Way Forward / Reforms Required

- Streamline regulatory approvals with a single-window clearance system.
- **Accelerate multimodal projects (DFC, MMLPs, industrial corridors) with robust KPIs.**
- Promote **private sector participation (PPP) in ports & logistics parks (target >75% share by 2030).**
- **Adopt advanced tech** (blockchain, digital twins, AI-based demand forecasting).
- Skill mission for **logistics workforce, including green skills for sustainable practices.**
- Formalise unorganised logistics operators through finance access, ONDC integration, and simplified GST.
- **Strengthen agri-cold chain using solar-powered pack houses, reefer trucks, and FPO-led models.**
- Pursue logistics diplomacy (IMEC, INSTC, BIMSTEC) to strengthen supply chain resilience and geo-strategic influence.

Conclusion

India's logistics sector can emerge as **a driver of sustainable and competitive growth by embracing technology, multimodal integration, skilling, and green mobility**. With effective reforms and decisive execution, logistics can shift from being a bottleneck to a backbone for Viksit Bharat@2047 and net-zero 2070 commitments, contributing to SDG 8 (Decent Work), SDG 9 (Infrastructure & Innovation), and SDG 13 (Climate Action).

34. Building a Stronger Education System in India

Relevance to UPSC

Mains: GS2: Issues relating to development and management of social sector/services relating to education. GS3: Skill development, employment, innovation, and public-private partnerships.

Summary of the Article

India's education system, with 26% of the population aged 0-14 years, presents huge opportunities. **Reforms like NEP 2020, Skill India, and NIPUN Bharat Mission** have brought progress, yet dropouts, unequal access, funding gaps, rote learning, and teacher shortages persist.

Key Developments:

- **Digital & Online Education**: Growth of EdTech, PM eVidya, Amazon's coding initiative, AI Centre of Excellence (₹500 cr), online education CAGR ~20%.
- **Vocational & Skill Education**: NEP 2020 focus; Skill India with 30+ lakh enrolments in 2024.
- **Early Education Reform**: FLN Mission, NIPUN Bharat (universal literacy & numeracy by 2026-27), Navchetna, Poshan Bhi Padhai Bhi.
- **Research & Innovation**: Atal Innovation Mission, 10,000 Atal Tinkering Labs, India's GII rank improved from 76 (2014) to 39 (2024), ANRF established.
- **Private Investment & FDI**: 100% FDI allowed, inflows of USD 9.90 bn (2000–2024), market projected USD 225 bn by FY25.
- **Multilingualism**: NEP 2020 push, AICTE's e-KUMBH for Bharatiya languages.
- **Teacher Training**: NEP's 4-year B.Ed., NISHTHA trained 42 lakh teachers, DIKSHA platform penetration in rural India (70%).
- **Higher Education Governance**: HECI for autonomy, global expansion of IITs (Zanzibar, Abu Dhabi), India 4th largest in Times Higher Ed rankings.

Major Issues:

- **High Dropout Rates**: 7.9% (age 15–16) in 2024, higher among girls.
- **Unequal Access**: Rural literacy 77.5% vs urban 88.9%.
- **Funding Shortfall**: Only 3–4% of GDP vs NEP's target of 6%.
- **Rote Learning**: 76% Class 3 cannot read Class 2 text; 66% struggle in math.
- **Digital Divide:** Only 18.47% rural schools have internet vs 47.29% in urban areas.
- **Public-Private Divide**: 67.5% of universities are private, fees high → inequality.
- **Teacher Shortages**: 10 lakh vacancies; deficit of 1 million teachers.
- **Skill Gap**: Youth = 83% of unemployed workforce, employability crisis.
- **PwD Challenges**: Literacy rate only 52.2% among disabled (NSS 76th round).
- **Corruption**: Fake universities (20+ identified by UGC in 2023), ghost schools.

Measures to Transform:

- **Infrastructure Development**: Electricity, toilets, classrooms, digital tools in rural schools.
- **Technology Access**: Expand BharatNet, PM e-Vidya, PPP for low-cost digital devices.
- **Vocational Expansion**: Align with industry needs, certification, rural focus.
- **Teacher Training**: AI-driven DIKSHA modules, professional development, competency-based pedagogy.
- **Competency-Based Education**: Implement NCF 2023, PARAKH, shift from rote to problem-solving.
- **Women's Education**: Expand KGBVs, Beti Bachao Beti Padhao, scholarships in STEM.
- **Public-Private Collaboration**: Curriculum design, technology, teacher training.

- **Increase Public Spending**: Raise to 6% of GDP, performance-based funding, CSR for education.
- **Inclusive Education for PwDs**: Infrastructure upgrades, specialized teacher training, NGO partnerships.

Analytical Insights for Mains

- **Education as a Demographic Dividend**: With 26% population below 14 years, investment in education is critical to harness demographic advantage.
- **NEP 2020 Implementation Gap**: While visionary, success depends on funding, state cooperation, and reducing inequalities.
- **Digital Divide as a Structural Barrier**: Without equitable access, technology may worsen inequalities instead of bridging them.
- **Employability Challenge**: Curriculum-industry mismatch is a major cause of educated unemployment.
- **Gender & Social Equity**: Strengthening women's education and addressing rural-urban disparities are essential for inclusive growth.
- **Governance Reforms**: HECI and global IIT campuses symbolize India's aspiration for global educational leadership.
- **Corruption & Fake Institutions**: Unless governance is tightened, credibility of Indian education remains at risk.

35. US Tariffs on Indian Exports: Challenges and Opportunities for Diversification

Relevance to UPSC

Mains (GS2 & GS3): GS2: Bilateral Relations (India–US), International Trade Policy, **GS3:** Indian Economy – External Sector, Employment, Trade Reforms

Summary of the Article

- The US has imposed steep 50% tariffs on Indian exports (effective August 27), impacting **key labour-intensive sectors like textiles, gems & jewellery, shrimps, furniture, and carpets.**
- India's export dependence on the US (18% of exports in 2024, up from 11% in 2010) has made it vulnerable. By contrast, China reduced its reliance on the US (from 20% to 14% in the same period).
- The **tariffs make Indian goods uncompetitive while competitors such as Vietnam, Bangladesh, and Cambodia are expected to gain.**
- Although exports to the US form less than 2% of India's GDP, the employment impact is disproportionately large since affected sectors are labour-intensive (**SME hubs like Tirupur, Surat, Noida already facing shutdowns).**
- The development has triggered a debate on trade diversification, reforms, and multilateral trade bloc participation.

Analytical Insights for Mains

- **Impact of US Tariffs:**
  - **Loss of cost competitiveness** → reduced demand and production halts.
  - **High employment risk due to labour-intensive nature of affected industries.**
  - Geopolitical leverage of the US increases as India's dependence deepens.
- **Policy Challenges & Reform Space:**
  - Diversification imperative: **Africa, Latin America, Southeast Asia, and Europe offer opportunities.**
  - **Multilateral trade deals**: India may reconsider joining frameworks like CPTPP, where Japan, Australia, and ASEAN are supportive.
  - **Reframing India–US negotiations**: Highlighting that the US actually enjoys a $40 billion overall surplus with India (services, royalties, defence).

- **Domestic cushioning**: Possible government relief through cheaper credit, procurement by PSUs, and Indian Railways support.

- **Opportunities Emerging from the Crisis:**
  - **Trade reform momentum**: Lowering tariffs on intermediate goods to improve competitiveness.
  - **Multilateral leverage**: India better positioned for trade deals than during RCEP talks.
  - **Diversification push:** Beyond US, stronger presence in Europe, Africa, Latin America, plus expansion in digital services & high-value manufacturing.

36. The Gender Angle to India's Economic Vulnerabilities

Relevance to UPSC

Prelims: Indian Economy, Female Labour Force Participation Rate (FLFPR), Employment Schemes, International Trade and Tariffs.

Mains (GS2 & GS3): Issues relating to women empowerment, Inclusive growth and employment, Demographic dividend, External sector vulnerabilities, Structural reforms for economic growth.

Summary of the Article

- India's economic ascent to a $4.19 trillion economy is at risk due to U.S. proposed 50% tariffs on $40 billion of Indian exports, potentially shaving 1% off GDP.
- The **impact will be gendered, as labour-intensive export sectors like textiles, gems, leather, and footwear employ a high proportion of women.**
- India's vulnerability stems from its export dependence on the U.S. (18%) and its low female labour force participation (37–41.7%), far below China's 60% and the global average.
- IMF estimates closing the gender gap could boost India's GDP by 27%.
- **Demographic dividend risks turning into a demographic burden by 2045 if women remain excluded from productive work.**
- Rural women's participation is rising, but mostly in unpaid, low-productivity roles, while urban participation stagnates due to safety, mobility, and care burden issues.
- Global lessons show that **structural reforms in childcare, legal protections, and flexible work can integrate women into the workforce.**
- Indian examples like **Karnataka's Shakti scheme (free bus travel for women, +40% ridership), Urban Company (15,000+ women employed with social security), and Rajasthan's Indira Gandhi Urban Employment Guarantee Scheme (65% women workforce) highlight positive models.**

Analytical Insights for Mains

1. External Shocks and Gendered Crisis

- **Tariff shocks on labour-intensive exports affect women disproportionately,** exposing the gender bias in India's growth model.
- Unlike China's diversified base, India's narrow manufacturing base heightens vulnerability.

2. FLFPR as a Strategic Necessity

- India's low female labour participation limits its growth potential despite a large working-age population.
- **Safety, mobility, sanitation, and unpaid care work are structural barriers.**

3. Demographic Dividend at Risk

- India's window closes by 2045, but without integrating women, it risks an Italy/Greece-like stagnation.
- **Female employment is the key to harnessing demographic advantage.**

4. Global Lessons for India

- **U.S. wartime policies**: childcare + equal pay boosted participation.
- **China's reforms:** education + care infrastructure raised FLFPR to 60%.
- **Japan & Netherlands**: Flexible, supportive work structures raised women's participation and GDP.

5. Way Forward for India

- **Move beyond populism and welfare** → structural reforms in legal protection, skill-building, and care economy.
- **Scale up successful state models** (Karnataka, Rajasthan) nationwide.
- **View women as active economic agents**, not passive beneficiaries.

37. Regulating India's Online Gaming Industry

Relevance to UPSC

Mains: GS2 (Government policies & regulation, governance issues, role of state & regulatory bodies), **GS3** (Economy: Start-ups, FDI, Emerging technologies, Cybersecurity, Money laundering, Digital economy).

Summary of the Article

The **Promotion and Regulation of Online Gaming Bill, 2025 seeks to curb concerns like gaming addiction, mental health risks, and financial losses but faces criticism due to a blanket ban on money gaming**. With India's digital economy booming, a regulatory approach is seen as more effective than prohibition. The article discusses drivers of growth, current regulation, challenges, and measures needed to strengthen India's gaming industry.

Factors Driving Growth of India's Gaming Industry

- **Technological Enablers:**
  - High-speed Internet access via **BharatNet & National Broadband Mission**; 5G rollout improving latency.
  - **Affordable smartphones & cheap data**: 85% households own smartphones, mobile gaming contributes 90% of the market.
  - **AR/VR, blockchain, and cloud gaming** integration enhancing experiences.
- **Policy & Cultural Shifts:**
  - **Government support**: IT Rules 2021, AVGC Task Force, Content Creators Award, Create in India campaign.
  - **Covid-19 adoption**: Gaming time rose from 2.5 hrs/day to 4.1 hrs/day, industry grew 50%.
  - E-**sports recognition**: Included in Asian Games & Commonwealth Games, growth of tournaments like DreamHack Hyderabad 2024.
- **Economic Drivers:**
  - **Start-up ecosystem**: Unicorns like Dream11, Games24x7, MPL; raised USD 2.8 billion in funding.
  - **FDI inflows**: 100% FDI allowed; NVIDIA launching cloud gaming service in India (2025).

Regulation of the Gaming Industry

- **IT Act, 2000 & Rules (2021, amended 2023):** Registration with Self-Regulatory Bodies (SRBs), power under Sec 69A to block illegal sites.
- **Bharatiya Nyaya Sanhita 2023:** Sec 111 & 112 penalise cybercrimes, betting & gambling (1–7 years imprisonment).
- **GST Act, 2017:** Offshore/illegal gaming under IGST, Simplified Registration Scheme for platforms.
- **Consumer Protection Act, 2019:** Ban on misleading/surrogate ads, CCPA action against celebrity endorsements.

Concerns in the Gaming Industry

- **Regulatory Ambiguity**: Different state laws (Telangana ban, AP gambling ban, TN ban on Poker/Rummy). No clear skill vs. chance distinction.

- **Illegal gambling & money laundering**: Offshore markets valued at USD 350B (betting) & USD 1.7T (gambling); risk to national security.
- **Addiction**: 23% youth face stress; 87% students play regularly; "chasing losses" causes distress, even suicides.
- **Cyberattacks**: 11 million accounts breached (2024); risks of identity theft & fraud.
- **Financial risks**: ₹20,000 crore lost annually; minors overspending (₹17 lakh PUBG case).
- **Taxation burden:** 28% GST on face value of bets risks killing startups & innovation.

Measures Needed for Strengthening the Industry

- **Comprehensive Regulation**: Central regulatory body (UK model), age-gating, spending limits, self-exclusion tools, mental health integration.
- **Whitelist of operators**: Only compliant platforms allowed; blocks illegal sites via ISPs & payment gateways.
- **Curbing Illegal Gambling & AML Compliance**: Real-time monitoring with banks & payment providers; international cooperation.
- **Cybersecurity**: Encryption, multi-factor authentication, audits, GDPR-style data protection.
- **Gaming Hubs & Incubators**: Dedicated centres like Montreal, Singapore, South Korea to boost talent & innovation.

Analytical Insights for Mains

- **Ban vs Regulation Debate**: Blanket bans drive gaming underground → regulation ensures transparency & tax compliance.
- **Economic Potential**: India's gaming market projected at USD 8.6B by 2028 (CAGR 27.4%), can generate jobs, startups, FDI inflows.
- **Governance Lens**: Regulation ensures consumer safety, financial transparency, cybersecurity, aligning with Digital India.
- **Ethical Dimension**: Need for responsible gaming, balancing innovation with social safeguards.
- **Way Forward**: Framework based on GAME – Governance, Awareness, Monitoring, Engagement.

38. The ASI is Facing a Credibility Crisis

Relevance to UPSC

Mains (GS1 - History & Culture, GS2 - Governance): Role of ASI, politicisation of history, challenges of institutions, need for reform in archaeology.

Summary of the Article

- Archaeology in India is increasingly contested, with narratives shaped by politics as much as by evidence.
- The **Keeladi excavations (Tamil Nadu, 2014)** revealed over 7,500 artefacts, pointing to a literate, urban, and secular Dravidian society during the Early Historic period (6th–4th BCE).
- Findings challenged the **Gangetic-centric narrative of India's second urbanisation, bridging the Iron Age–Early Historic gap.**
- In 2017, the lead archaeologist was abruptly transferred and the ASI dismissed the site's significance, raising suspicion of political interference.
- The **Madras High Court transferred the project to the Tamil Nadu State Archaeology Department, which later unearthed 18,000 artefacts, strengthening claims of Dravidian antiquity.**
- The ASI has shown selective rigour—delaying publication of results from Adichanallur (Iron Age site, 2004 rediscovery) while promoting mytho-historical narratives without hesitation.

- **Institutional weaknesses: arbitrary personnel transfers, outdated methods** (Wheeler system), poor peer-reviewed publications, and lack of transparency.
- Compared to global institutions (e.g., **Deutsches Archäologisches Institut, Germany**), ASI remains insular and disconnected from international scholarship.

Analytical Insights for Mains

1. Crisis of Credibility:

- The ASI's actions in **Keeladi and Adichanallur reflect methodological nationalism**—prioritising state-sanctioned narratives over evidence-based inquiry.
- This undermines scientific rigour and damages institutional trust.

2. Politicisation of Archaeology:

- **Archaeology becomes a political battlefield**, where findings that support plural regional histories (e.g., Dravidian antiquity) face resistance.
- Findings aligned with nationalist or mythological narratives are promoted readily.

3. Institutional Deficiencies:

- Bureaucratic control undermines autonomy.
- **Lack of peer review and global collaboration** isolates Indian archaeology.
- Outdated excavation techniques hinder methodological innovation.

4. Way Forward:

- Structural reforms ensuring autonomy from political interference.
- **Modernisation of methods (advanced dating techniques, GIS-based mapping).**
- Transparency in publishing with peer-reviewed, internationally accessible research.
- **Adoption of a plural epistemic framework,** recognising India's regional diversities in history.

39. The ECI's Ring Fence is the Constitution and the Law

Relevance to UPSC

Mains (GS II): Role of constitutional bodies (ECI), Issues in electoral reforms, transparency, and credibility, Judicial interventions in electoral processes

Summary of the Article

- **Free and fair elections are part of the "basic structure" of the Constitution**. Recent controversies have raised questions about the neutrality of the Election Commission of India (ECI).
- **Opposition's allegations (Aug 7, 2025):** Irregularities in voter rolls in Bangalore (duplicate voters, fictitious names, "xyz" placeholders, zero house numbers). If true, these raise serious doubts about electoral integrity.
- **ECI's response (Aug 17, 2025):** Instead of addressing irregularities, the CEC demanded an affidavit/apology from Rahul Gandhi. This adversarial posture undermines its role as a neutral constitutional umpire.
- **Legal context:** The Representation of the People Act, 1950 provides for annual revision and public scrutiny of rolls. However, systemic loopholes allow manipulation. The ECI's role is not just procedural compliance but ensuring substantive fairness.
- **Bihar Special Intensive Revision (SIR):** The ECI undertook a category not recognised in law, with a July 1 qualifying date (instead of January 1), leading to deletion of 65 lakh voters. SC intervened, ordering publication of deleted names – a step towards transparency.
- **Judicial caution:** Justice Fazal Ali (A.C. Jose vs. Sivan Pillai, 1984) warned against politically compromised ECI leading to 'political havoc' and constitutional crisis.

- Overall, the ECI's credibility is at risk due to politicised responses, legal overreach, and procedural shortcuts. Its constitutional "ring fence" lies in neutrality, transparency, and adherence to law.

Analytical Insights for Mains

1. Constitutional Mandate:

- **Article 324 grants wide powers but also imposes responsibility to safeguard democracy.**
- Free and fair elections form part of the basic structure, hence any compromise is unconstitutional.

2. ECI's Neutrality at Stake:

- By acting like a political actor (demanding apology/affidavit), the ECI risks eroding public trust.
- **Neutrality is central to its legitimacy.**

3. Electoral Roll Manipulations:

- Multiple/fictitious entries compromise the integrity of electoral democracy.
- Mechanisms under the **RPA, 1950 exist but implementation loopholes remain.**

4. Judicial Oversight:

- SC intervention in Bihar SIR underscores the importance of judicial checks on ECI's overreach.
- **Past judgments (A.C. Jose case) show the judiciary's concern for ECI accountability.**

5. Way Forward:

- Strengthen independent oversight of electoral rolls.
- **Ensure legal adherence (no ad-hoc categories like SIR).**
- Promote institutional reforms to secure ECI's independence from executive/political influence.

PRELIMS BOOSTER & PIB COMPILATION (THE HINDU & INDIAN EXPRESS)

1 AUGUST

1. Schengen Visa

A Schengen visa **allows non-EU nationals to visit 29 European countries without internal border checks**. It permits stays of up to 90 days within a 180-day period, for purposes like **tourism, business, or medical visits**. Work is not permitted under this visa. **25 EU countries** (excluding Cyprus and Ireland) and 4 EFTA members (**Iceland, Liechtenstein, Norway, Switzerland**) issue it. The Cascade Visa Scheme offers longer multi-entry visas to Indian travellers with a good visa history. 2-year visa after two prior Schengen visas. 5-year visa after using a 2-year multiple-entry visa.

2. Dorjilung Hydropower Project

Dorjilung Hydropower Project is a **planned 1125 MW run-of-river project in eastern Bhutan on the Kurichhu River**. It features a 139.5 m concrete-gravity dam and a 15 km headrace tunnel leading to an underground powerhouse. Annual generation is expected to be 4.5 TWh.

Estimated cost: $1.7 billion, financed by the World Bank.

In Nov 2024, **DGPC (60%) and Tata Power (40%**) signed an MoU for PPP-based joint development.

Target commissioning: Early 2032.

3. Musi River

Musi River, also known as **Muchukunda or Musunuru, is a major tributary of the Krishna River in Telangana**. Originates in Anantagiri Hills, Vikarabad; formed by Esi and Musa rivulets. **Flows eastward through Hyderabad, dividing the Old and New City**. Passes through **Rangareddy and Nalgonda districts**. Confluences with Krishna River near Wazirabad.

Total length: ~240 km.

Key dams: Himayat Sagar and Osman Sagar.

River is heavily polluted downstream.

4. Mount Cilo

Mount Cilo is located in **Hakkari Province (Turkey), southeast of Lake Van, near the Iraqi border.** It is part of the eastern Taurus mountain range and the Alpine-Himalayan Fold System.

Elevation: 4,135 meters, second highest glacial area in Turkey after Mount Ararat.

Formed by **Arabian, Anatolian, and Eurasian plate movements**. Features rugged topography with glacial valleys, limestone cliffs, and deep gorges. Five major peaks include **Uludoruk and Suppa Durek**. Climate change is accelerating glacier melt due to extreme heatwaves and drought.

5. CRIB Blood Group

CRIB is a **newly discovered blood group under the Cromer (CR) blood group system**, named to reflect its discovery in India (Bangalore). **Announced at the 35th ISBT Congress in Milan, it is the first of its kind globally**. Identified after 10 months of research and molecular testing by international experts. The Cromer system involves antigens on the decay-accelerating factor (DAF), with 12 high and 3 low-prevalence antigens. New antigens like CRIB improve transfusion safety, donor matching, and compatibility testing. **A rare blood type occurs in 0.1% of the population, complicating transfusions and organ transplants.**

5 AUGUST

1. Bio-fortified potatoes

Bio-fortified potatoes with **high iron content are being developed to combat iron deficiency and hidden hunger**. Developed by the **International Potato Centre (CIP)** using conventional breeding and biotech without altering taste or yield. **CIP is setting up a South Asia regional centre in Agra** to strengthen R&D and seed access. Iron-fortified potato variety released in Peru is under evaluation for Indian **conditions. Bio-fortified sweet potatoes rich in Vitamin A are already in Karnataka, Assam, WB, and Odisha**. ICAR has released biofortified varieties in 61 crops, including cereals, pulses, millets, and vegetables.

2. Collusive Litigation

It refers to lawsuits **where parties are not truly adversarial but cooperate to achieve a shared goal.** Such suits may manipulate the judicial process and undermine the adversarial system. **They can be used to bypass the normal legislative process**. In India, non-parties to a collusive decree can challenge it by proving collusion or fraud. **High Courts can intervene under Article 227**. Burden of proof lies on the party challenging the decree. Courts may set aside such decrees even without a specific prayer.

3. Pilibhit Tiger Reserve (PTR)

Pilibhit Tiger Reserve (PTR) is **located in Uttar Pradesh across Pilibhit, Lakhimpur Kheri, and Bahraich districts**. Lies in the Terai Arc Landscape, along the India-Nepal border in the foothills of the Himalayas. **Covers 730 sq.km., with a 602 sq.km. core zone. River Gomti originates here**, along with catchments of Sharda, Chuka, and Mala Khannot. Features dense sal forests, tall alluvial grasslands, and seasonal swamps. **Houses Sharda Sagar Dam (22 km) along its boundary.** Major fauna include tigers, swamp deer, Bengal florican, and leopards.

Known for rich avian diversity, including Swamp Francolin, Great Hornbill, and Asian Openbill.

4. HQ-16

HQ-16 is a **medium-range Surface-to-Air Missile (SAM) developed by China, based on Russia's Buk missile system**. Designed to engage aircraft, cruise missiles, helicopters, and UAVs. Uses a vertical launch system for 360° coverage in complex terrains. **Mounted on a 6x6 high mobility wheeled chassis for better mobility and maintenance**. Each launcher holds 6 missiles; missile weighs 650 kg and is 5.2 m long.

Interception range: up to 40 km for aircraft, 3.5–12 km for cruise missiles.

Guidance: inertial + semi-active radar homing in terminal phase.

5. Sea of Japan (East Sea)

The Sea of Japan (East Sea) is a marginal sea of the western Pacific, bounded by **Japan, Sakhalin (Russia), Russia, North Korea, and South Korea**. Covers 978,000 sq.km, average depth 1,667 m, and has **Dohoku Seamount as its deepest point**. Connected to surrounding seas via multiple straits like **Tsushima, La Perouse, and Tsugaru**. Almost tideless and highly oxygenated, enabling high biological productivity.

Economic activities: mining of magnetite, gas, petroleum.

Major ports: Vladivostok, Wonsan, Niigata, etc.

6 AUGUST

1. National Highways & Infrastructure Development Corporation Limited (NHIDCL)

NHIDCL is a **Central Public Sector Undertaking under the Ministry of Road Transport & Highways**. Incorporated on **18th July 2014 under the Companies Act, 2013.** It is a wholly government-owned entity. Focused on highway development in border areas to enhance regional connectivity. **Operates in J&K, Ladakh, Uttarakhand, A&N Islands, and the Northeastern Region.**

Key projects include **tunnels, logistics hubs, and cross-border link roads**.

Acts as the nodal agency for the "Act East Policy" in the Northeast.

2. RS-28 Sarmat

Russia's new-generation ICBM, also known as **"Satan II" in the West**. Named after the **ancient Sarmatian people**. Three-stage, liquid-fueled missile with a range of 18,000 km and 208-tonne launch weight.

World's heaviest ICBM; length: 35.3 m; diameter: 3 m. Carries up to 16 nuclear warheads or Avangard hypersonic glide vehicles. **Uses inertial, GLONASS & astro-inertial navigation**. Capable of fractional orbital bombardment. Warheads can be 2,000 times more powerful than Hiroshima/Nagasaki bombs.

3. Sahel Region

The Sahel is a **semi-arid transitional region in western and north-central Africa, between the Sahara Desert and humid savannas**. It stretches 5,000 km from the Atlantic Ocean to the Red Sea. **Passes through Senegal, Mauritania, Mali, Burkina Faso, Niger, Nigeria, Chad, Sudan, and Eritrea.** Vegetation includes dry grasslands, thorny shrubs, acacia, and baobab trees. Faces violent extremism, weak governance, economic issues, and climate change impacts. **A key migrant transit route to northern Africa and Europe.**

4. Assets Under Management

AUM refers to the **total market value of assets managed by a financial institution for clients**. It includes stocks, bonds, and other financial instruments. AUM is influenced by market changes, investor inflows/outflows, and dividend reinvestments. **Higher AUM signals fund popularity, stability, and expertise of the institution**. It affects fund liquidity, diversification potential, and sometimes investment fees or minimum investments. **Investors use AUM to evaluate a mutual fund's credibility and size.**

5. UN World Food Programme

UN World Food Programme (WFP) is **the world's largest humanitarian agency focused on eradicating hunger and promoting food security**. Established in 1961, **it aligns with SDG 2 to end hunger and improve nutrition**. Operates in 120+ countries, offering emergency food aid and supporting community resilience. Funded by voluntary donations from governments, corporates, and individuals. **Headquartered in Rome, Italy.** **India is a member, and WFP has been active here since 1963**. Won the Nobel Peace Prize in 2020. **Publishes the Global Report on Food Crisis.**

7 AUGUST

1. Lalit Kala Akademi

Lalit Kala Akademi was **established on 5th August 1954** as an autonomous body under the **Ministry of Culture to promote Indian visual art**. Inaugurated by **Maulana Abul Kalam Azad, it became a statutory authority in 1957** under the Societies Registration Act, 1860. **Headquartered in New Delhi, with regional centres in Chennai, Lucknow, Kolkata, Bhubaneswar, and Garhi**. Functions through General Council, Executive Board, and committees. **Organizes the National Exhibition of Art** and promotes Indian art globally through Cultural Exchange Programmes.

2. PAHAL Scheme

PAHAL (Pratyaksh Hanstantrit Labh) is a **Direct Benefit Transfer (DBT) scheme for LPG subsidies, launched by the Ministry of Petroleum and Natural Gas**. Consumers pay market price, and subsidy is directly credited to their bank account. **Covers 17+ crore LPG users, making it the world's largest cash transfer program.**

Objectives: Ensure transparency, eliminate fake connections, improve LPG delivery, and offer self-selection in subsidy.

Eligibility: LPG user with annual taxable income ≤ ₹10 lakh.

Two modes: Aadhaar-based DBT (preferred) and Non-Aadhaar-based.

3. BIMSTEC

Established on **6 June 1997 through the Bangkok Declaration**.

Comprises 7 countries: 5 from South Asia (Bangladesh, Bhutan, India, Nepal, Sri Lanka) and 2 from Southeast Asia (Myanmar, Thailand). **Aims to connect South and Southeast Asia via the Bay of Bengal region.**

Secretariat: Dhaka, Bangladesh.

Covers 14 priority areas; India leads in Transport & Communication, Tourism, Environment & Disaster Management, and Counter-Terrorism.

Represents 1.7 billion people (22% of world population), with $5 trillion GDP.

4. India Cine Hub Portal

Launched on **June 28, 2024, by the Ministry of Information & Broadcasting under NFDC**. Acts as a single-window system for film permissions, incentives, and resource mapping. **Aims to promote India as a global filming destination and create a film-friendly ecosystem**. Offers GIS-based location mapping and a common application form. **7 states & 2 UTs fully integrated; 21 states & 6 UTs onboard**. Now extended to Indian filmmakers as well.

5. INF Treaty

Signed in **1987 between the US and the Soviet Union to curb the nuclear arms race.** Aimed to eliminate ground-launched missiles with ranges between 500 to 5,500 km. Driven by rising nuclear tensions in Europe due to missile build-ups. **Leaders Reagan and Gorbachev finalized the agreement after prolonged negotiations**. 2,619 missiles dismantled within three years with mutual verification.

Current status: US withdrew, alleging Russian violations.

8 AUGUST

1. Indian Flapshell Turtle

Indian Flapshell Turtle (Lissemys punctata): Freshwater turtle found in Pakistan, India, Sri Lanka, Nepal, Bangladesh, Myanmar.

Habitat: Shallow, stagnant waters with sandy/muddy bottoms; burrows frequently.

Features: Femoral flaps, oval soft shell, up to 370 mm, lifespan ~20 years, omnivorous, drought survival 120–160 days.

Conservation: IUCN–Vulnerable, CITES–Appendix I, WPA 1972–Schedule I.

Albinism: Rare genetic condition (low melanin), recessive, 1 in 10,000 births, requires both parents to carry the gene; partial albinism = leucism.

2. Inter State Transmission System (ISTS)

Inter State Transmission System (ISTS) is a high-voltage transmission network enabling seamless electricity flow across Indian states. **Managed by Central Transmission Utility of India Limited (CTUIL)**, a subsidiary of Power Grid Corporation of India Limited (POWERGRID) under the Ministry of Power. **Operates above 132 kilovolts (kV), reducing losses and enhancing grid stability**. Connects power-surplus to power-deficit regions, supporting a unified energy market. Crucial for nationwide solar and wind power transmission. **Regional Load Dispatch Centers (RLDCs) and the National Load Dispatch Center (NLDC) regulate supply-demand balance**. Power is stepped down at state substations and distributed via State Transmission Utilities (STUs) and local grids.

3. District Flood Severity Index (DFSI)

District Flood Severity Index (DFSI) measures **historical flood severity based on affected population, flood spread, and duration.**

Parameters: mean flood duration, % area historically flooded, deaths, injuries, district population.

Developed using India Flood Inventory with Impacts (IFI-Impacts) database. **Patna ranks 1st; many Indo-Gangetic Plain and Assam districts in top ranks**. **Thiruvananthapuram tops in flooding events but not in top 30 DFSI**. Dhemaji, Kamrup, Nagaon in Assam faced 178+ flood events**.** Urban flooding worsens due to poor urban planning.

4. Yashoda AI

"Yashoda AI": AI Literacy Program for Women launched in May 2025.

Objective: Equip women with **AI literacy for digital inclusion, cybersecurity, digital privacy, and safe online practices.**

Initiative: National Commission for Women (NCW) with Future Shift Labs (FSL).

Trained ~2500 women from rural/semi-urban areas, including SHG members, local leaders, ASHA workers.

NCW: Statutory body (1992) under NCW Act, 1990; Chairperson + 5 Members + Member-Secretary; 3-year term; powers of a civil court for investigations.

5. Biochar

Biochar: Carbon-rich charcoal made from agricultural residue and organic municipal solid waste.

Production: Heating crop residue at 400–600°C in absence of oxygen.

Carbon storage: Holds carbon in soil for 100–1,000 years, acting as a long-term carbon sink.

Agriculture: **Improves water retention, restores degraded soils**, reduces nitrous oxide emissions by 30–50%.

Industries: Used in carbon capture from exhaust gases (lower efficiency than conventional methods

Construction: Low-carbon building material, stable carbon sink.

Wastewater treatment: Low-cost pollution reduction.

12 AUGUST

1. National Centre for Disease Control (NCDC)

National Centre for Disease Control (NCDC) is an institute under **the Directorate General of Health Services, Ministry of Health and Family Welfare.**

Headquarters: New Delhi, with 8 branches across India.

Origin: Began as Central Malaria Bureau (1909, Kasauli), renamed Malaria Survey of India (1927), shifted to Delhi as Malaria Institute of India (1938), became National Institute of Communicable Diseases (NICD) (1963), and National Centre for Disease Control (NCDC) (2009).

Functions: Nodal agency for **disease surveillance, outbreak response, Antimicrobial Resistance (AMR) control,** referral diagnostics, capacity building, research, and training.

2. Biligiri Rangaswamy Temple Tiger Reserve (BRT)

Located in **BR Hills, Chamarajanagar, Karnataka**, bridging Western & Eastern Ghats. **Declared Tiger Reserve in 2011, area 574.82 sq.km, elevation 5,091 ft**. Named after Biligiri ("white rocky cliff") with ancient Rangaswamy Temple dedicated to Lord Vishnu. **Home to Soliga tribe; first tribal community to get forest rights inside a tiger reserve (2011 judgment).**

Vegetation: scrub, dry/moist deciduous, shola forests, montane grasslands.

Rich flora (Terminalia spp., Anogeissus) and fauna (tiger, elephant, leopard, bison, sambar, etc.).

3. National Medical Register

National Medical Register (NMR) is a **centralized database of registered modern medicine practitioners, maintained by the National Medical Commission (NMC)**. **Launched in August 2024 under Section 31 of the NMC Act, 2019**; registration is mandatory. Eliminates duplication and enables public access to verified doctor information. Stores qualifications, specialisation (in process), registration status, and date, with a unique NMR ID linked to Aadhaar. **State Medical Councils verify degrees; after NMC approval, the NMR ID is issued.**

4. UN Conference on Landlocked Developing Countries

LLDC3 (Third United Nations Conference on Landlocked Developing Countries) – held once every 10 years, focusing on **32 landlocked developing countries (over 600 million people).**

Theme (2025): Driving Progress through Partnerships. Addresses trade, infrastructure, and economic challenges due to lack of seaport access. Implements the Awaza Programme of Action (APoA) 2024–2034, adopted 24 December 2024 by the United Nations General Assembly (UNGA).

Five priorities: Structural transformation & Science, Technology, and Innovation (STI); Trade & integration; Transport & connectivity; Resilience & vulnerability reduction; Implementation & monitoring.

5. Colorado River

Major river of **North America, originating in the Rocky Mountains of Colorado, U.S**. Flows 1,450 miles (2,330 km) into the Gulf of California, Mexico, through 7 U.S. states and 2 Mexican states. **Provides water to 40+ million people; called the "Lifeline of the Southwest**". Forms Lake Mead and Lake Powell; borders Arizona (U.S.) and Mexico for 29 km**. Tributaries include Green, Gunnison, San Juan, Little Colorado, Gila, Virgin Rivers.**

Carved the Grand Canyon (UNESCO site); passes through Canyonlands NP and Horseshoe Bend.

13 AUGUST

1. Bhagirathi River

Bhagirathi River is a **turbulent Himalayan river in Uttarakhand**, one of the two main headstreams of the Ganges (other: Alaknanda).

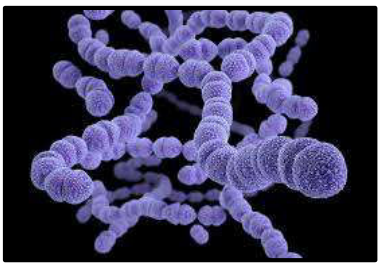
Origin: **Gaumukh Glacier in the Garhwal Himalayas**; mythologically considered the Ganges' source, but hydrologically Alaknanda is longer.

Course: Flows through **Uttarkashi & Tehri**; joined by tributaries like Kedar Ganga and Bhilangana; meets Alaknanda at Devprayag to form the Ganges.

Major Dams: Maneri, Koteshwar, Tehri.

Religious Significance: **Part of Panch Prayag Yatra**; sacred cities include Gangotri (Char Dham site).

2. Pneumococcal disease



Pneumococcal disease is **caused by Streptococcus pneumoniae**, an encapsulated bacterium with a polysaccharide capsule aiding virulence**. There are ~90 serotypes, but few cause most diseases**. Illnesses range from mild (ear infections) to severe (pneumonia, meningitis, bloodstream infections). **Young children and elderly are most affected; causes ~1 million child deaths annually**. Spread via respiratory secretions from patients or carriers.

Treatment: Antibiotics; vaccines prevent infection. Antimicrobial resistance is a rising concern.

3. Sukhna Lake

Artificial lake in Chandigarh at the foothills of the Shivalik Hills, created in 1958 by damming the Sukhna Choe.

Area: Originally 188 ha, now reduced to 1.5 sq. km; **Depth**: from 18 ft to 8 ft 6 in due to siltation.

Fringed by: Golf course (south) and Nek Chand's Rock Garden (west).

Declared National Wetland; part of Sukhna Wildlife Sanctuary. Winter habitat for 30+ migratory species including Siberian ducks, storks, and cranes. Longest rowing and yachting channel in Asia.

4. Tritium

Tritium is a **radioactive isotope of hydrogen with 1 proton, 1 electron, and 2 neutrons, making it unstable**. Naturally produced by cosmic ray interactions; artificially produced in nuclear explosions and reactors. Only radioactive hydrogen isotope, reacts with oxygen to form water; half-life 12.3 years. **Colorless, odorless gas; as liquid, moves easily like water; naturally present in low concentrations.**

Uses: glow-in-the-dark lighting, biomedical tracer for heart disease, cancer & AIDS, potential fusion reactor fuel.

5. Talaq-e-Hasan

Talaq-e-Hasan is an **extrajudicial, revocable Islamic divorce** that **only men can initiate**. **Approved by Prophet Mohammad** and valid under all schools of Muslim law. Requires **three talaq pronouncements at one-month intervals**; the gap is the 'iddat' period (90 days). **Divorce is revoked if the couple resumes cohabitation during 'iddat'**. Triple Talaq (Talaq-e-Biddat), banned in 2019, involved three instant pronouncements with no waiting period, making it instant and irrevocable.

Key difference: Talaq-e-Hasan allows reconciliation; Triple Talaq does not.

14 AUGUST

1. Bandipur Tiger Reserve

Located in **Mysore & Chamarajanagar districts, Karnataka, at the tri-junction of Karnataka, Tamil Nadu & Kerala**. Ecological confluence of the Western & Eastern Ghats; former hunting ground of Mysore rulers. **Part of the Nilgiri Biosphere Reserve (UNESCO World Heritage Site).**

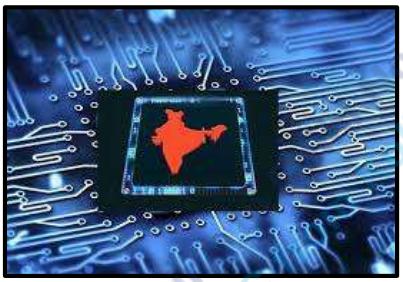
Borders: Nagarahole TR (NW), Mudumalai TR (S), Wayanad WLS (SW).

Rivers: Kabini (north), Moyar (south).

Tropical climate; vegetation: dry to mixed deciduous, rosewood, sandalwood, bamboo.

Fauna: largest wild Asian elephant population in South Asia, Bengal tiger, gaur, dhole, sloth bear.

2. India Semiconductor Mission



India Semiconductor Mission (ISM) is a **specialized independent institution under MeitY and a business division within Digital India Corporation.**

Objective: Build a vibrant semiconductor & display ecosystem, making India a global electronics manufacturing & design hub.

Role: Nodal agency for Semicon India Programme, with full administrative & financial powers; guided by a global expert advisory board.

Launched in 2021 with ₹76,000 crore outlay to support semiconductor, display manufacturing & design.

Four schemes: Semiconductor Fabs, Display Fabs, Compound Semiconductors/ATMP-OSAT, and Design Linked Incentive (DLI).

3. Cess

Cess is an **additional tax imposed for a specific purpose until enough funds are raised.** Different from regular taxes, **it is a tax on tax (e.g., Swachh Bharat cess).** Paid by the public and added to their basic tax liability. Revenue from taxes is used for any purpose, while cess revenue is earmarked for the stated purpose after Parliamentary approval. **Cess proceeds may or**

may not be shared with States, unlike central taxes which must be shared.

4. BHU-NEER Portal

Launched in 2024 by the Central Ground Water Authority (CGWA) under the **Ministry of Jal Shakti.**

Purpose: Streamlined platform for No Objection Certificate (NOC) applications for groundwater abstraction.

Features: Centralized database, PAN-based single ID, NOC with QR code, user-friendly interface, and faster processing.

Replaces older NOCAP system.

Significance: Supports enforcement of guidelines, curbs indiscriminate groundwater extraction, and promotes sustainable management of resources.

5. State Health Regulatory Excellence Index

First-of-its-kind national initiative to benchmark and strengthen state drug regulatory systems. **Proposed by Central Drugs Standard Control Organization (CDSCO) to improve state drug authorities' performance**, ensuring drug safety and quality. **27 indices for manufacturing states, 23 indices for distribution states, across five key themes: Human Resources, Infrastructure, Licensing Activities, Surveillance Activities, and Responsiveness**. Monthly data submission by states; scoring done on the 1st of every month.

SHRESTH (State Health Regulatory Excellence Index): virtual gap assessment tool for maturity certification.

Significance: Enables targeted improvement in Human Resources, infrastructure, and digitization nationwide.

19 AUGUST

1. Bering Strait

Bering Strait is the **northernmost part of the Pacific Ocean**, separating Asia (Russia) and North America (USA). **Lies just south of the Arctic Circle, connecting the Bering Sea to the Chukchi Sea of the Arctic Ocean**. At its narrowest point (85 km), between Cape Prince of Wales (Alaska) and Cape Dezhnev (Russia). International boundary passes through it; average depth 50 m. **Contains Diomede Islands (Russia's Big Diomede, USA's Little Diomede) and St. Lawrence Island (US's 6th largest). International Date Line runs between the Diomede Islands.**

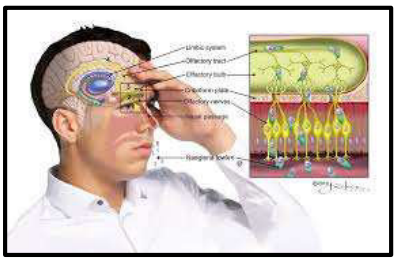
2. Ambergris

Ambergris (whale vomit) is a **solid, waxy substance from sperm whales' digestive system.** Known as **"treasure of the sea" or "floating gold", it is extremely valuable**. Widely used in the perfume industry, traditional medicine, and sometimes as a spice. **Banned in India, USA, and Australia;** in India, **trade is prohibited under the Wildlife Protection Act, 1972.** Formed to cover indigestible squid beaks; after exposure, it turns grey, waxy, and fragrant, found in lumps up to 420 kg.

3. Ravi River

Ravi River flows through northwestern India (Himachal Pradesh, Punjab) and northeastern Pakistan. One of the five tributaries of the Indus, giving Punjab its name.
Origin: Northern face of Rohtang Pass, Himachal Pradesh; joins Chenab in Pakistan.
Length: 720 km (India – 320 km, catchment 14,442 sq.km).
Hydrology: Controlled by snowmelt and monsoon rains (June–Sept).
Tributaries: Siul, Baira, Ujh.
Major dams: Ranjit Sagar (Thein), Chamera I–III.
Allocated to India under the Indus Water Treaty (1960).

4. Primary Amoebic Meningoencephalitis



Primary Amoebic Meningoencephalitis (PAM) is **a rare but deadly brain infection caused by Naegleria fowleri ("brain-eating amoeba").** Found in warm freshwater, soil, swimming pools, hot tubs, it infects through the nose during swimming/diving. Mortality rate >95%, mainly affects young, active people. **PAM (Naegleria fowleri) is rapid and fatal; GAE (Acanthamoeba, Balamuthia) is slower but deadly.**
Symptoms: headache, fever, nausea, sore throat, hallucinations.
Treatment: urgent antibiotics, but recovery is rare.

5. Mount Elbrus

Mount Elbrus is **located in southwest Russia, part of the Caucasus Mountains**. Formed 2.5 million years ago due to the Arabian–Eurasian plate collision; most active in the Holocene Epoch. **Highest peak in Russia and Europe at 5,642 m (18,510 ft). Lies within Prielbrusye National Park and is one of the Seven Summits**. An inactive volcano with two dormant volcanic domes.
Climate: Very cold, even summer nights at -8°C.
Glaciers: Bolshoi Azaou, Irik; Rivers: Baksan, Malka, Kuban.

20 AUGUST

1. United Nations High Commissioner for Refugees

United Nations High Commissioner for Refugees (UNHCR) is a UN agency protecting and resettling refugees worldwide. **Established in 1950 by the UN General Assembly after WWII.**
Mandate: Save lives, protect rights, and secure the future of those fleeing conflict and persecution.
Governance: Overseen by UNGA and ECOSOC; programmes approved by the Executive Committee; High Commissioner appointed by UNGA.
Funding: Voluntary contributions from governments, private donors, and organisations.
Awards: Nobel Peace Prizes (1954, 1981); initiated Nansen Refugee Award (1954).
Headquarters: Geneva, Switzerland.

2. Udyam Sakhi Portal

Udyam Sakhi Portal was **launched by the Ministry of MSME in March 2018**. It provides information on schemes, policies, and programmes for women entrepreneurs in the MSME sector. **Acts as a network to nurture entrepreneurship and promote low-cost business models**. Helps women to start, build, and grow businesses towards self-reliance.

Key services: entrepreneurship learning tools, incubation, fundraising training, mentorship, investor meets, market survey facilities, and technical training.

3. Minimum Public Shareholding

Minimum Public Shareholding (MPS) is **mandated by SEBI under Securities Contracts (Regulation) Rules, 1957 and LODR Regulations**. All listed companies must maintain at least 25% public shareholding (non-promoter entities). Promoters holding above 75% must reduce stake via institutional placements or rights issues.

Objectives: enhance liquidity, fair price discovery, broader participation, and governance.

Newly listed firms must comply within 3 years (or 5 years if market cap > ₹1 trillion). If public shareholding dips below 25%, it must be restored within 12 months.

4. e-Jagriti Platform

e-Jagriti is a **flagship initiative of the Department of Consumer Affairs to strengthen consumer dispute redressal**. Computerizes and networks Consumer Commissions at national, state, and district levels for transparency and efficiency. Allows online filing of complaints, fee payment, case tracking, and access to judgments. **Integrates platforms like OCMS, E-Daakhil, NCDRC CMS, CONFONET, and mediation app**. Uses AI/ML for smart search, metadata creation, and voice-to-text conversion. Ensures speedy, cost-effective, and transparent redressal for consumers.

5. Sustainable Aviation Fuel

Sustainable Aviation Fuel (SAF) is a **bio-jet fuel made from renewable biomass, waste oils, municipal waste, and non-food crop**s. Chemically similar to Aviation Turbine Fuel (ATF), allowing direct use in existing aircraft engines as SAF-ATF blends**. It can also be produced synthetically by capturing carbon from air**. Carbon footprint is much lower than conventional jet fuel. Does not compete with food/water resources and avoids deforestation. **Key to decarbonising aviation, though it currently forms only 0.3% of aviation fuel use.**

21 AUGUST

1. Mines and Minerals (Development and Regulation) Amendment Bill, 2025

Amends Mines and Minerals (Development and Regulation) Act, 1957. Leaseholders may add other minerals to an existing lease; no extra payment for

critical/strategic minerals like **lithium, cobalt, nickel, gold, silver**. National Mineral Exploration Trust's scope widened to fund mine development. **Removes 50% sale cap for captive mines**. One-time lease area extension allowed for deep-seated minerals (>200m depth). Establishes mineral exchanges, with rules on registration, fees, insider trading prevention, and grievance redressal.

2. Pamba River

Pamba River is the third longest river in Kerala after Periyar and Bharathappuzha. Known **as Dakshina Bhageerathi / Ganga of Kerala**, it is significant for the **Sabarimala temple**, where pilgrims take a holy dip. Called Thriveni Sangam at the confluence of **Pamba, Achankovil, and Manimala**. Originates at 1650 m in Pulachimalai Hill, Western Ghats, flows 176 km, and drains into the Arabian Sea.

Basin area: 2235 sq. km, entirely within Kerala.

Major tributaries: Kakki Ar, Azhuta Ar, Kakkad Ar, Kallar, Manimala, Achenkovil.

3. Snow Leopard

Snow Leopard: A medium-sized big cat, called the **'ghost of the mountains'**, adapted to cold, rugged terrains of Central & South Asia.

Distribution: Found in 12 countries including India (J&K, Himachal, Uttarakhand, Sikkim, Arunachal). Prefers elevations 3,000–5,000 m.

Features: Pale grey fur with rosettes for camouflage; long tail for balance & warmth; solitary except during mating/offspring care.

Conservation Status: IUCN–Vulnerable, CITES–Appendix I, WPA 1972–Schedule I.

4. Anna-Chakra

Anna-Chakra is a **supply chain optimisation tool under the Public Distribution System (PDS)**. Developed with World Food Programme (WFP), FITT-IIT Delhi, and **spearheaded by the Department of Food and Public Distribution.** Uses advanced algorithms to optimise routes for seamless food grain movement. Covers 4.37 lakh Fair Price Shops and 6,700 warehouses. **Integrated with Railways' FOIS via ULIP and PM Gati Shakti platform.**

Benefits: faster, cost-effective, fuel-efficient logistics with reduced carbon footprint, supporting 81 crore beneficiaries.

5. NAVYA Initiative

NAVYA (Nurturing Aspirations through Vocational training for Young Adolescent Girls) targets girls aged 16–18 years in aspirational districts. **A joint initiative of the MSDE and MWCD**.

Focus: demand-driven vocational training in both traditional & non-traditional sectors.

Covers holistic development: health, hygiene, nutrition, financial literacy, life skills, legal awareness. Promotes **employability, self-employment, internships, apprenticeships**. Training 3,850 girls under PMKVY 4.0 in modern job roles (digital marketing, cybersecurity, AI, green jobs). Implemented across 19 States and 27 districts.

22 AUGUST

1. Mithi River

Mithi River flows through **Mumbai, Maharashtra, and is one of the city's four rivers.** Originates from the overflow of Vihar Lake and later receives overflow from Powai Lake.

Length: 18 km, discharging into the Arabian Sea at Mahim Creek.

Passes through Powai, Saki Naka, Kurla, Kalina, Vakola, BKC, Dharavi, and Mahim.

Width: 5 m (upper reaches), 25 m (middle), 70 m (lower reaches post-2005 deluge).

Seasonal river dependent on monsoons.

2. Blue Carbon

Blue Carbon is **organic carbon stored in coastal ecosystems like mangroves, saltmarshes, and seagrass meadow**s. "Blue" highlights the watery nature of this storage. While most oceanic carbon is dissolved CO_2, smaller amounts are in sediments, vegetation, soils, DNA, proteins, and marine life. **These ecosystems, though covering only 2% of ocean surface, contribute to 50% of ocean's carbon absorption**. They play a vital role in climate change mitigation.

3. Jeju Island

Jeju Island (Jejudo) is a **volcanic island in the East China Sea, part of Jeju Province, South Korea**. Largest island of South Korea with an area of 1,846 sq.km., located 130 km off the Korean Peninsula.

Capital: Jeju City.

Dimensions: 64 km east–west, 26 km north–south.

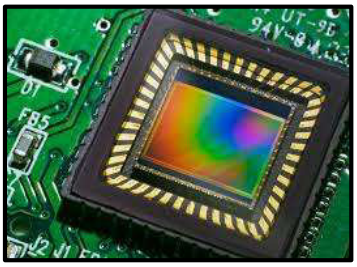
Contains UNESCO World Heritage Site – Jeju Volcanic Island and Lava Tubes.

Dominated by **Hallasan (1,950 m), the tallest mountain in South Korea, with 360 satellite volcanoes.**

4. Indian Council of Social Science Research

Indian Council of Social Science Research (ICSSR) is the **apex body for social and human sciences research, established in 1969 on Prof. V. K. R. V. Rao Committee's recommendation**. It is an **autonomous body under the Ministry of Education**. Supports research via projects, fellowships, internships, training, publications, and seminars. **Maintains an all-India network of 24 institutes, 6 regional centres, and 5 recognised institutes**. NASSDOC provides documentation and library services. ICSSR Data Service promotes sharing and reuse of social science data.

5. Charge-Coupled Device



Charge-Coupled Device (CCD) **converts light into electrical signals using an array of capacitors (pixels**). Each pixel acts as a light sensor, collecting photons and converting them into electrical charges.

Working: Uses the photoelectric effect – photons generate electron-hole pairs, charges are stored in

capacitors, and sequentially transferred to a readout register.

Output: Charges converted into voltage signals, digitised to form precise images.

Applications:

- **Household**: Digital cameras, CCTV.
- **Medical**: X-ray imaging, CT scans, endoscopy, microscopes.
- **Astronomy**: Detecting faint celestial objects.

25 AUGUST

1. Advanced Medium Combat Aircraft

Advanced Medium Combat Aircraft (AMCA): **India's fifth-generation fighter jet under DRDO. Joint engine manufacturing with France's Safran.**

Project cost: ~Rs 15,000 crore.

Timeline: Prototype by 2028-29, induction by 2034-35.

Key features:

- Stealth capability
- Twin-engine with supercruise
- AI-enabled avionics
- AESA radar for long-range target detection.

2. Integrated Food Security Phase Classification

Integrated Food Security Phase Classification (IPC): Standardized international tool to measure and communicate food insecurity.

Confirmed Famine in Gaza: Over 500,000 people trapped in famine with starvation, destitution, and preventable deaths.

Genesis (2004): Developed by FSNAU under FAO in Somalia.

Partnership: An innovative 21-partner initiative including UN agencies & NGOs.

Governance:

- IPC High Level Executive Committee – top entity.
- IPC Global Steering Committee – governing body.

3. Drake Passage

Magnitude 7.5 earthquake struck the Drake Passage near Argentina and Chile.

Location: Between Cape Horn (South America's southern tip) and South Shetland Islands (north of Antarctic Peninsula).

Named after Sir Francis Drake, English navigator.

Ocean Current: Part of the Antarctic Circumpolar Current (world's most voluminous, west to east flow).

Historic Trade Route: Vital before Panama Canal (1914).

Sailing Challenge: Stormy seas, icy conditions, tough Cape Horn rounding.

4. Asia-Pacific Institute for Broadcasting Development

Asia-Pacific Institute for Broadcasting Development (AIBD) was **founded in 1977 under UNESCO**. It is a regional inter-governmental organization for electronic media cooperation.

Mandate: To build a vibrant and cohesive electronic media environment in the Asia-Pacific region.

Membership: 92 member organizations from 45 countries.

India is a founding member, represented by Prasar Bharati under the Ministry of Information & Broadcasting.

Secretariat: Located in Kuala Lumpur.

India elected Chairman of AIBD Executive Board at the 23rd General Conference in Thailand.

5. Druzhba Pipeline

Druzhba (Friendship) Pipeline is among the largest crude oil pipeline networks in the world.

Total length: 5,500 km.

It **originates in Russia and passes through Belarus and Ukraine**. The pipeline supplies crude oil to Slovakia and Hungary. Recently, a Ukrainian attack disrupted Russian oil flows through this network, impacting Hungary and Slovakia.

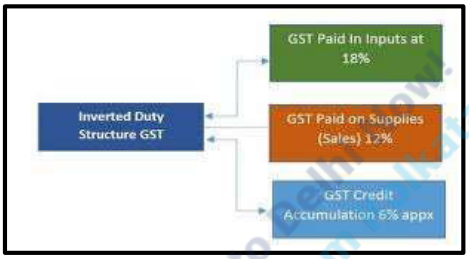
27 AUGUST

1. Vibrant Villages Programme

Vibrant Villages Programme (VVP-I): A Centrally Sponsored Scheme (2022-26) for 2,967 villages in border areas of **Arunachal Pradesh, Himachal Pradesh, Sikkim, Uttarakhand, and Ladakh.** Aims to **reverse outmigration, boost security, and develop infrastructure, livelihood, tourism, skill development, agriculture, and renewable energy**. Action Plans made with Gram Panchayats; ensures 100% saturation of schemes; no overlap with Border Area Development Programme.

VVP-II (2025-29): A Central Sector Scheme with ₹6,839 crore outlay, covering border villages (except Northern border) across 16 States/UTs, advancing Viksit Bharat@2047 vision.

2. Inverted Duty Structure



Inverted Duty Structure (IDS) under GST occurs when the tax rate on inputs is higher than on outputs.

Example: Textile industry – inputs taxed at 12–18%, outputs at 5%.

Leads to accumulation of Input Tax Credit (ITC), as it cannot be fully utilized against output tax. **Results in higher tax costs for businesses/consumers**. GST law allows refund/reversal of unutilized ITC, calculated using turnover and net ITC. Refund not allowed in cases of nil/exempt supplies, goods under export duty, IGST refund claims, or duty drawback.

3. Sutlej River

Sutlej River is the longest of the five rivers of Punjab and an important tributary of the Indus. **Also known as Satadree**.

Origin: Lake Rakshastal, Tibet (4,600 m); enters India via Shipki La Pass in Himachal Pradesh.

Joins **Beas River, then Chenab** → forms Panjnad, flowing into Indus.

Length: 1,550 km (529 km in Pakistan).

Fed by snowmelt & monsoon.

Major tributaries: Spiti, Baspa, Soan, Nogli Khad.

Key projects: Bhakra-Nangal, Kol Dam, Nathpa Jhakri, Baspa Hydel.

Indus Waters Treaty allocates its waters to India.

4. Rare earth magnets

Rare earth magnets are permanent magnets made from alloys of rare earth elements.

Properties: Exceptional magnetic strength, high energy density, compact size performance.

Types:

- **Neodymium (Nd-Fe-B)** – neodymium, boron, iron.
- **Samarium Cobalt (SmCo)** – samarium, cobalt.

Both are **very strong, brittle, corrosion-prone, usually nickel-plated**. China dominates supply (≈90% processing).

Uses: Medical imaging (MRI, PET, X-ray), aviation, defense, electronics, smartphones, EVs, hard drives, jewelry, consumer goods.

5. New World screwworms

New World screwworms are **blue-grey blowflies found in South America and the Caribbean**. Named for their screwlike burrowing into tissue. **Females lay eggs (up to 3,000 in a lifetime) in open wounds or cavities of warm-blooded animals and humans**. Eggs hatch into larvae (maggots) that feed on living flesh, causing painful infestations. After feeding, larvae drop to soil, pupate, and re-emerge as adults.

Symptoms: non-healing wounds, bleeding sores, sensation of larvae movement, foul odour.

Infestations are extremely painful and can be fatal if untreated.

28 AUGUST

1. Export Promotion Mission

Export Promotion Mission announced in Union Budget 2025-26 for FY 2025-31. **Aims for inclusive and sustainable export growth, especially for MSMEs**. Jointly driven by Commerce, MSME, and Finance Ministries; Department of Commerce is lead.

Two sub-schemes: Niryat Protsahan (₹10,000+ cr) and Niryat Disha (₹14,500+ cr).

- **Niryat Protsahan**: interest equalisation support (₹5,000+ cr), trade finance, e-commerce exporter credit card.
- **Niryat Disha**: quality compliance, overseas market development, branding, warehousing, logistics, capacity building.

2. Guillain-Barré Syndrome

Guillain-Barré Syndrome (GBS) is a rare autoimmune disorder where the immune system attacks the peripheral nervous system. Also **called acute inflammatory demyelinating polyradiculoneuropathy (AIDP); mostly affects ages 30–50.**

Causes: Often follows viral/bacterial infection, vaccination, or surgery.

Symptoms: Start with fever, then weakness/paralysis progressing rapidly; severe cases may cause breathing failure.

Treatment: No cure, but therapies ease symptoms and speed recovery.

Prognosis: Most recover; some face long-term disability or rare fatalities.

3. Pong Dam

Pong Dam (Beas Dam) is an **earth-fill embankment dam on the Beas River in Kangra, Himachal Pradesh**. Built between 1961–1974, it was then the tallest dam of its type in India. **Created the Maharana Pratap Sagar, declared a bird sanctuary (1983) and a Ramsar site (2002).** Supports irrigation, hydroelectric power, and is the most important fish reservoir in Himachal's Himalayan foothills. Home to migratory birds like Bar-headed Geese, Red-neck Grebe, and Black Stork.

Key specs: 133 m tall, 1,951 m long, 610 m base width.

4. Gorumara National Park

Gorumara National Park is in **Jalpaiguri, West Bengal, covering 79.45 sq. km, declared a National Park in 1992.** Located in the Terai region of Dooars, on banks of Murti & Raidak rivers, at the foothills of Eastern Himalayas. Known **for rich biodiversity, especially Greater One-Horned Rhinoceros.**

Flora: Sal forests, Teak, Rain Tree, Silk Cotton, Bamboo groves, Terai grasslands, orchids.

Fauna: Rhino, elephant, bison, leopard, deer species, wild boar, peafowl, hornbill.

Greater One-Horned Rhino: Largest Asian rhino, Rhinoceros unicornis, semi-aquatic grazer, found in India & Nepal; IUCN: Vulnerable.

5. Project Aarohan

Project Aarohan supports the educational aspirations of children of toll plaza employees. **Launched by NHAI, to benefit families at toll plazas nationwide**. **Targets EWS, SC/ST/OBC, minorities, first-generation learners, and girls from low-income households**. Provides scholarships, mentorship, skill-building workshops, and career guidance. **Implemented by SMEC Trust's Bharat Cares.**

Funding: ₹1 crore (July 2025–March 2026).

500 students (Class 11–Graduation) get ₹12,000 annually; 50 PG aspirants get ₹50,000 each.

29 AUGUST

1. International Atomic Energy Agency (IAEA)

Inspectors from the International Atomic Energy Agency (IAEA) have started inspections at key nuclear facilities in Bushehr, Iran.

Genesis: Established in 1957.

Nature: Acts as the world's central intergovernmental forum for scientific and technical cooperation in the nuclear field.

Functions:

- Promotes the **safe, secure, and peaceful use of nuclear science and technology.**
- Contributes to **international peace and security.**
- Supports the achievement of the United Nations Sustainable Development Goals (SDGs).

Policy-making bodies:

- The General Conference (all member states).
- The Board of Governors (35 members).

Headquarters: Vienna, Austria.

Recognition: Awarded the Nobel Peace Prize in 2005.

2. Article 9.1 of the Paris Agreement

India and other developing countries are pushing to bring Article 9.1 of the Paris Agreement back to the core of negotiations at COP30 in Belém, Brazil.

Article 9.1 (Core Principle): Developed countries "**shall provide financial resources" to assist developing countrie**s in mitigation and adaptation efforts. This obligation is not new, but a continuation of their existing commitments under the UNFCCC. The principle is anchored in **Common but Differentiated Responsibilities (CBDR)** and the idea of historical responsibility of developed nations in causing climate change.

3. UDISE+

UIDAI and Ministry of Education have collaborated to facilitate the pending Mandatory Biometric Update (MBU) in Aadhaar through the UDISE+ application.

About UDISE+

Educational Management Information System under the **Department of School Education & Literacy, Ministry of Education.**

Objective: To collate credible and comparable educational data using a standardized Data Capture Format, collected online and in real-time.

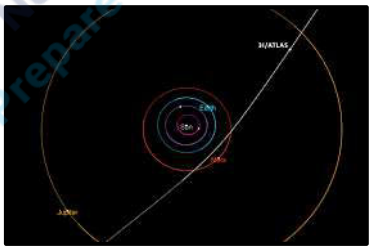
Serves as a central platform for schools to:

- Record and submit data on infrastructure and facilities.
- Maintain **student-wise and teacher-wise details**.

4. Exercise Bright Star

Exercise Bright Star was conceived as a **bilateral exercise between the US and Egypt after the Camp David Accord (1977)**. The first edition was held in 1980 in Egypt. Since 1995, the exercise has expanded into a multilateral format with participation from several nations. It is **considered one of the largest Tri-Service multilateral exercises in the region.**

5. 3I/ATLAS



3I/ATLAS is a **comet discovered in 2025 by the ATLAS (Asteroid Terrestrial-impact Last Alert System) survey telescope located in Rio Hurtado, Chile**. It is the third known interstellar object detected from outside our solar system. **The first interstellar object was 1I/'Oumuamua (2017), followed by 2I/Borisov (2019)**. It is categorized as interstellar due to the hyperbolic shape of its orbital path. Unlike **normal comets, it does not follow a closed orbit around the Sun.**