



THE EDGE

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JULY 2025

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POLITY, CONSTITUTION & GOVERNANCE

1. The Preamble Debate: Re-examining “Socialist” and “Secular”

Context: Recently, the inclusion of the words “Socialist” and “Secular” in the Preamble of the Indian Constitution has been revisited in political and academic circles. These terms were added during the Emergency period via the 42nd Constitutional Amendment Act, 1976. The debate questions both the legitimacy of their inclusion and their contemporary relevance.

About:

- **Original Preamble (1950):**

- ✓ Drafted without the words “Socialist” and “Secular”.
- ✓ The Constituent Assembly deliberately excluded them, with Dr. B.R. Ambedkar arguing that these ideals were already implicit in the Directive Principles (Art. 38, 39) and Fundamental Rights (Art. 25–28).
- ✓ Ambedkar preferred flexibility over constitutional rigidity in ideological matters.

- **42nd Amendment (1976):**

- ✓ Introduced the words “Socialist” and “Secular” to the Preamble.
- ✓ Enacted during the Emergency under PM Indira Gandhi, leading to criticisms over the lack of democratic debate.

- **Meaning in Indian Context:**

- ✓ **Socialist:** Reflects commitment to economic and social justice, not classical socialism or abolition of private property.
- ✓ **Secular:** Implies State neutrality in religious matters and equal treatment to all religions (distinct from Western secularism).

- **Judicial View:**

- ✓ In cases like *Kesavananda Bharati* (1973) and later judgments, the Supreme Court held both terms to be part of the Basic Structure Doctrine, hence cannot be removed.

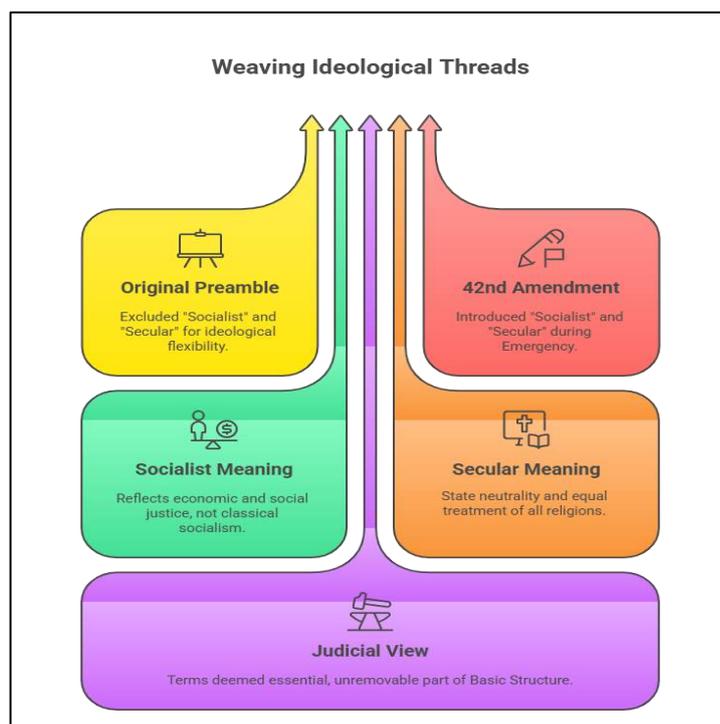
Why the Debate Now?

- **Arguments to Retain:**

- ✓ Reinforce social justice and religious equality.
- ✓ Serve as interpretative tools for judiciary and governance.
- ✓ Reflect the spirit and direction of the Constitution.

- **Arguments to Reconsider/Remove:**

- ✓ Emergency-era amendment lacked due democratic process.
- ✓ These values are already embedded in other provisions.
- ✓ Ambedkar’s vision opposed prescriptive ideological labels in the Constitution.



2. Vice-President of India

Context: On 21st July 2025, Vice-President Jagdeep Dhankhar resigned citing health reasons under Article 67(a). This is the third such resignation in Indian history after V.V. Giri (1969) and R. Venkataraman (1987). The 17th Vice-Presidential election is scheduled for September 9, 2025.

Constitutional Provisions (Articles 63–68)

- Article 63: Establishes the office
- Article 64: Ex-officio Chairman of Rajya Sabha
- Article 65: Acts as President in vacancy/incapacity (up to 6 months)
- Article 66: Election by MPs (Lok Sabha + Rajya Sabha, incl. nominated)
- Article 67: Term (5 years), resignation/removal
- Article 68: Timelines for filling vacancy

Election Process

- Electoral College: Only MPs (both Houses); states not involved
- Voting: Proportional Representation via Single Transferable Vote
- Eligibility: Indian citizen, ≥35 years, eligible for Rajya Sabha, no office of profit
- Nomination: 20 proposers + 20 seconders; ₹15,000 deposit

Role & Functions

- Legislative: Presides over Rajya Sabha; casting vote in case of tie
- Executive (Contingent): Acts as President during vacancy, max 6 months
- Cannot perform both roles simultaneously

Removal vs Resignation

- Resignation: To President (Art. 67(a)) – immediate
- Removal: Resolution by Rajya Sabha (effective majority) + Lok Sabha (simple majority) after 14-day notice (Art. 67(b))

3. Presidential Reference on Timelines for Governors

Context: In July 2025, the Supreme Court issued notices to the Centre and all States on a Presidential Reference under Article 143.

The issue: Can courts compel the President and Governors to act within fixed timelines on Bills passed by State legislatures?

Background of the Case:

- In April 2025, the Supreme Court ruled that the Tamil Nadu Governor's delay in assenting to 10 re-passed Bills was illegal.
- The Court laid down judicially enforceable timelines for constitutional authorities.
- Following this, the President referred 14 questions to the Court for advisory opinion.

Article 143: Presidential Reference

- Empowers the President to seek SC's opinion on legal/public issues of importance.
- Article 143(1): Advisory opinion on legal/factual matters (even without a pending case).
- Article 145(3): Requires a Constitution Bench (minimum 5 judges) to hear such references.
- Used at least 14 times since Independence.

Supreme Court's Discretion:

- SC may decline to answer, as seen in:
 - ✓ Ayodhya Reference (1993)
 - ✓ Special Courts Bill Case (1978)
- If declined, SC must provide recorded reasons.
- Avoids issues involving political questions or ongoing cases.

Binding Nature of Advisory Opinions:

- Not binding like adjudicatory verdicts (per Article 141).
- Hold persuasive value (St. Xavier's case, 1974).
- May influence future rulings but cannot override binding judgments (e.g., April 2025 verdict).

Significance:

- Raises key issues of separation of powers, executive accountability, and judicial oversight.
- May clarify the role and limits of Governors and President in legislative processes.
- Likely to influence ongoing constitutional debates in states like Kerala and Punjab.

4. Balancing Fundamental Rights: Article 19 vs Article 21

Context: In a recent case involving comedians accused of making derogatory remarks against persons with disabilities (PwDs), the Supreme Court of India underscored a critical constitutional principle—that the right to life and dignity under Article 21 must prevail over the right to free speech under Article 19 when the two come into conflict.

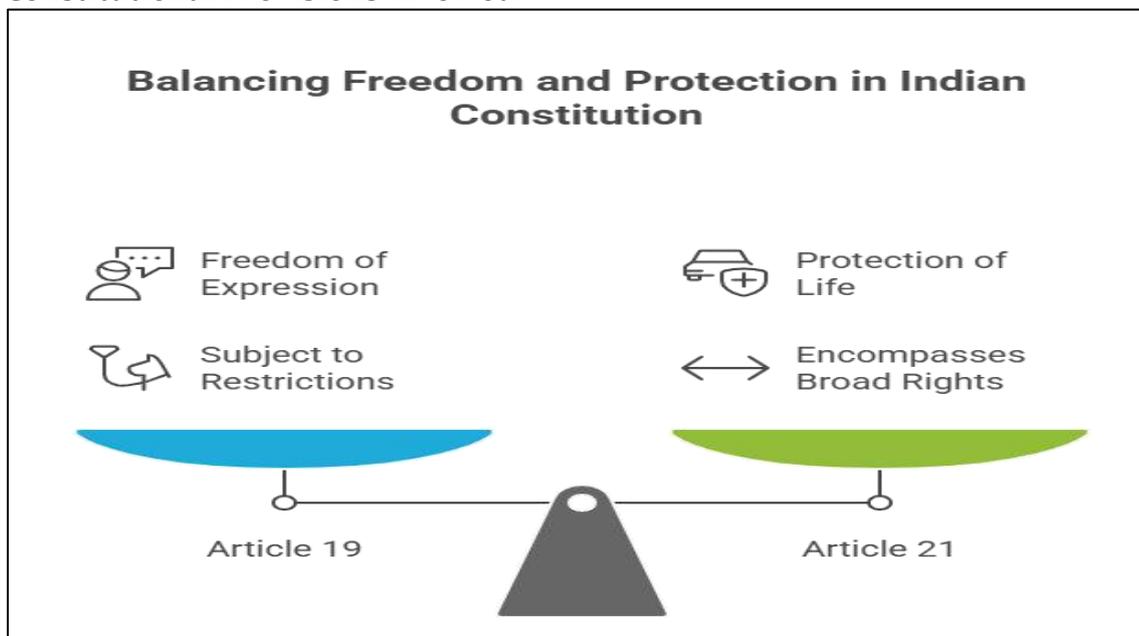
Background:

- The observation came during hearings in *M/s Cure SMA Foundation of India v. Union of India & Ors* (2025) and related petitions, where multiple FIRs had been filed against comedians and YouTubers for mocking PwDs in public performances and online shows. The Court emphasized the need for guidelines to regulate content on social media and uphold constitutional morality.

Key Judicial Observations:

- The bench, comprising Justices Surya Kant and Joymalya Bagchi, held that "Article 19 cannot prevail over Article 21."
- The Court stressed that the right to dignity, especially of vulnerable sections, cannot be compromised for comedic or expressive liberty.
- It called for an "open debate" among stakeholders to formulate regulatory mechanisms for digital content while safeguarding constitutional freedoms.

Constitutional Provisions Involved:



- **Article 19 – Freedom of Speech and Expression:**
 - ✓ Grants citizens the right to express freely.
 - ✓ Subject to reasonable restrictions under Article 19(2) on grounds like decency, public order, defamation, etc.
 - ✓ **Notable cases:** Romesh Thapar (1950), Shreya Singhal (2015).
- **Article 21 – Right to Life and Personal Liberty:**
 - ✓ Protects life and dignity of every individual.
 - ✓ Encompasses rights like livelihood, reputation, privacy, and pollution-free environment.
 - ✓ **Landmark cases:** Maneka Gandhi (1978), Olga Tellis (1985), Vishaka (1997).

5. Monsoon Session 2025 & Parliamentary Functioning

Context: The Monsoon Session 2025 of Parliament has commenced, featuring 21 sittings and the introduction of eight new bills. A key legislative milestone includes the passage of the Bills of Lading Bill, 2025, modernising India's maritime trade law.

Sessions of Parliament: Constitutional Framework

- Parliamentary sessions are convened under Article 85 of the Constitution, which empowers the President to summon each House, ensuring no more than six months elapse between sessions.
- **India conventionally holds three main sessions:**

- ✓ **Budget Session (Feb–May):** Begins with the President’s address and focuses on the Union Budget.
- ✓ **Monsoon Session (July–Aug):** Prioritises legislative business and government accountability.
- ✓ **Winter Session (Nov–Dec):** Reviews policy performance and concludes the annual legislative calendar.

- Additionally, Special Sessions are convened for urgent or historic matters, as seen during the 1962 Sino-Indian war or the 1971 India-Pakistan conflict.

Parliamentary Procedures: Instruments of Accountability

- **Adjournment:** Temporary suspension by the presiding officer.
- **Adjournment sine die:** Ends a sitting without setting the date for the next.
- **Prorogation:** Official termination of a session by the President.
- **Dissolution:** Applicable only to Lok Sabha, marking the end of its term.
- **Quorum:** Minimum number of members required—55 in Lok Sabha, 25 in Rajya Sabha.

Key Legislative Highlight: Bills of Lading Bill, 2025

- This Bill replaces the Indian Bills of Lading Act, 1856, providing a modern legal framework for maritime commerce. It:
 - ✓ Recognises the Bill of Lading (BoL) as legal evidence of cargo.
 - ✓ Clarifies rights and liabilities of carriers and recipients.
 - ✓ Aligns with global maritime standards, improving legal certainty and trade efficiency.
 - ✓ Empowers the Ministry of Ports, Shipping & Waterways to oversee implementation.

Monsoon Session 2025: Legislative Agenda

- New bills to be introduced include:
 - ✓ Geoheritage Sites and Geo-relics Bill
 - ✓ Mines and Minerals (Amendment) Bill
 - ✓ National Sports Governance Bill
- These propose reforms in cultural preservation, resource regulation, and sports management, respectively.

Deliberative Tools: Question Hour & Zero Hour

- **Question Hour**
 - ✓ Conducted at the start of each sitting.
 - ✓ Allows MPs to question ministers on governance issues.
 - ✓ Includes:
 - Starred Questions (oral)
 - Unstarred Questions (written)
 - Short Notice Questions (urgent issues)
 - Private Member Questions
 - ✓ It enhances executive accountability and policy scrutiny.
- **Zero Hour**
 - ✓ Begins post-Question Hour, around 12 noon.
 - ✓ Not mentioned in rules but evolved as a convention.
 - ✓ Enables MPs to raise urgent public issues without prior notice, thus reinforcing participatory democracy.

6. Supreme Court's Call for Reform: Reassessing the Anti-Defection Law

Context: The Supreme Court of India has recently criticized delays and potential biases in handling disqualification petitions under the Anti-Defection Law. It specifically directed the Telangana Assembly Speaker to act on long-pending petitions involving the defection of 10 BRS MLAs to the Congress party.

About the Anti-Defection Law:

- **Background:**
 - ✓ The term ‘Aaya Ram, Gaya Ram’ became emblematic of frequent political defections in India, following a 1967 incident involving an MLA who switched parties multiple times in a single day.

✓ To curb such unethical political behavior, the Tenth Schedule was introduced through the 52nd Constitutional Amendment Act, 1985.

• **Key Provisions:**

✓ **A legislator can be disqualified if:**

- They voluntarily give up membership of their party.
- They vote or abstain from voting against the party whip without prior permission.
- An independent member joins a political party post-election.
- A nominated member joins a party after six months of nomination.

✓ **Exceptions (now limited):**

- Initially, a one-third split in a party was a valid ground for exemption.
- However, the 91st Amendment Act, 2003 removed the split clause, leaving only merger (two-thirds support) as a valid exception.

Judicial Interpretations:

- Kihoto Hollohan v. Zachillhu (1992):
 - ✓ Speaker's decisions are subject to judicial review.
- Keisham Meghachandra Singh Case (2020):
 - ✓ Directed that Speakers should decide disqualification petitions within three months.

Do You Know?

- The Representation of the People Act, 1951 governs electoral disqualifications:
- Section 8(3): Disqualifies convicted lawmakers for two years or more.
- In Lily Thomas v. Union of India (2013), SC ruled for instant disqualification upon conviction, striking down the previous three-month appeal window.

7. National Sports Governance Bill, 2025

Context: The Ministry of Youth Affairs and Sports recently introduced the National Sports Governance Bill, 2025 in the Lok Sabha. It aims to establish a robust legal framework for sports administration in India, replacing the older Sports Code (2011), which lacked statutory authority.

Why This Bill Was Needed

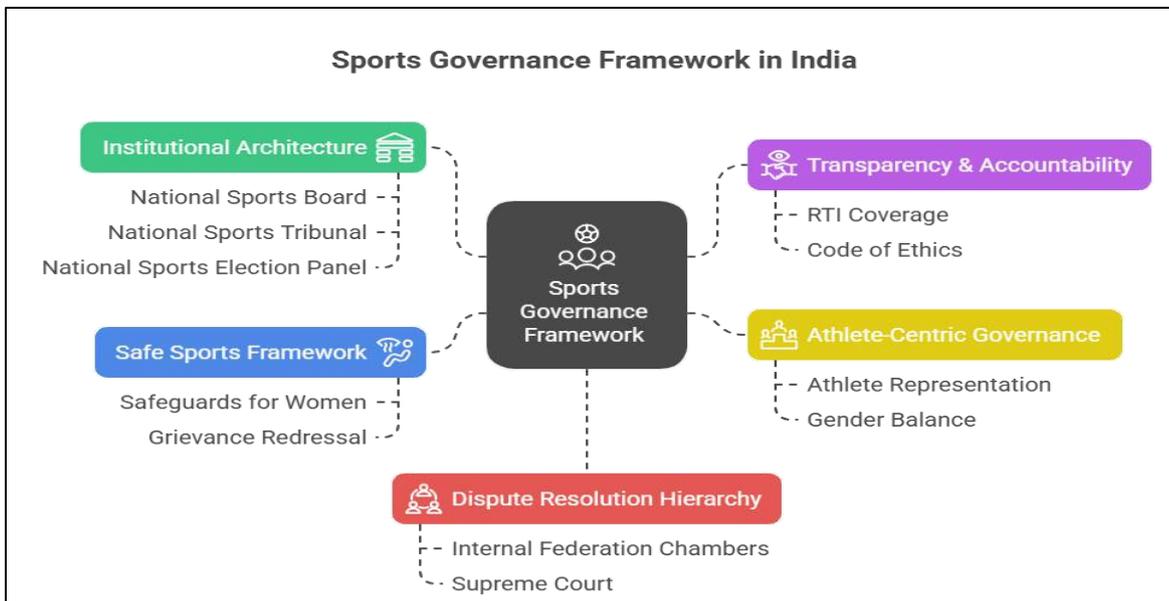
- **Chronic Governance Issues:** India's sports sector has long suffered from administrative opacity, frequent court interventions, and power concentration within federations.
- **Judicial Overreach:** Absence of statutory backing led to high judicial involvement in matters like election disputes and athlete grievances.
- **Ad hocism:** Many sports federations currently function under ad hoc committees due to internal dysfunction.

Key Objectives

- Provide a statutory framework for sports governance in India.
- Establish specialized institutions for regulation, dispute resolution, and ethical oversight.
- Promote transparency, inclusivity, and athlete welfare across all sports bodies.
- Prepare India for a potential Olympics 2036 bid with global governance standards.

Major Provisions

Sports Governance Framework in India



- **Institutional Architecture:**
 - ✓ National Sports Board (NSB): Regulates and grants recognition to national sports bodies.
 - ✓ National Sports Tribunal: Adjudicates sports-related disputes with civil court powers.
 - ✓ National Sports Election Panel: Ensures fair elections across sports federations.
- **Transparency & Accountability:**
 - ✓ RTI Coverage: All recognized sports bodies, including BCCI, to be under RTI Act.
 - ✓ Code of Ethics: Mandatory ethical framework aligned with international charters.
- **Athlete-Centric Governance:**
 - ✓ Minimum 10% athlete representation in voting bodies; at least 25% executives must be former athletes.
 - ✓ Focus on gender-balanced representation in all decision-making bodies.
- **Safe Sports Framework:**
 - ✓ Safeguards for women and minor athletes in line with the POSH Act.
 - ✓ Dedicated grievance redressal mechanism to address harassment and abuse.
- **Dispute Resolution Hierarchy:**
 - ✓ Internal federation chambers → National Sports Tribunal → Supreme Court.
 - ✓ Inspired by global models like FIFA's Dispute Resolution Chamber and CAS (Court of Arbitration for Sport).

8. National Anti-Doping (Amendment) Bill, 2025

Context: The National Anti-Doping (Amendment) Bill, 2025 was introduced in the Lok Sabha on July 23, 2025, amending the National Anti-Doping Act, 2022. It aims to reinforce India's legal and institutional commitment to doping-free sports in line with global standards.

What is Doping?

- Doping refers to the use of prohibited substances or methods by athletes to unfairly enhance performance.
- Criteria include: performance enhancement, health risks, and being against sporting ethics.
- World Anti-Doping Agency (WADA), formed in 1999, sets global standards for testing and compliance.

Key Amendments Proposed:

- **Appeal Panel Constitution:**
 - ✓ Power shifted from the National Board to the Central Government to constitute the Appeal Panel and set procedures.
- **Operational Autonomy:**
 - ✓ Removes Board's powers to issue directions to panels.
 - ✓ Ensures NADA's independence from government and sports bodies.
- **Appeals to CAS:**

- ✓ Limits appeals to specified bodies like WADA, IOC, IPC, etc.
- ✓ Allows direct appeal to CAS in international-level cases.
- **Anti-Doping Violations:**
 - ✓ Now defined by the World Anti-Doping Code; violations include presence, use, or concealment of banned substances, and whereabouts failures.
- **Testing Standards:**
 - ✓ Mandatory WADA accreditation for all dope testing laboratories.
 - ✓ Review of adverse reports must verify compliance with WADA standards.

Significance of the Bill:

- Provides statutory backing to NADA and the National Dope Testing Laboratory.
- Promotes institutional accountability, athlete rights, and global cooperation.
- Aims to build capacity for hosting major sports events and encourage academic and scientific research.
- Supports India's vision of clean, fair sports and aligns with international obligations.

9. Parliamentary Panel's Recommendations on Income Tax Bill 2025

Context: The Income Tax Bill 2025, which seeks to replace the Income Tax Act of 1961, was recently reviewed by a Parliamentary Select Committee. The panel has tabled its report in the Lok Sabha, recommending several key amendments to address stakeholder concerns and streamline the taxation framework.

Key Recommendations:

- **Expanded Definition of Beneficial Owner:** The panel recommends broadening the definition to include individuals who derive direct or indirect benefits from shareholdings during a tax year. This aims to improve transparency and ensure such individuals are eligible to carry forward business losses.
- **Inter-Corporate Dividends:** It suggests reintroducing deductions for inter-corporate dividends, which were absent in the draft bill. This would prevent cascading taxation and support corporate investment chains.
- **Standard Deduction Reform:** A fixed 30% deduction post-municipal tax payments is proposed to simplify tax calculation for property income.
- **Pre-Construction Interest Deductions:** Currently limited to self-occupied properties, the panel recommends extending this benefit to let-out properties as well, promoting rental housing.

Taxpayer-Centric Relief Measures:

- **Nil Tax Deduction Certificates:** To reduce unnecessary deductions at source, the panel suggests streamlining the process for issuing such certificates.
- **Penalty Waivers for Non-Willful Defaults:** Greater discretion for tax officers to waive penalties for unintentional or minor non-compliances has been proposed.
- **Late Refunds for Small Taxpayers:** A provision for refunds even in cases of delayed return filing is recommended, particularly benefiting small and marginal taxpayers.

Institutional and Legal Clarity:

- **Clear Definition of NPAs:** In light of frequent conflicts between tax authorities and financial institutions, the panel calls for a precise and uniform definition of Non-Performing Assets (NPAs).
- **Clarification of 'Parent Company':** The absence of a consistent definition under capital gains provisions has led to ambiguity; the panel seeks to fill this gap for better tax compliance.
- **Non-Profit Sector Provisions:** To maintain tax exemptions for religious and charitable institutions, recommendations were made to safeguard exemptions on anonymous donations.

Towards a Self-Contained Code:

- The panel advocates eliminating residual references to the Income Tax Act of 1961 to ensure the new law functions as a complete and standalone code, reducing legal uncertainty.

10. National Cooperative Policy 2025

Context: To commemorate the UN-declared International Year of Cooperatives (IYC) 2025, India launched the National Cooperative Policy (NCP) 2025, marking a paradigm shift in the way cooperatives will contribute to inclusive development and rural prosperity over the next two decades.

About Cooperatives

- Cooperatives are voluntary, democratic, member-driven enterprises that follow the "one member, one vote" principle. India's cooperative movement, which began in the early 20th century, has grown into a mammoth network of 8.42 lakh societies and 29 crore members, contributing significantly to agriculture, dairy, and rural finance.

Key Features of National Cooperative Policy 2025

- Vision & Scope:** Anchored in "Sahkar se Samridhhi", it replaces the 2002 policy and envisions cooperative-led growth till 2045.
- Pillars of the Policy:**



- ✓ Institutional strengthening
- ✓ Inclusivity (focus on women, SC/ST, youth)
- ✓ Technological modernisation
- ✓ Diversification across 25+ sectors
- ✓ Capacity-building via Tribhuvan Sahkari University
- ✓ Global outreach through National Cooperative Export Ltd (NCEL)
- Model Cooperative Villages:** Every tehsil to host 5 such villages integrating dairy, fishery, agri-services, and tribal/women participation.
- Target:** Establish 2 lakh multipurpose PACS, increase cooperative contribution to GDP threefold, and cover 50 crore citizens.

Recent Government Initiatives

- White Revolution 2.0 to boost milk procurement
- NCOL for organic farming promotion
- PACS to undertake LPG, Jan Aushadhi, CSC, and PM Surya Ghar roles
- Onboarding of cooperatives onto the GeM portal for transparent procurement
- FFPOs & FPOs to strengthen farmer and fisher collectives

11. SC to Hear Petitions on Bihar Electoral Roll Revision

Context: The Supreme Court will hear petitions on July 10, 2025, challenging the Special Intensive Revision (SIR) of electoral rolls in Bihar, ordered by the Election Commission of India (ECI).

Key Concerns

- Large Scale:** Revision targets over 8 crore voters, with 4 crore requiring re-verification.

- **Documentation Issues:** Petitioners object to the rejection of Aadhaar and voter ID as valid proof.
- **Disenfranchisement Risk:** Limited timeframe and strict rules may exclude genuine voters.

ADR's Plea

- The Association for Democratic Reforms (ADR) warns the revision could arbitrarily disenfranchise citizens, undermining free and fair elections.

Constitutional Angle

- **Article 326:** Guarantees universal adult suffrage.
- **Article 324:** ECI must ensure fair electoral practices.
- **Judicial Oversight:** SC to decide if the process violates electoral rights.

12. Collegium System and Judicial Appointments in India

Context: The Supreme Court recently questioned the government over delays in clearing names recommended by the Collegium for appointments to various High Courts.

What is the Collegium System?

- The Collegium System is a judicial mechanism for appointing and transferring judges to the Supreme Court and High Courts.
 - ✓ It is not mentioned in the Constitution and has evolved through SC judgments (Three Judges Cases: 1981, 1993, 1998).
 - ✓ The SC Collegium includes the CJI + 4 senior-most judges.
 - ✓ The HC Collegium comprises the Chief Justice + 2 senior-most judges of that HC.

Constitutional Provisions

- Article 124(2): SC judges appointed by the President after consulting SC and HC judges.
- Article 217: HC judges appointed by the President in consultation with CJI, Governor, and HC Chief Justice.

Criticism of the Collegium System

- Lack of transparency and accountability
- Nepotism and limited diversity
- No clear criteria for selection
- Opaque transfer process
- Exclusion of the executive, weakening checks and balances

Attempts at Reform

- **National Judicial Appointments Commission (NJAC), 2014:** Declared unconstitutional by SC in 2015 for affecting judicial independence.
- **Memorandum of Procedure (MoP):** A procedure jointly developed by the executive and judiciary for appointments, yet to be finalised post-2017.

13. Supreme Court Directions on Management of DNA Evidence

Context: On July 16, 2025, the Supreme Court issued guidelines to ensure uniform handling of DNA evidence in criminal cases, aiming to strengthen the integrity and admissibility of such evidence in courts.

Issues with DNA Evidence Management in India:

- **Poor collection & preservation:** Lack of trained personnel, weak chain of custody.
- **Limited forensic capacity:** Few DNA labs, regional imbalance, and delays.
- **Absence of uniform SOPs:** Policing is a State subject under List II of the Seventh Schedule.

SC Directions:

- **Documentation:** Every DNA sample must be recorded with case details and police information.
- **Timely transport:** DNA samples must reach labs within 48 hours.
- **Chain of custody register:** Mandatory from collection till final judgment.

Legal Backing & Case Laws:

- *Kunhiraman v. Manoj* (1991): First use of DNA in a paternity case.

- Sharda v. Dharmpal (2003): DNA use in civil/matrimonial disputes upheld as not violating Article 21 or Article 20(3).
 - Criminal Procedure (Identification) Act, 2022: Allows collection of biological samples.
- Bharatiya Nagarik Suraksha Sanhita, 2023 – Sec 51: Authorizes DNA profiling during medical inspection.

14. Rajya Sabha Nominations

Context: The President of India has nominated four distinguished personalities to the Rajya Sabha: Harsh Vardhan Shringla – Former Foreign Secretary; played key roles in India’s G20 Presidency and major diplomatic initiatives.

Ujjwal Nikam – Special Public Prosecutor in landmark cases like 26/11 Mumbai attacks.

Meenakshi Jain – Historian, Padma Shri awardee, former DU professor.

C. Sadanandan Master – Teacher, columnist, and political leader from Kerala.

About Rajya Sabha

- Constitutional Provision: Article 80 – Maximum 250 members; 238 elected from states/UTs, 12 nominated by President.
- Permanent House: Not subject to dissolution; 1/3rd members retire every 2 years.
- First Constituted: 1952; names “Rajya Sabha” & “Lok Sabha” adopted in 1954.

Nominated Members (Article 80(3))

- Must have special knowledge/practical experience in literature, science, art, or social service.
- Nominated members can debate, introduce bills, and vote for Vice President but not for President.
- May join a political party within 6 months of nomination.

Election of Elected Members

- **Method:** Proportional Representation by Single Transferable Vote (STV) by elected MLAs.
- **Quota Formula:**

$$\checkmark \text{Quota} = \frac{\text{Total valid votes}}{\text{Seats to be filled} + 1} + 1$$
- Nominated MLAs/MLCs cannot vote in RS elections.

Special Powers

- Article 249 – Authorise Parliament to legislate on State List matters in national interest (2/3rd majority).
- Article 312 – Create All India Services common to Centre and States.

Role in Parliament

- Federal Chamber: Represents states’ interests at the national level.
- Revisory Role: Checks hasty legislation passed by Lok Sabha.
- Continuity: Stable forum for deliberation without electoral pressure.

INTERNATIONAL RELATIONS

1. China’s Mega Dam on Brahmaputra

Context: China has begun constructing a 60,000 MW hydropower dam on the Yarlung Zangbo (Brahmaputra) near the “Great Bend” in Tibet, close to Arunachal Pradesh.

- This project, announced in 2021, includes five cascade dams and will surpass the Three Gorges Dam in scale. The dam has triggered serious concerns in India and Bangladesh regarding its hydrological, ecological, and geopolitical impact.

India’s Key Concerns

- **Seismic & Ecological Risks:** The dam site lies in a highly active earthquake zone. Risks include landslides, flash floods, and potential mass displacement.
- **Water Weaponisation:** China may use the dam as a strategic tool to control downstream flows, impacting India’s water security during political tensions.

- **Environmental Damage:** Sudden water release or diversion could harm biodiversity, tribal livelihoods (especially in the Siang belt), and age-old flood management practices.
- **Legal Void:** China is not party to any binding international river treaty, leaving India with limited legal recourse.
- **Regional Security Threat:** The dam could disrupt irrigation, power generation, and flood regulation in India's northeast, impacting food, energy, and water security.

India's Strategic & Diplomatic Response

- **Upper Siang Multipurpose Project:** India is developing an 11.2 GW dam in Arunachal Pradesh as a strategic buffer. It will also help regulate floods and store water during emergencies.
- **River Interlinking Plans:**
 - ✓ Manas–Sankosh–Teesta–Ganga Link
 - ✓ Jogighopa–Teesta–Farakka Link

These aim to distribute Brahmaputra water to drought-prone areas via the Ganga basin.
- **Hydrological Advantage:** Though Tibet contributes only ~30–35% of Brahmaputra's flow, India provides over 80% due to rainfall and snowmelt.
- **Diplomatic Engagement:** Talks were held with China (March 2025) addressing river management and border issues. Confidence-building measures include resumption of Kailash Mansarovar Yatra and tourist visas.

Recommendations for India

- **Accelerate Dam Projects:** Expedite construction of strategic dams like Upper Siang, with adequate ecological safeguards and tribal consultations.
- **Scientific Risk Mapping:** Enhance real-time hydrological modelling, satellite monitoring, and predictive analytics to assess threats.
- **Regional Collaboration:** Partner with Bangladesh, Bhutan, and Myanmar to develop early warning systems and transboundary disaster protocols.
- **Revive Data-Sharing Agreements:** Push China to renew expired MoUs (Brahmaputra: June 2023; Sutlej: November 2020) for real-time water data.

Brahmaputra River: Key Facts

- **Origin:** Chemayungdung Glacier near Mansarovar, Tibet. Known as Yarlung Zangbo (Tibet), Siang (Arunachal), Brahmaputra (Assam), and Jamuna (Bangladesh).
- **Length:** 2,900 km (916 km in India).
- **Tributaries:**
 - ✓ Right bank: Lohit, Dibang, Subansiri, Teesta, etc.
 - ✓ Left bank: Burhidihing, Dhansiri, Kopili, etc.
- **Significance:**
 - ✓ Supports major biodiversity zones like Kaziranga and Manas.
 - ✓ Contributes 30% of India's water resources and 41% of hydropower potential.
 - ✓ Home to Majuli (world's largest river island) and Umananda (smallest).

2. Beijing Must Not Decide the Next Dalai Lama

Context: With the 14th Dalai Lama, Tenzin Gyatso, nearing his 90th birthday (July 6, 2025), the debate over the authority to determine his spiritual successor has intensified, drawing global attention to Tibet's religious autonomy and China's political interference.

Background:

- **Dalai Lama & Tibetan Buddhism:** The Dalai Lama is the highest spiritual leader in Tibetan Buddhism, traditionally chosen through a spiritual process of reincarnation.
- **Gaden Phodrang Trust:** Established by the Dalai Lama to oversee the reincarnation process, ensuring it remains free from political manipulation.

China's Position & Concerns:

- Beijing's control attempts stem from its long-standing claim over Tibet (e.g., 1959 uprising, 1995 abduction of the Panchen Lama).
- Chinese-appointed successors lack legitimacy in Tibetan spiritual traditions.

- The reincarnation process is spiritual, not subject to state authority.

India's Role:

- Historical Responsibility: India granted asylum to the Dalai Lama in 1959.
- Strategic Need: Publicly supporting Tibetan religious autonomy aligns with India's ethical values and strengthens its geopolitical stance vis-à-vis China.
- Ending "strategic ambiguity" would reaffirm India's role as a defender of cultural and religious freedoms.

3. Thailand-Cambodia Border Conflict

Context: Thailand and Cambodia have been engaged in renewed military clashes along their disputed border, particularly around ancient temple sites like Preah Vihear and Prasat Ta Muen Thom.



Cause of Conflict:

- Rooted in colonial-era border demarcations by France (1907 map), which placed the Preah Vihear Temple in Cambodian territory.
- Thailand disputes the map and claims surrounding areas.
- ICJ ruled in Cambodia's favour in 1962 and reaffirmed in 2013, but Thailand disputes adjacent land rights.

Recent Developments:

- Violent clashes in July 2025 led to 38 deaths and displacement of nearly 3 lakh people.
- On July 29, both countries agreed to an unconditional ceasefire.
- Talks planned via a cross-border committee on August 4 in Cambodia.

International Involvement:

- The U.S. and China facilitated peace talks.
- UN urged both nations to maintain the truce.
- ASEAN may play a mediating role.

4. India-UK Relations

Context: As India and the UK prepare to sign the Comprehensive Economic Trade Agreement (CETA), their bilateral relationship is poised to enter a transformative phase. The partnership now encompasses trade, technology, defence, climate action, and people-to-people ties, with Global Capability Centres (GCCs) emerging as a key area of convergence.

What are Global Capability Centres (GCCs)?

- GCCs are offshore units set up by global companies to handle high-value functions such as:
 - ✓ Early 2000s: Cost-saving back-office work (IT, payroll, customer support)

✓ Mid-2010s: Efficiency-driven tasks (software dev, analytics)

✓ Now: Innovation hubs (AI, cybersecurity, R&D)

- India hosts over 1,500 GCCs employing 1.9 million+ skilled professionals, becoming a global hub for digital transformation.

How UK-India FTA Boosts GCCs

- Simplifies regulations to ease business operations
- Facilitates skilled migration, aiding tech and innovation exchange
- Aligns digital and data privacy norms, enabling seamless cross-border data flows

Benefits for Both Countries

- UK gains: Access to India's vast digital market and innovation ecosystem
- India gains: Increased UK investments, tech collaborations, and job creation

India's Policy Push for GCCs

- MeitY-led panel to create a national framework for GCCs (Budget 2025)
- State-level efforts like UP's GCC Conclave promote infrastructure and incentives

Comparative Edge of Indian GCCs

- Larger skilled, English-speaking workforce
- Strong IT infrastructure and innovation focus
- Compared to Philippines (BPO-focused), Eastern Europe (talent but smaller scale), and Latin America (regional focus), India leads in high-end, diverse capabilities

Key Areas of India-UK Convergence

- **Trade:** Bilateral trade at \$21.34 bn (2023-24); FTA to eliminate tariffs on 99% of Indian exports
- **Technology:** Joint focus on AI, semiconductors, cybersecurity
- **Defence:** Cooperation in Indo-Pacific; 2+2 dialogue and tech transfers
- **Climate:** Collaboration on green hydrogen, renewables
- **Education & Diaspora:** Over 1.6 million Indian diaspora; rise in academic exchanges and campuses

Key Areas of Friction

- Migration/Visa issues: UK's post-Brexit visa policy vs. India's demand for easier skilled mobility
- Extradition delays: E.g., Vijay Mallya case
- Russia-Ukraine war: India's neutrality vs. UK's strong pro-Ukraine stance
- Trade barriers: High Indian tariffs on UK goods like whisky, cars
- CBAM: UK's carbon tax seen as green protectionism by India
- Extremism: Khalistani activities in UK strain ties

Role of GCCs in Bilateral Growth

- Catalyse trade by offering cost-effective services to UK firms
- Enable knowledge transfer in tech and innovation
- Create jobs and upskill workforce
- Drive R&D collaboration in pharma, clean energy, and engineering

5. India-U.S. Strategic Partnership under Strain

Context: India-U.S. relations, often described as a defining partnership of the 21st century, are witnessing turbulence in recent times. Despite robust cooperation in defence, technology, space, energy, and trade, recent political developments, especially under the Trump administration, have introduced a new layer of complexity and mistrust.

Key Developments

• Trump Administration's Hostile Turn

- ✓ U.S. President Donald Trump's tariff hikes (25%) and additional penalties on India's trade with Russia marked a significant departure from previous diplomatic warmth.
- ✓ A 12-hour social media tirade against India's strategic and trade decisions raised alarm bells in New Delhi.
- ✓ Simultaneous outreach to Pakistan, including defence ties and economic deals, deepened India's apprehensions.

- **Structural Divergences**
 - ✓ Strategic Autonomy vs. Strategic Expectations: India's "India First" policy, driven by non-alignment and sovereignty concerns, clashes with U.S. expectations of alignment on global issues.
 - ✓ Russia-Iran Ties: India's engagement with Russia and Iran remains a sticking point, while the U.S. continues relations with Pakistan and other regional players.
 - ✓ Trade Protectionism: India's focus on domestic manufacturing and reduced foreign access, including high import tariffs, has become a sore point in bilateral trade talks.
- **Geopolitical Mistrust**
 - ✓ The U.S. increasingly perceives India's assertive foreign policy and military responses to terrorism as potential triggers for instability.
 - ✓ India's balancing act between groupings like BRICS and Quad, and its nuanced stance on the Russia-Ukraine conflict, are viewed with suspicion by American strategic circles.
 - ✓ There is a growing narrative in the U.S. labeling India's global aspirations as "delusional", reflecting strategic asymmetry.

Recent Flashpoints

- U.S.-Pakistan Engagement: Trump hosting Pakistan's Army Chief and announcing energy collaboration with Islamabad aggravated India's concerns.
- India's Response to U.S. Mediation Offers: India strongly refuted Trump's claim of being asked to mediate in the Kashmir issue, possibly leading to diplomatic embarrassment for the U.S. President.

Implications for India-U.S. Relations

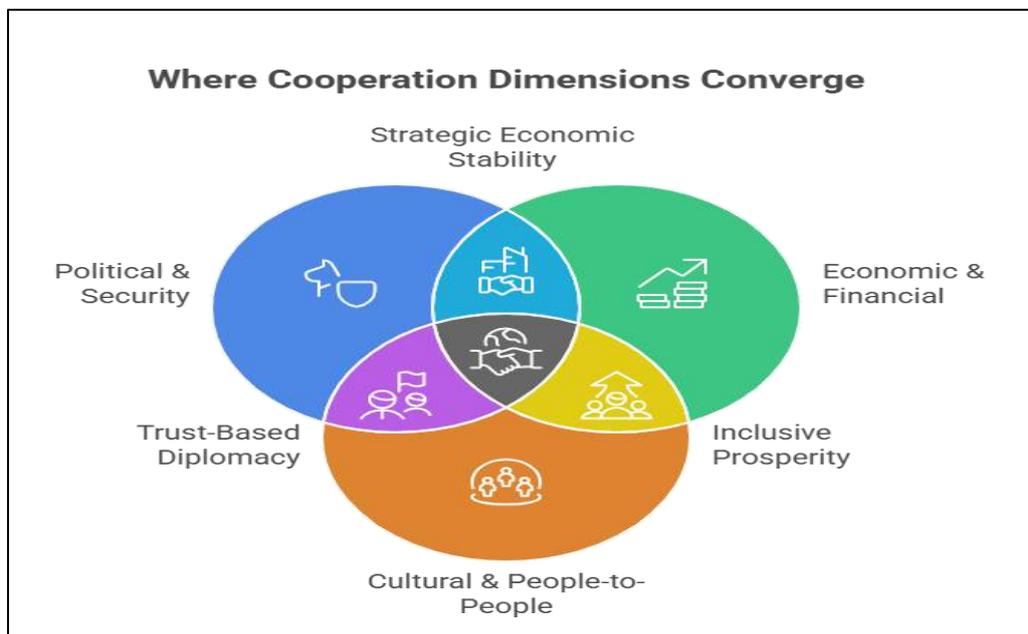
Aspect	Risk/Challenge
Strategic Partnership	Risk of rollback in two decades of progress, including civil nuclear cooperation and defence ties
Economic Relations	Trade ties strained due to protectionism and tariffs
Geopolitical Coordination	Divergence on global issues like Russia-Ukraine and Iran

6. 17th BRICS Summit 2025

Context: The 17th BRICS Summit 2025, held in Rio de Janeiro, Brazil on 6–7 July, took place amid shifting global geopolitics and growing multipolarity. The summit's theme, "Strengthening Global South Cooperation for a More Inclusive and Sustainable Governance", culminated in the adoption of the Rio de Janeiro Declaration.

Major Highlights

- **Strategic Vision:** Reaffirmed BRICS spirit of mutual respect, sovereign equality, democracy, and inclusiveness; called for reforms in UN, Bretton Woods institutions, and greater voice for Global South.
- **Three Pillars of Cooperation:**



- ✓ Political & security
- ✓ Economic & financial
- ✓ Cultural & people-to-people

- **Membership Expansion**

- ✓ **New Member:** Indonesia joined as full member.
- ✓ **11 New Partners:** Belarus, Bolivia, Kazakhstan, Cuba, Nigeria, Malaysia, Thailand, Vietnam, Uganda, Uzbekistan.
- ✓ **NDB Update:** Colombia and Uzbekistan admitted as borrowing members.

- **Key Declarations & Initiatives**

- **Climate Finance Framework:** Ensuring accessible and affordable climate finance, enabling just transition.
- **AI Governance Statement:** Promoting responsible AI development in line with national laws and UN Charter.
- **Health Partnership:** Tackling socially determined diseases linked to poverty and exclusion.

- **Focus Areas**

- **Multilateralism:** Support for Pact for the Future, Global Digital Compact, and equitable representation in global institutions.
- **Peace & Security:** Opposition to securitizing climate change; emphasis on African-led conflict resolution.
- **Economic Cooperation:** Progress on BRICS Economic Partnership Strategy 2025, roadmap for 2030 on digital economy, trade, investment, and sustainability.
- **Climate Goals:** Endorsed Paris Agreement principles (CBDR); backed India's bid for COP-33 in 2028.
- **Social Development:** Women & youth empowerment, inclusion of persons with disabilities, and effective migration management.

- **India's Role**

- Will assume BRICS presidency in 2026 with focus on Building, Resilience, Innovation, Cooperation, and Sustainability.
- Advocated de-dollarization alternatives, equitable climate finance, and reforms in global governance.
- Rejected Yuan settlement for Russian oil, signalling resistance to Chinese currency dominance.

- **Geopolitical Context**

- BRICS now represents ~45% of global population and ~35% of world GDP.
- US expressed concerns over currency alternatives; former President Trump threatened tariffs on BRICS nations pursuing de-dollarization.

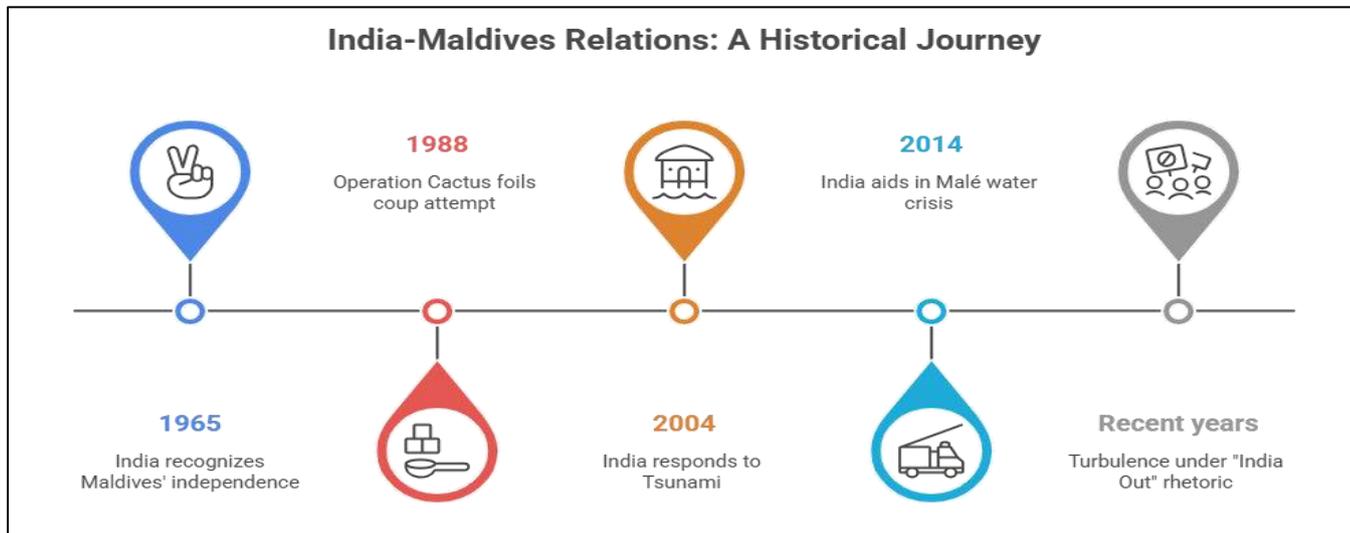
7. India-Maldives Relations

Context: PM Modi's 2025 visit to Maldives marked a reset in ties with the signing of 8 bilateral agreements, including UPI integration, debt relief, fisheries cooperation, housing projects, and a ₹4,850 crore Line of Credit.

Strategic Importance:

- Maldives' location astride key Indian Ocean shipping lanes makes it central to India's Neighbourhood First and SAGAR policies.
- Acts as a maritime security pivot in the Indo-Pacific.

Historical Evolution:



- 1965: India among first to recognise Maldives' independence.
- 1988: Operation Cactus foiled a coup, cementing trust.
- 2004 Tsunami, 2014 Malé water crisis, COVID-19 — India acted as first responder.
- Recent years saw turbulence under "India Out" rhetoric and growing Chinese influence.

Key Areas of Cooperation:

- Defence & Security: Joint exercises (Ekuverin, Dosti), MNDF training, radar systems, HADR support.
- Development Assistance: Greater Malé Connectivity Project, housing units, community projects.
- Trade & Economy: India largest trading partner; new fintech linkages via UPI/RuPay.
- Tourism & Culture: India top tourist source (2020–23); cultural and education exchanges.
- Climate Action: Renewable energy, disaster resilience, blue economy cooperation.

Major Irritants:

- Rising Chinese footprint through BRI projects and debt diplomacy.
- Sovereignty concerns over Indian military presence.
- Tourism decline after anti-India rhetoric.
- Fishing rights disputes and project delays.

Way Forward:

- Recast defence cooperation with civilian-led maritime capacity building.
- Jointly owned infrastructure and blue economy projects.
- Cultural diplomacy and youth engagement to rebuild trust.
- Institutionalised strategic dialogue to insulate ties from political shifts.
- Debt sustainability mechanisms and climate-resilient development.

8. India & the Global South

Context: PM Modi's July 2025, five-nation tour to Ghana, Trinidad & Tobago, Argentina, Brazil, and Namibia reflects India's strategic push to deepen ties with the Global South, enhance resource security, and advance global governance reforms.

What is the Global South?

- A collective of developing and emerging nations across Asia, Africa, Latin America, and Oceania, united by shared developmental challenges and limited voice in global decision-making. Platforms include G77, NAM, and Voice of the Global South Summits.
- **Key Challenges:** Climate vulnerability, debt distress, strategic resource dependence, digital divide, and under-representation in bodies like UNSC, IMF, WTO.

Highlights of PM's Visit:

- **Ghana:** First PM visit in 30 years; focus on gold trade, energy, defence, and maritime security.
- **Trinidad & Tobago:** Strengthening cultural diplomacy with a large diaspora; boosting trade and cooperation.
- **Argentina:** Expanding lithium partnership for clean energy transition; defence and agriculture cooperation.
- **Brazil:** Attending BRICS Summit on "Strengthening Global South Cooperation"; discussions on multilateral reforms, AI regulation, climate action.
- **Namibia:** Expanding mining and biofuel ties; fintech collaboration via UPI; follow-up on wildlife cooperation.

India's Role in the Global South:

- **Diplomatic Leadership:** Hosting Voice of the Global South Summits; backing African Union's G20 entry.
- **Economic & Tech Cooperation:** Exporting digital public infrastructure (UPI, telemedicine); financing climate-resilient projects.
- **Strategic Autonomy:** Balancing ties with major powers while championing Southern priorities.

Way Forward:

- Institutionalise a permanent Global South forum.
- Lead UNSC, WTO, IMF reforms.
- Secure equitable access to critical minerals.
- Expand South-South finance through BRICS Bank and ISA.

9. India-EFTA Trade and Economic Partnership Agreement (TEPA)

Context: TEPA, signed in March 2024, will come into force on 1 October 2025, marking a major trade pact between India and the European Free Trade Association (EFTA) – Switzerland, Iceland, Norway, and Liechtenstein.

About EFTA:

- Inter-governmental body promoting free trade and economic integration.
- Established by the Stockholm Convention (1960); current members are not part of the EU.

Key Features of TEPA:

- **First Binding FTA Commitment:** EFTA to invest \$100 bn FDI in India over 15 years, generating 1 million direct jobs.
- **Market Access:**
 - ✓ **EFTA:** 100% coverage for non-agri goods; tariff cuts on processed agri products.
 - ✓ **India:** Tariff cuts on products like Swiss watches, chocolates, cut & polished diamonds; dairy, soya, coal, and sensitive farm goods excluded.
- **Tariff Reductions:**
 - ✓ **EFTA:** Remove/reduce tariffs on 99.6% of Indian exports.
 - ✓ **India:** Remove/reduce tariffs on 95.3% of EFTA exports.
- **Other Provisions:** IPR protection, Mutual Recognition Agreements in professional services (e.g., nursing).

India-EFTA Trade (2024-25):

- Bilateral trade: \$24.4 bn.
- Trade deficit in India's favour mainly due to large gold imports from Switzerland.
- Switzerland is India's largest EFTA trading partner, followed by Norway.

Significance:

- Boosts market access for Indian goods in high-income EFTA economies.

- Strengthens investment inflows and job creation.
- Supports diversification of India's trade partners beyond traditional markets.

10. US Withdrawal from UNESCO

Context: The United States has announced its third withdrawal from the United Nations Educational, Scientific and Cultural Organization (UNESCO), effective December 31, 2026, citing alleged anti-Israel bias and political disagreements. The US had rejoined in 2023 after exiting in 2017.

About UNESCO

- Founded: 16 November 1945; HQ: Paris
- Members: 194 Member States + 12 Associate Members
- Mandate: Promote peace via cooperation in education, science, and culture; safeguard heritage; promote sustainable development; foster tolerance.
- India: Founding member, party to 19 UNESCO conventions, 44 World Heritage Sites, and host to UNESCO MGIEP in New Delhi.

History of US Exits

- 1984 (Reagan): Alleged mismanagement, pro-Soviet tilt.
- 2017 (Trump-1): Cited anti-Israel bias post-Palestine's admission in 2011.
- 2025 (Trump-2): Cited political and ideological disagreements.

Implications of US Exit

- **Global:**
 - ✓ Funding shortfall (~8% of UNESCO budget).
 - ✓ Risk of increased Chinese influence on UNESCO's agenda.
 - ✓ Weakening of global cooperation in AI ethics, climate science, girls' education.
- **For India:**
 - ✓ Opportunities: Greater role in shaping global cultural/educational agenda; promoting South-South cooperation; more heritage site recognitions.
 - ✓ Challenges: Funding cuts affecting Indian heritage projects; balancing rising Chinese influence.

Way Forward

- Reduce geopolitical interference in UNESCO's functioning.
- Diversify funding and strengthen regional cooperation.
- Focus on emerging challenges like AI ethics, digital learning, climate education.

Economic Scenario

1. State of Inequality in India

Context: The World Bank's Poverty and Equity Brief claims India's Gini coefficient of consumption inequality fell from 0.288 (2011–12) to 0.255 (2022–23) — among the lowest globally. However, multiple sources, including the World Inequality Database (WID), indicate rising income and wealth inequality.

Types of Inequality

- **Consumption Inequality:**
 - ✓ Based on household spending.
 - ✓ Lower Gini may reflect consumption smoothing, not genuine redistribution.
- **Income Inequality:**
 - ✓ WID 2023 Gini: 0.61 — among the highest globally.
 - ✓ Household surveys often underreport high incomes.
- **Wealth Inequality:**
 - ✓ WID 2023 Gini: 0.75 — extreme wealth concentration.
 - ✓ No official wealth census; estimates rely on proxies (e.g., Forbes, SEBI data).

Data Limitations

- Surveys miss top earners ("differential non-response").
- Consumption surveys differ across years, limiting comparability.

- Tax data incomplete — only ~6 crore file returns.
- Gini hides extremes; better indicators: Top 1% share, P90/P10 ratio, Palma ratio, Theil index.

Implications of High Inequality

- Economic: Depressed demand, skewed growth benefits to top 10%.
- Social: Reduced mobility, political polarisation, unrest.
- Policy: Elite capture of taxation, subsidies, and land use.

Constitutional Backdrop

- Art. 38(2): Minimise income and opportunity inequality.
- Art. 39(c): Prevent wealth concentration.
- Schemes: MGNREGA, PM-KISAN, JAM Trinity — face targeting and leakage issues.

Way Forward

- Progressive taxation: Wealth/inheritance tax on ultra-rich.
- Public provisioning: Universal health, education, nutrition.
- Financial inclusion: Affordable credit with safeguards.
- Job creation: Skilling for market demand, labour-intensive sectors.
- Better metrics: Integrate tax, survey, and asset data for true inequality mapping.

2. National Turmeric Board

Context: The National Turmeric Board, notified in October 2023, was formally inaugurated in January 2025 with its headquarters in Nizamabad, Telangana to strengthen India's turmeric sector and enhance its global trade footprint.

About the Board

- Ministry: Commerce & Industry.
- Aim: Leadership, coordination, and development of the turmeric value chain in synergy with the Spices Board and other agencies.
- **Composition:**
 - ✓ Chairperson (appointed by Centre).
 - ✓ Members from Ministry of AYUSH, Pharmaceuticals, Agriculture, State representatives (3 on rotation), research institutions, farmer & exporter representatives.
 - ✓ Secretary appointed by Department of Commerce.
- **Functions:**
 - ✓ Promote R&D, value addition, and exports.
 - ✓ Awareness of turmeric's benefits.
 - ✓ Improve yields & supply chains to expand domestic & global markets.

Turmeric in India

- Status: Largest producer, consumer, and exporter — 70% of global production.
- Cultivation: 30+ varieties across 20+ states; key producers — Telangana, Maharashtra, Tamil Nadu, Andhra Pradesh (63.4% share).
- Exports: Over 62% share in global trade; key markets — Bangladesh, UAE, USA, Malaysia.
- GI Tags: Sangli & Waigaon (Maharashtra), Erode Manjal (Tamil Nadu), Lakadong (Meghalaya).

Agro-Climatic Requirements

- Crop type: Rhizome ("Golden Spice").
- Climate: Tropical; 20–30°C temperature; ≥1500 mm annual rainfall.
- Soil: Well-drained sandy/clay loam.

Health Benefits

- Rich in antioxidant & anti-inflammatory compounds; widely used in medicine, cuisine, and wellness products.

3. National Sample Survey (NSS) – 75 Years of Service

Context: The National Sample Survey (NSS), established in 1950 by P.C. Mahalanobis, has completed 75 years of providing reliable socio-economic data through large-scale sample surveys based on random sampling.

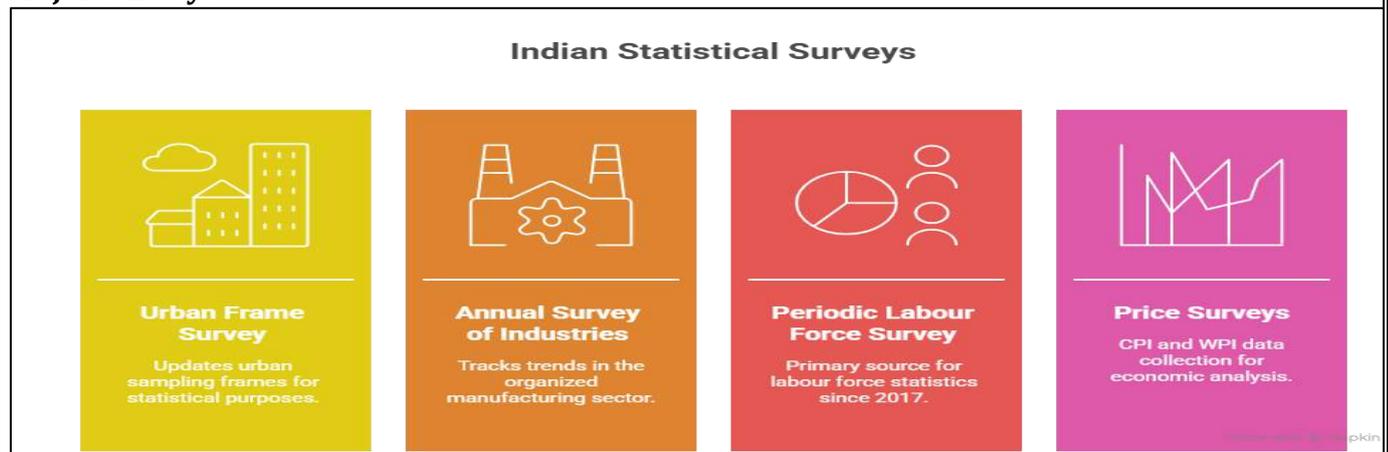
About NSS

- **Ministry:** Statistics & Programme Implementation (MoSPI).
- **Head:** Director General.
- **Scope:**
 - ✓ Household surveys: Population, migration, fertility, family planning, etc.
 - ✓ Agriculture & livestock surveys.
 - ✓ Establishment & enterprise surveys (unorganized sector, rural retail prices).
 - ✓ Village-level surveys on infrastructure.

Organisational Structure

- Survey Design & Research Division (SDRD) – Kolkata; survey planning, concepts, sampling.
- Field Operations Division (FOD) – Delhi/Faridabad; primary data collection.
- Data Processing Division (DPD) – Kolkata; sample selection, software, validation, tabulation.
- Survey Coordination Division (SCD) – New Delhi; inter-division coordination.

Major Surveys



- Urban Frame Survey (2022–27): Updates urban sampling frames.
- Annual Survey of Industries (ASI): Tracks organized manufacturing sector trends.
- Periodic Labour Force Survey (PLFS): Since 2017, primary labour force statistics source.
- Price Surveys: CPI (Urban/Rural), CPI (Agricultural/Rural Labourers), WPI.

4. Strengthening India's Chemical Industry

Context: NITI Aayog's report "Chemical Industry: Powering India's Participation in Global Value Chains" outlines a roadmap for India to achieve a 12% share in global chemical value chains and USD 1 trillion output by 2040.

Status & Significance

- Global Rank: 6th largest chemical producer; >7% of manufacturing GDP.
- Key Links: Supports pharma, textiles, agriculture, construction.
- Current Share in GVC: 3.5% with USD 31 billion trade deficit (2023).
- Geographic Concentration: Majorly in Gujarat, Maharashtra, Tamil Nadu.

Key Challenges

- Import dependence for feedstock & APIs (over 60% from China, Gulf).
- Low R&D investment (0.7% vs global avg 2.3%).
- 30% skilled workforce shortage.
- Regulatory delays (12–18 months for clearances).
- Infrastructure & logistics bottlenecks.

Opportunities

- Rising demand in agrochemicals, pharma, construction, automotive.
- Global supply chain diversification away from China.
- Growth in green & bio-based chemicals (bio-plastics, bio-lubricants).
- Potential job creation: 7 lakh skilled jobs by 2030.

NITI Aayog's Recommendations

- Chemical Hubs & Port Clusters – with Viability Gap Funding.
- OPEX Subsidy – for import-reduction & export-focused chemicals.
- R&D Push – industry-academia collaboration, tech partnerships.
- Regulatory Reform – fast-track environmental clearances.
- Trade Policy – targeted FTAs, tariff quotas for critical inputs.
- Skill Development – petrochemicals, polymer science, process safety.

Government Initiatives

- PLI Scheme for KSMs, Drug Intermediates, APIs.
- PCPIR at Paradip attracting USD 8.84 billion investment.
- Jan Aushadhi Kendras expansion for affordable medicines.

5. Biostimulants in India – Benefits, Market Growth & Regulation

Context: Union Agriculture Minister has urged states to stop the forced sale of biostimulants or nano-fertilisers with subsidised fertilisers (urea, DAP) after farmer complaints of inefficacy.

What are Biostimulants?

- Substances/microorganisms that enhance plant growth, yield, nutrient uptake, and stress tolerance.
- Made from plant waste, seaweed extracts, bio-chemicals, vitamins, or antioxidants.
- Not fertilisers or pesticides — defined under Fertiliser Control Order (FCO) 1985.

Key Benefits

- Stress tolerance – resilience to drought/heat.
- Better crop quality – improved grain fill, fruit colour, post-harvest life.
- Growth promotion – root & leaf development, higher yield.
- Soil health – boosts microbes, long-term fertility.

Fertilisers vs Biostimulants

Aspect	Fertilisers	Biostimulants
Function	Supply nutrients (NPK)	Aid nutrient uptake & plant processes
Regulation	Nutrient content-based	Function-based
Environmental Impact	Risk of pollution	Eco-friendly, reduces fertiliser use

Market Status

- Valued at USD 355.53 mn (2024) → projected USD 1,135.96 mn by 2032 (CAGR 15.64%).
- Earlier: ~30,000 unregulated products; post-2025 checks reduced to ~650.

Regulatory Timeline

- Pre-2011: Not covered under fertiliser/pesticide laws.
- 2011: Punjab & Haryana HC – state scrutiny for such products.
- 2017: Draft regulatory framework by NITI Aayog & Agriculture Ministry.
- Feb 2021: FCO amendment – biostimulants brought under regulation.

FCO Guidelines (2021)

- 8 categories (botanical extracts, seaweed, bio-chemicals, vitamins, etc.).
- Mandatory tests: 5 acute toxicity (rats, rabbits) + 4 eco-toxicity (birds, fish, bees, earthworms).
- Pesticide residue limit: ≤0.01 ppm.
- Efficacy trials in 3 agro-ecological zones for 1 season.
- Central Biostimulant Committee – sets standards, protocols, approvals

6. Aluminium & Copper Vision Documents

Context: The Union Coal & Mines Minister unveiled the Aluminium Vision Document and Copper Vision Document at the International Conference on Sustainable and Responsible Mining (Hyderabad, 2025). These aim to ensure raw material security, meet growing demand, and position India as a global production hub by 2047.

Aluminium Vision Document

- **Aim:** Six-fold rise in aluminium production by 2047; make India a leader in green aluminium.
- **Bauxite Target:** Expand production to 150 MTPA for raw material security.
- **Sustainability:** Promote low-carbon, energy-efficient tech; double recycling rates to cut dependence on primary ores.
- **Reforms:** Faster mining approvals, project clearances, and better resource governance.
- **Strategic Importance:** Critical for clean energy (solar, wind), EVs, defence, and infrastructure.

India & World Status:

- **Reserves:** Odisha (41%), Chhattisgarh, Andhra Pradesh.
- **Production:** Odisha (73%).
- **Global Leader:** China (58%), followed by Australia, Brazil, India.

Copper Vision Document

- **Aim:** Meet six-fold rise in demand by 2047.
- **Capacity Goal:** Add 5 MTPA smelting & refining by 2030.
- **Strategic Role:** Key for energy transition, infrastructure, EVs, solar power.

India & World Status:

- **Reserves:** Rajasthan (52.25%), Madhya Pradesh, Jharkhand.
- **Production:** MP (57%), Rajasthan (43%).
- **Global Leader:** Chile (19% reserves), Peru & Australia (10% each).

Significance of Vision Documents:

- Supports Atmanirbhar Bharat by reducing import dependence.
- Boosts industrial output, exports, and employment.
- Advances India's decarbonisation and green economy goals.
- Encourages R&D and technological modernisation in mining and metallurgy.

7. Prime Minister Dhan-Dhaanya Krishi Yojana (PMDDKY)

Context: The Union Cabinet has approved PMDDKY, a flagship scheme announced in Union Budget 2025–26, with an annual outlay of ₹24,000 crore for six years. It aims to transform agriculture in 100 underperforming districts, inspired by the Aspirational Districts Programme.

Objectives

- Reduce disparities in agricultural productivity across regions.
- Promote crop diversification, sustainable practices, and value addition in agriculture & allied sectors.
- Enhance post-harvest storage, irrigation, and access to credit.
- Support Atmanirbhar Bharat by improving domestic production of food grains, oilseeds, and pulses.

Key Features

- **Convergence Model:** Merges 36 schemes across 11 ministries/departments with state schemes and private sector partnerships.
- **District Selection:** Based on low productivity, low cropping intensity, and limited credit disbursement.
- **Balanced Representation:** At least one district from each state/UT; allocation proportionate to net cropped area and operational holdings.
- **Beneficiaries:** Expected to directly benefit 1.7 crore farmers.

Implementation

- **District Agriculture & Allied Activities Plan:** Prepared by District Dhan Dhaanya Samiti with farmer participation, aligned to national priorities (soil & water conservation, organic/natural farming).
- **Monitoring:** 117 Key Performance Indicators tracked monthly via dashboard; Central Nodal Officers and NITI Aayog to oversee progress.
- **Committees** at district, state, and national levels to ensure coordination and accountability.

Expected Outcomes

- Higher crop yields and farm incomes.

- Strengthened rural livelihoods through integration of livestock, dairy, and fisheries.
- Improved resilience of agri-economy through better infrastructure and credit access.

Link with Aspirational Districts Programme

- ADP Launched: 2018, targeting 112 underdeveloped districts.
- Approach: 3Cs – Convergence, Collaboration, Competition; progress tracked via delta ranking.
- Success Stories: Districts like Chamba (HP) achieving 100% clean tap water and full financial inclusion.

8. ADEETIE Scheme

Context: The Ministry of Power, through the Bureau of Energy Efficiency (BEE), has launched the ADEETIE Scheme to promote energy efficiency in MSMEs and support India's climate and competitiveness goals.

About the Scheme:

- Objective: Accelerate adoption of advanced energy-efficient technologies in MSMEs to reduce energy use (30–50%), improve productivity, and contribute to green energy corridors.
- Duration: 3 years (FY 2025-26 to 2027-28).
- Coverage: 14 energy-intensive sectors (e.g., chemicals, food processing, brass, ceramics, textiles).
- Eligibility: Udyam-registered MSMEs with minimum 10% projected energy savings.
- Implementation: Bureau of Energy Efficiency (BEE) in phased manner – 60 industrial clusters in phase 1, 100 clusters in phase 2.

Key Features:

- Interest Subvention: 5% for Micro & Small Enterprises, 3% for Medium Enterprises on loans for energy-efficient tech adoption.
- Technical Support: Investment Grade Energy Audits (IGEA), Detailed Project Reports (DPRs), Monitoring & Verification (M&V).
- ADEETIE Portal: Facilitates financing and project tracking.

About BEE:

- Established in 2002 under the Energy Conservation Act, 2001.
- Mandate: Develop policies and strategies to reduce energy intensity in the economy.
- Other MSME-focused initiatives: BEE–SME Programme, SIDHIEE Portal.

Significance:

- Enhances MSME competitiveness and cost-efficiency.
- Supports India's net-zero targets and sustainable industrial growth.
- Strengthens green financing ecosystem in the MSME sector.

GEOGRAPHY, ENVIRONMENT & DISASTER MANAGEMENT

1. MoEFCC Releases Draft Emission Intensity Target Rules Under Carbon Credit Trading Scheme (CCTS)

Context: The Ministry of Environment, Forest and Climate Change (MoEFCC) has released the Draft Greenhouse Gas (GHG) Emission Intensity Target Rules, 2025, as part of India's evolving carbon market framework under the Carbon Credit Trading Scheme (CCTS).

Key Features of the Draft Rules:

- **Definition of Emission Intensity:** Emission Intensity is defined as the tonnes of CO₂ equivalent released per unit of output or product.
- **Scope and Coverage:** The draft proposes legally binding emission targets for over 400 industrial units, covering sectors such as:
 - ✓ Aluminium
 - ✓ Iron and Steel
 - ✓ Petroleum Refining
 - ✓ Petrochemicals

✓ Textiles

- **Target Setting Authority:** The Bureau of Energy Efficiency (BEE) is empowered to determine sector-wise emission targets.
- **Legal Enforcement:** Non-compliance may attract penal provisions under the Environment (Protection) Act, 1986.

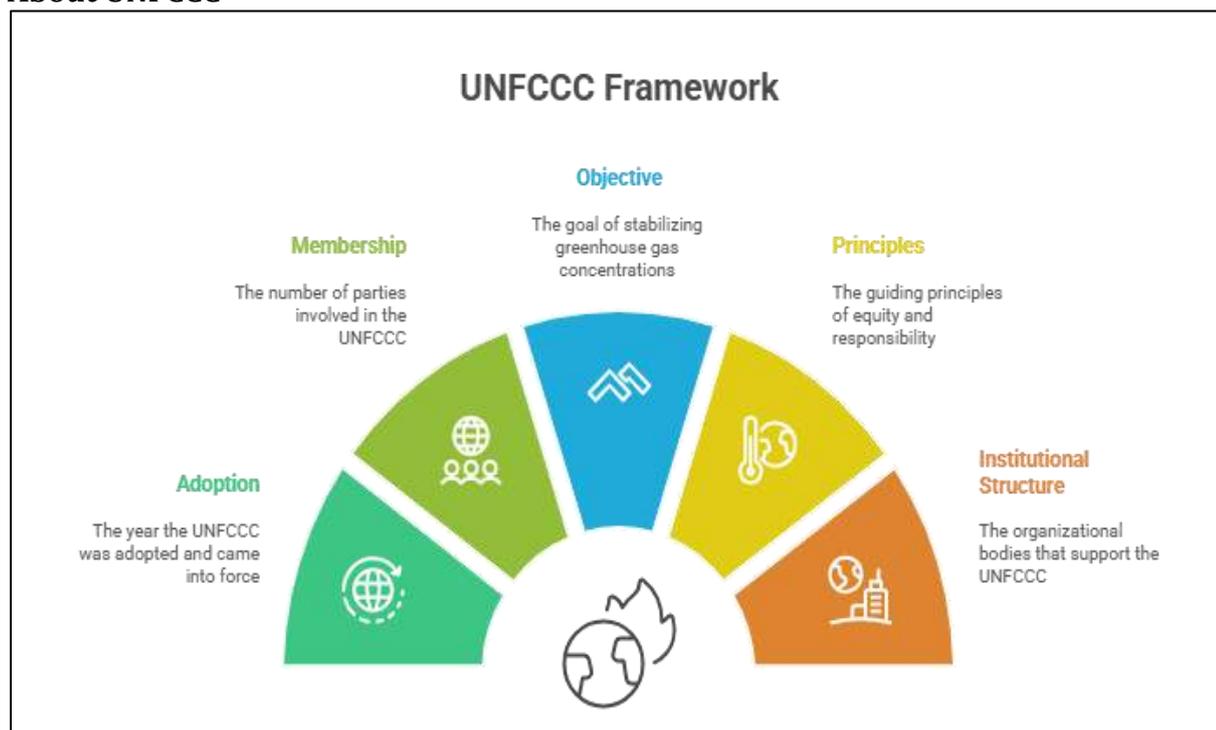
About Carbon Credit Trading Scheme (CCTS):

- **Legal Basis:** The Energy Conservation (Amendment) Act, 2022 empowers the Central Government, in consultation with BEE, to notify and implement the CCTS.
- **Mechanism:**
 - ✓ **Compliance Framework:** Entities with emissions below their assigned targets will receive Carbon Credit Certificates.
 - ✓ **Voluntary Offset Option:** Other sectors can register emission reduction or avoidance projects to earn tradable carbon credits.
- **Institutional Framework:**
 - ✓ Administrator: Bureau of Energy Efficiency (BEE)
 - ✓ Regulator: Central Electricity Regulatory Commission (CERC)

2. Reforming the UNFCCC Process

Context: Amid escalating climate crises, the United Nations Framework Convention on Climate Change (UNFCCC) is facing a credibility challenge due to slow progress, unmet finance pledges, and procedural inefficiencies. Reform discussions have intensified ahead of COP-30 in Brazil (2025).

About UNFCCC



- Adopted: 1992 Rio Earth Summit; in force from 1994.
- Members: 198 Parties.
- Objective: Stabilize GHG concentrations to prevent dangerous climate change.
- Principles:
 - ✓ Common but Differentiated Responsibilities (CBDR)
 - ✓ Equity
- Institutional Structure:
 - ✓ COP – Supreme decision-making body.
 - ✓ SBSTA & SBI – Subsidiary bodies for advice & implementation.
 - ✓ Secretariat – Bonn, Germany.

India & UNFCCC – Key Highlights

- Updated NDCs (2022) reflecting Panchamrit goals:
 - ✓ 45% emission intensity cut (2005–2030)
 - ✓ 50% power capacity from non-fossils by 2030
 - ✓ Net-zero by 2070
- Initiatives: Mission LiFE, LT-LEDS, Green Credit Programme, Global Biofuel Alliance.
- Achievements: 36% cut in emission intensity since 2005; forest/tree cover offsets 22% of CO₂ emissions.

Why Reform is Urgent

- Rising Emissions: Despite decades of talks, 1.5°C target is slipping.
- Voluntary & Weak Commitments: NDCs are non-binding; only 11% of nations submitted 2035 plans by May 2025.
- Consensus Paralysis: Every country has veto power, leading to diluted agreements.
- Climate Justice Deficit: SIDS & LDCs face disproportionate impacts; finance & adaptation underfunded.
- Finance Gap: \$100 bn annual pledge vs. \$1.3 tn actual need; new \$300 bn/year (from 2035) deemed inadequate.
- Fossil Fuel Influence: Hosting COPs in oil-dependent states raises conflict-of-interest concerns.
- Weak Accountability: No penalties for non-compliance; Loss & Damage Fund underfunded.

Proposed Reforms

- **Structural Changes**
 - ✓ Shift to majority-based voting when consensus fails.
 - ✓ Streamline agendas, cap delegation sizes, and limit speaking time.
 - ✓ Independent technical review of NDCs to enhance accountability.
- **Finance Reforms**
 - ✓ Link climate finance disbursement to transparent reporting & measurable results.
 - ✓ Increase adaptation funding and ensure predictable finance flows.
- **Inclusivity & Justice**
 - ✓ Prioritize needs of vulnerable nations in decision-making.
 - ✓ Limit fossil fuel industry influence in negotiations.
 - ✓ Exclude poor-performing nations from hosting COPs.
- **Integrated Action**
 - ✓ Mainstream climate negotiations into other UN bodies & finance institutions.
 - ✓ Reframe climate action around human needs—housing, food, health, mobility—integrating development and climate goals.

3. India Opposes Amendments to the Plant Treaty

Context: At the 10th session of the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) in Peru (July 2025), India strongly objected to proposed amendments expanding the treaty's scope, citing risks to seed sovereignty, farmers' rights, and national control over genetic resources.

About the Plant Treaty (ITPGRFA)

- Adopted: 2001 under FAO; in force since 2004.
- India: Ratified in 2002.
- **Objectives:**
 - ✓ Conserve and sustainably use plant genetic resources.
 - ✓ Ensure equitable benefit-sharing.
 - ✓ Strengthen food security and agrobiodiversity.
- **Key Provisions:**
 - ✓ Multilateral System (MLS): Facilitates access to 64 listed food and forage crops (Annex I).
 - ✓ Standard Material Transfer Agreement (SMTA): Legal tool for access and exchange.
 - ✓ Farmers' Rights: Save, exchange, and sell seeds; recognition of indigenous knowledge.
 - ✓ Global Information System: Data sharing on genetic resources.

Proposed Amendments & Concerns

- **Proposal:** Expand Annex I to cover all Plant Genetic Resources for Food and Agriculture (PGRFA) under a uniform SMTA.
- **Concerns:**
 - ✓ Loss of sovereign control over indigenous germplasm.
 - ✓ Dilution of farmers' traditional seed-saving rights.
 - ✓ Reduced ability to set national access conditions.
 - ✓ Potential free access for foreign entities without proportional benefit-sharing.

Institutional & Federal Issues

- ICAR assured protection of national interests; Indian delegate co-chairs negotiations.
- Kerala Government: Raised federal concerns—agriculture is a State subject; lack of consultation with States and farmers' bodies undermines constitutional principles.
- Risk of sidelining State Biodiversity Boards in regulating local resources.

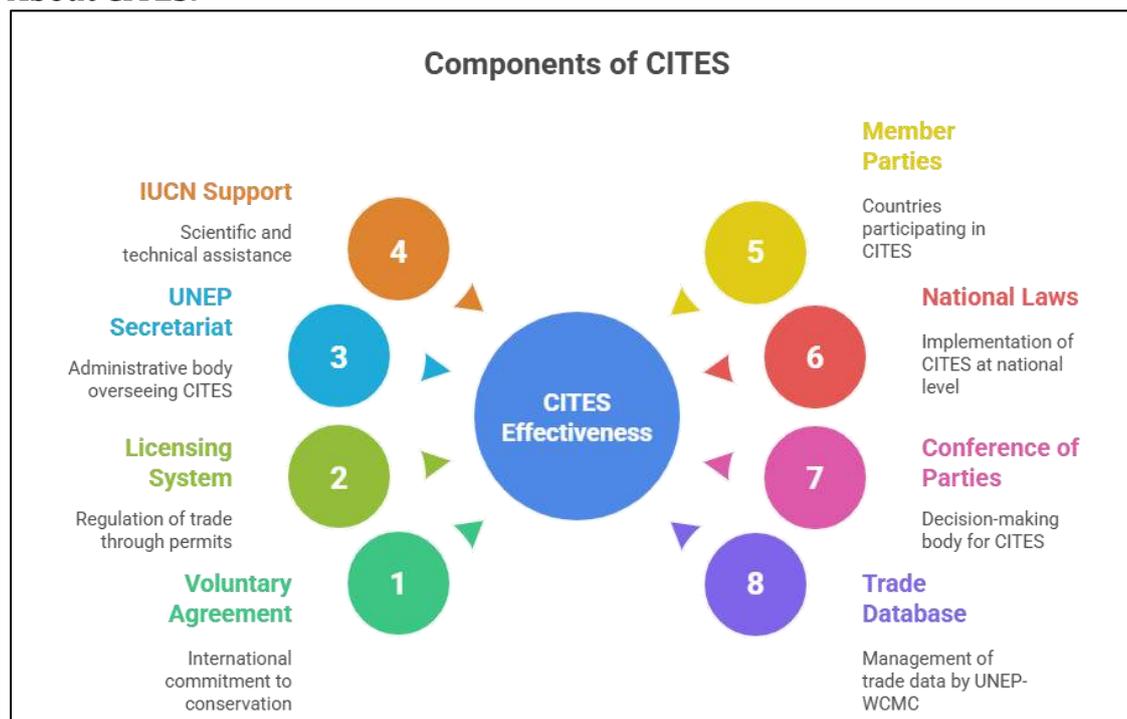
Broader Implications

- Could weaken domestic innovation in seed conservation.
- May affect India's bioprospecting potential and IPR frameworks.
- Threat to long-term food security by enabling unregulated global access to genetic heritage.

4. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) – 50 Years

Context: CITES marks 50 years since coming into force (1975). Conceived in 1963 at an IUCN meeting, it remains a pioneering global wildlife trade agreement.

About CITES:



- **Nature:** Voluntary international agreement to ensure trade in wild animal and plant specimens does not threaten their survival.
- **Mechanism:** Regulates import, export, and re-export through a licensing system.
- **Administration:** Secretariat under UNEP, Geneva. IUCN provides scientific and technical support.
- **Parties:** 185 members (India ratified in 1976).
- **Legal Status:** Binding on Parties but implemented via national laws.
- **Decision-making:** Conference of Parties (CoP) is the apex body (CoP3 held in New Delhi, 1981).
- **Database:** CITES Trade Database managed by UNEP-WCMC.

Coverage:

- Protects ~40,900 species (6,610 animals, 34,310 plants).

- Species are listed in Appendices I, II, III based on trade restrictions required.

Key Initiatives:

- MIKE Programme (1997): Monitors illegal killing of elephants in Africa & Asia.
- ICCWC (2010): Supports enforcement against wildlife and forest crime.
- Strategic Vision 2021–2030: Aligns trade with biodiversity & SDGs.
- CITES Tree Species Programme (2024): Focuses on sustainable use of listed trees.

Significance:

- First global treaty on wildlife trade; cornerstone for biodiversity protection.
- Success depends on national implementation and enforcement.

5. Secondary Pollutants & CREA Study Findings

Context: A CREA study highlights that secondary pollutants, especially ammonium sulphate, contribute nearly 34% of PM2.5 pollution in India.

About Secondary Pollutants:

- **Definition:** Pollutants formed in the atmosphere via chemical reactions between primary pollutants (e.g., SO₂, NO_x, NH₃) and other atmospheric compounds.
- **Examples:** Ozone (O₃), ammonium sulphate, ammonium nitrate, secondary organic aerosols.
- **Key Formation Pathway:**
 - ✓ Ammonium sulphate: $SO_2 + NH_3 \rightarrow (NH_4)_2SO_4$
 - ✓ Major sources: Coal combustion (SO₂), fertilizer use (NH₃).
 - ✓ Characteristics: Harder to control as they form indirectly and via multiple atmospheric reactions.

Findings from CREA Study:

- Ammonium sulphate forms ~34% of PM2.5 mass in India.
- Thermal power plants: Over 60% of SO₂ emissions; only 8% have Flue Gas Desulphurisation (FGD) installed.
- 2.5× higher ammonium sulphate levels within 10 km of coal plants.
- 114 of 130 NCAP cities: >30% PM2.5 from ammonium sulphate.
- Ammonium nitrate adds up to 50% of PM2.5 in some regions.

Impacts:

- Health: Respiratory ailments, cardiovascular diseases, premature mortality.
- Environment: Regional & transboundary haze, photochemical smog formation.
- Indicates weak enforcement of emission control technologies.

6. Kaziranga National Park

Context: Kaziranga is a biodiversity hotspot in Assam, globally renowned for its conservation of the Indian one-horned rhinoceros and unique Brahmaputra floodplain ecosystem.

About



- **Location & Status:**
 - ✓ Situated in Assam, along the Brahmaputra River floodplains.
 - ✓ UNESCO World Heritage Site (1985), Tiger Reserve (2006), and Wildlife Sanctuary.
- **Historical Background:**
 - ✓ Declared Reserve Forest in 1905 to protect rhinoceroses.
 - ✓ Upgraded to Wildlife Sanctuary in 1950 and National Park in 1974.
 - ✓ Mary Curzon's 1904 intervention led to its creation.
- **Flora:**
 - ✓ Tropical semi-evergreen & deciduous forests with species like *Bombax ceiba* and *Ficus* spp.
 - ✓ Alluvial grasslands (*Saccharum*, *Phragmites*) as grazing zones for large herbivores.
 - ✓ Seasonal flooding sustains wetlands and aquatic vegetation.
- **Fauna:**
 - ✓ Largest population of Indian one-horned rhinoceros (~2,413).
 - ✓ High tiger density; home to Asian elephants, wild water buffalo, and Eastern swamp deer (exclusive range).
 - ✓ Habitat for big cats, large snakes, and endangered vultures.
- **Key Facts:**
 - ✓ Grasslands resemble African savannas.
 - ✓ One of the few global sites hosting multiple big cat species outside Africa.
 - ✓ Critical for both megafauna conservation and Brahmaputra floodplain ecology.

7. Gharial & Sloth Bear Get Conservation Boost

Context: The Standing Committee of the National Board for Wildlife (SC-NBWL) has recommended the inclusion of the Gharial (*Gavialis gangeticus*) and Sloth Bear (*Melursus ursinus*) under the Species Recovery Programme of the Centrally Sponsored Scheme – Integrated Development of Wildlife Habitats (CSS-IDWH).

CSS-IDWH

- **Objective:** Financial & technical assistance to States/UTs for wildlife conservation.
- **Components:**
 - ✓ Support to Protected Areas (National Parks, Wildlife Sanctuaries, Conservation & Community Reserves)
 - ✓ Protection of wildlife outside PAs, mitigation of Human–Wildlife Conflict
 - ✓ Species Recovery Programmes for critically endangered species
- Coverage: 22 species so far, including Snow Leopard, Asiatic Lion, Great Indian Bustard, Red Panda, etc.
- Implementing Agency: Wildlife Institute of India
- Funding: National CAMPA

Gharial (*Gavialis gangeticus*)

- **Habitat:** Deep, fast-flowing freshwater rivers; nesting on sandy banks
- **Distribution:** Chambal, Girwa, Yamuna, Ganga, Brahmaputra; Rapti–Narayani (Nepal)
- **Status:**
 - ✓ IUCN: Critically Endangered
 - ✓ WPA 1972: Schedule I
 - ✓ CITES: Appendix I
- **Features:** Long, narrow snout; males have bulbous ghara; highly aquatic; key role in riverine ecosystems

Sloth Bear (*Melursus ursinus*)

- **Habitat:** Tropical dry/moist deciduous forests & scrublands
- **Distribution:** India, Nepal, Sri Lanka; five major biogeographic zones in India
- **Status:**
 - ✓ IUCN: Vulnerable
 - ✓ WPA 1972: Schedule I

✓ CITES: Appendix I

- **Features:** Shaggy black coat, white chest patch; adapted for eating termites & ants; nocturnal, solitary; females carry cubs on back

National Board for Wildlife (NBWL)

- Statutory Body: Constituted under Section 5A, Wildlife (Protection) Act, 1972 (amended 2022)
- Chairperson: Prime Minister of India
- Role: Advises GoI on wildlife policy; mandatory approval for altering PA boundaries or diverting wildlife habitats
- Standing Committee: Headed by MoEFCC; clears projects, while NBWL handles policy decisions

8. Sariska Tiger Reserve (STR)

Context: The Standing Committee of the National Board for Wildlife (SC-NBWL), chaired by the Union Environment Minister, has approved redrawing the Critical Tiger Habitat (CTH) boundaries of STR. Final approval from the Supreme Court is awaited. The Court is examining multiple STR issues suo motu, following recommendations from its Central Empowered Committee (CEC) to address human pressures such as village relocation and cattle grazing.

Proposed Changes:

- CTH expansion: 881.11 → 924.49 sq km
- Buffer zone reduction: 245.72 → 203.2 sq km
- Aim: Strengthen tiger conservation while accommodating developmental needs.
- May impact over 50 mining operations currently halted due to proximity to tiger habitat.

Ecological & Legal Context:

- CTH under Wildlife (Protection) Act, 1972 must remain free from human interference.
- Rationalisation balances ecological integrity with livelihood concerns.

Sariska Tiger Reserve – Overview

- **Location:** Alwar district, Rajasthan; part of the Aravalli hills.
- **History:**
 - ✓ Wildlife Sanctuary – 1955
 - ✓ Tiger Reserve under Project Tiger – 1978
 - ✓ National Park – 1979
- **Significance:** First tiger reserve in India to reintroduce tigers (2008) after local extinction due to poaching (2004).
- **Cultural Sites:** Kankarwadi Fort (Aurangzeb's prison for Dara Shikoh), Pandupole Hanuman Temple.
- **Flora:**
 - ✓ Predominantly tropical dry deciduous and scrub-thorn forests.
 - ✓ Dominant trees: Dhok (*Anogeissus pendula*), Khair, Tendu, Ber, Gugal, Bamboo.
- **Fauna:**
 - ✓ Apex predator: Royal Bengal Tiger.
 - ✓ Others: Leopard, Sambar, Nilgai, Wild boar, Hyena, Caracal.
 - ✓ Rich birdlife: Peafowl, Indian eagle-owl, endangered vultures.

9. Sulphur Dioxide Emissions & Public Health

Context: The Environment Ministry has exempted ~78% of India's coal-fired power plants from installing Flue Gas Desulphurisation (FGD) systems, reversing its 2015 mandate. This impacts over 180 plants (600 units) and raises concerns over SO₂ pollution control.

About SO₂ & FGD

- Sulphur Dioxide (SO₂): A colourless gas from coal combustion; causes respiratory diseases, cardiovascular issues, acid rain, and PM2.5 formation.
- India: Largest global SO₂ emitter due to coal-based power.
- FGD: Removes up to 95% of SO₂ from flue gases via wet, dry, or seawater scrubbing.

Rationale for Exemption

- Low Sulphur Content: Indian coal has 0.3–0.5% sulphur, often within permissible limits.
- High Costs: ~₹1.2 crore/MW; adds ₹0.72/kWh to tariffs.
- Vendor Shortage: Only 8% compliance since 2015.
- COVID-19 Delays: Supply chain disruptions.
- Climate Trade-off: Removing SO₂ may reduce cooling aerosols but increase net warming if CO₂ rises.
- Policy Focus Shift: Priority on PM control via Electrostatic Precipitators (ESPs).

Category-Wise FGD Rules

- A: NCR / million-plus cities – FGD by Dec 2027.
- B: Critically Polluted Areas / Non-Attainment Cities – FGD by Dec 2028 (EAC decision).
- C: Others – Exempt.

Health & Environmental Impacts of SO₂

- Health: Asthma, bronchitis, hospital admissions spike in polluted zones (e.g., Singrauli).
- Environment: Acid rain, soil degradation, visibility loss.
- PM_{2.5} Link: Secondary sulphates worsen air quality.

Global Best Practices

- China: 90% coal plants fitted with FGDs under strict SO₂ norms.
- EU: Binding SO₂ limits under Industrial Emissions Directive.
- US: Acid Rain Program with SO₂ cap-and-trade.

Alternatives & Way Forward

- Short-Term: ESPs for PM control, low-sulphur fuels, fluidized bed combustion, sorbent injection.
- Long-Term: Renewable energy transition, hybrid pollution control, CO₂ + SO₂ capture, vendor capacity expansion.
- Governance: Transparent policy shifts, scientific scrutiny, public debate, uniform enforcement.

10. Decline of Coral Cover in Lakshadweep

Context: A 24-year study (1998–2022) across Agatti, Kadmat, and Kavaratti atolls shows a 50% drop in coral cover in Lakshadweep reefs—from 37.24% to 19.6%—linked to recurring marine heatwaves and climate change.

Key Findings

- Long-term decline: Loss driven by repeated bleaching during ENSO events (1998, 2010, 2016).
- Reduced recovery: Coral regeneration now requires ≥6 years without bleaching—rare due to frequent heatwaves.
- Local variations: Depth, wave exposure, and location affect stress tolerance and recovery.
- Warning: Local restoration alone insufficient without global emission cuts.

Causes of Depletion

- Rising Sea Temperatures: Marine heatwaves disrupt coral–algae symbiosis → bleaching.
- Ocean Acidification: CO₂ absorption lowers pH, weakening coral skeletons.
- Pollution & Runoff: Nutrient overload → algal blooms; sediment blocks sunlight.
- Extreme Low Tides: Air exposure damages shallow corals.
- Human Activities: Destructive fishing, unregulated tourism, coastal development.

Implications

- Biodiversity Loss: Reefs support 25% of marine life; depletion disrupts ecosystems.
- Economic Impact: Reduced fisheries and tourism threaten coastal livelihoods.
- Coastal Protection Loss: Higher vulnerability to erosion, storm surges, and flooding.
- Scientific Setback: Potential medicinal resources lost with reef degradation.

Conservation Efforts

- **Global:**
 - ✓ International Coral Reef Initiative (ICRI)
 - ✓ Global Fund for Coral Reefs (GFCR)
- **Technological:**
 - ✓ Biorock Technology for mineral accretion.

- ✓ Super corals bred for heat tolerance.
- ✓ Cryomesh for coral larvae preservation.

Way Forward

- **Climate Action:** Achieve Paris Agreement targets, expand renewable energy, protect blue carbon ecosystems.
- **Local Stress Reduction:** Control pollution, enforce marine protected areas, regulate coastal activities.
- **Active Restoration:** Transplant resilient corals, deploy artificial reef structures.
- **Community Role:** Promote eco-tourism, train locals in reef-safe practices, diversify livelihoods.

11. Banni Grasslands & Project Cheetah

Context: The Banni Grasslands in Gujarat's Kutch district, Asia's largest tropical grassland, have been prepared for cheetah reintroduction under Project Cheetah with a 600-hectare enclosure, boosted prey base, and supporting infrastructure.

Banni Grasslands – Key Facts

- **Location:** Near the Great Rann of Kutch, Gujarat.
- **Origin:** Emerged from the sea due to tectonic uplift.
- **Vegetation:** Sparse, rainfall-dependent; dominated by halophytic grasses, low shrubs, and scattered trees.
- **Ecosystem:** Mosaic of wetlands and grasslands; home to Banni buffalo, Kankrej cattle, Indian wild ass, camels, and horses.
- **Communities:** Inhabited by pastoral groups such as Maldharis, Rabaris, Mutwas, and Meghwals.
- **Unique Feature:** Known for Chir Batti ("ghost lights").
- **Cheetah Habitat Suitability:** Resembles African savannah—open plains, scrublands, and abundant prey species like chital and sambar.

About Project Cheetah

- **Launch:** 2022, to reintroduce African cheetahs from Namibia & South Africa to India.
- **Significance:** First intercontinental reintroduction of a large carnivore.
- **Implementing Agency:** National Tiger Conservation Authority (NTCA) under MoEFCC.
- **Steering Committee:** Set up in 2023 for oversight and evaluation.
- **Past Relocations:** From Kuno National Park (MP) to Gandhi Sagar Sanctuary (MP).
- **Other Potential Sites:** Guru Ghasidas NP (Chhattisgarh), Desert NP & Shahgarh Grasslands (Rajasthan), Kaimur WLS (UP), among others.

Cheetah

- **Extinct in India:** 1952 (only large carnivore to go extinct here).
- **Speed:** World's fastest land mammal.
- **Behaviour:** Solitary; communicates via chirps, barks, and scent marking; does not roar.
- **Species:**
 - ✓ African Cheetah – Vulnerable (IUCN).
 - ✓ Asiatic Cheetah – Critically Endangered (IUCN), found only in Iran.

12. India's Earthquake Resilience

Context: The recent 4.4 magnitude earthquake near Delhi in July 2025 exposed serious gaps in urban seismic resilience, highlighting the urgent need for stricter enforcement of seismic safety norms across India.

India's Vulnerability:

- About 59% of India falls under earthquake-prone zones (Zone II to V as per BIS). The Himalayan belt, Northeast states, and Andaman & Nicobar Islands (Zone V) face the highest risk due to tectonic plate convergence. Major cities like Delhi (Zone IV), Guwahati (Zone V), Bhuj, Srinagar, and Gangtok are vulnerable to seismic shocks. Urban centers like Delhi face additional risks due to high population density, outdated buildings, and construction on liquefaction-prone soils.

Key Concerns:

- Over 80% of Delhi's buildings, especially those constructed before 2000, do not meet seismic safety standards.
- Many urban areas are built on soft soils vulnerable to liquefaction, increasing collapse risk during earthquakes.
- Rapid urbanization without adequate planning has led to unregulated constructions lacking seismic compliance.
- Enforcement of seismic codes remains weak, with limited retrofitting of existing structures.

Government Initiatives:

- Disaster Management Framework: NDMA, NDRF, and SDMAs coordinate disaster risk reduction and response.
- Seismic Monitoring: India expanded seismic observatories from 80 in 2014 to 168 in 2025, improving early detection.
- BhooKamp App: Provides real-time earthquake alerts to enhance public preparedness.
- Earthquake Risk Indexing: Risk profiling of 50 cities guides urban planning and retrofitting priorities.
- Building Codes: Revised BIS codes (IS 1893, IS 4326) simplify seismic design norms and promote compliance.
- Retrofitting Programs: Guidelines encourage strengthening vulnerable buildings using modern engineering methods.
- Early Warning Systems: Piloted in high-risk Himalayan zones to provide seconds-early alerts during quakes.

Global Best Practices for India:

- Strict Code Enforcement: Like Japan's post-Kobe earthquake reforms, India must enforce and update building codes rigorously.
- Early Warning Systems: Timely alerts, similar to Mexico's SASMEX system, can save lives by enabling rapid protective actions.
- Retrofitting Incentives: Financial aid programs, akin to California's Earthquake Brace + Bolt, can motivate structural upgrades.

Way Forward:

- Ensure strict compliance with seismic codes nationwide.
- Launch a large-scale retrofitting mission targeting schools, hospitals, and critical infrastructure.
- Reform urban planning by restricting construction on liquefaction-prone zones and mandating earthquake-resistant designs.
- Allocate dedicated annual funds (₹50,000 crore suggested) for seismic risk mitigation.
- Conduct widespread public awareness campaigns and earthquake drills to build community resilience.

13. Industrial Disasters in India

Context: Industrial disasters have repeatedly exposed the vulnerabilities of India's industrial safety framework. Recent tragic incidents like the Sigachi Industries blast in Hyderabad and the Virudhunagar fireworks factory fire highlight the urgent need to strengthen industrial safety measures. Understanding the causes, impacts, and preventive strategies is vital for sustainable industrial growth and public safety.

Key Industrial Disasters in India

- Bhopal Gas Tragedy (1984): Leak of methyl isocyanate gas causing over 15,000 deaths; led to the Environment Protection Act, 1986.
- Jaipur IOC Depot Fire (2009): Petrol vapour leak, raising urban safety concerns.
- Vizag Gas Leak (2020): Styrene gas release at LG Polymers plant.
- Neyveli Lignite Plant Explosion (2020): Boiler explosion causing fatalities.

Causes of Industrial Disasters

- Weak Regulatory Oversight: Understaffed and under-equipped inspectorates lead to poor enforcement of safety norms.

- Lack of Training & Awareness: Workers, especially contract laborers, often lack proper safety and emergency training.
- Poor Safety Culture: Neglect of safety protocols and management's inadequate commitment to safety.
- Equipment Failure & Maintenance Lapses: Use of outdated machinery and poor upkeep increases accident risk.
- Inadequate Risk Assessment: Insufficient hazard identification and mitigation measures.
- Faulty Siting: Hazardous industries located near dense populations magnify disaster impact.
- Informal Sector Challenges: Unregulated industrial units with negligible safety compliance.

Consequences of Industrial Disasters

- Human: Loss of lives, severe injuries, and long-term health issues including multi-generational effects.
- Environmental: Air, water, and soil pollution leading to ecosystem damage and loss of biodiversity.
- Economic: Job losses, disruption of local economies, and damage to agriculture.
- Social: Forced displacement and social disintegration.

Government Initiatives

- Factories Act, 1948 (amended post-Bhopal): Safety committees, officers, and hazardous operations regulation.
- Environment (Protection) Act, 1986: Broad environmental safeguards including hazardous chemical rules.
- Public Liability Insurance Act, 1991: Insurance coverage for victims of industrial accidents.
- Occupational Safety, Health and Working Conditions Code, 2020: Consolidation and enhancement of safety laws.
- Chemical Industrial Disaster Management Guidelines (2007): Framework for prevention, preparedness, and emergency response.

Recommended Disaster Management Measures

- Strengthen Enforcement: Increase and train inspectors; update laws to international best practices; impose strict penalties.
- Promote Safety Culture: Senior management must prioritize safety; encourage reporting of hazards without fear; conduct regular mock drills.
- Leverage Technology: Use AI and predictive analytics for early detection of risks and preventive maintenance.
- Strategic Industrial Zoning: Avoid placing hazardous units near populated areas; relocate existing units if necessary.
- Enhance Emergency Preparedness: Equip fire and medical services in industrial zones to handle chemical and industrial accidents.

SCIENCE AND TECHNOLOGY

1. National Biobank – Phenome India Project

Context: The National Biobank, inaugurated at CSIR–Institute of Genomics and Integrative Biology (IGIB) in July 2025, is a landmark step in building India's own longitudinal health database to advance precision medicine and biomedical research. Modeled on the UK Biobank but tailored to India's diversity, it will track individuals' health over time to study disease trends, treatment outcomes, and gene–environment interactions.

About the Biobank:

- Launched under: Phenome India–CSIR Health Cohort Knowledgebase (PI-CHeCK)
- Objective: Create a repository of biological samples and health data for early diagnosis, targeted therapies, and India-specific disease risk models.
- Coverage: 10,000 participants from varied regions, age groups, and socio-economic backgrounds.

- Data Collected: Genomic, lifestyle, clinical, imaging, biochemical, and molecular information.
- Focus Diseases: Diabetes, cancer, cardiovascular ailments, and rare genetic disorders.
- Significance: Enables AI-driven diagnostics, personalized treatment, and population-specific health policies.

Phenome India Project:

- Launch: 2023 by CSIR.
- Nature: First pan-India longitudinal health study, focusing on cardio-metabolic health.
- Participants: CSIR employees, pensioners, and spouses from 17 states & 24 cities.
- Aim: Develop India-specific risk prediction models and study lifestyle–genetic–environmental influences.

2. Synthetic Human Genome Project (SynHG)

Context: The UK has launched the world’s first Synthetic Human Genome Project to construct human DNA entirely from scratch, marking a shift from decoding to designing genetic material.

About the Project:

- Aim: To design and assemble artificial human chromosomes from chemically synthesized DNA.
- Led by: Ellison Institute of Technology, University of Oxford, Cambridge, Kent, Manchester, and Imperial College London.
- Funding: Initial grant of £10 million from the Wellcome Trust.
- Approach: Begins with creating the first fully synthetic human chromosome; includes a Care-full Synthesis program to address ethical, legal, and societal aspects.

Significance:

- Advances understanding of gene function beyond natural DNA editing.
- Potential to create disease-resistant cells, regenerate organs, and develop therapies for genetic and age-related disorders.
- Applications extend to climate-resilient crops and food security.

Risks & Concerns:

- Ethical dilemmas over “designer humans” and altering fundamental aspects of life.
- Potential misuse, including bioweapons.
- Regulatory and ownership challenges in controlling synthetic DNA technology.

Relation to Human Genome Project (HGP):

- HGP (1990–2003): Mapped and sequenced human DNA.
- SynHG: Moves from “reading” to “writing” the genome, enabling de novo chromosome creation.

Indian Context:

- India Genome Project by DBT aims to sequence Indian genomes for precision medicine and population-specific disease risk profiling.

3. Genetically Modified (GM) Crops in India

Context: Amid ongoing trade talks, the US has urged India to open its agriculture market to GM crops. India maintains agriculture and dairy as “sacrosanct red lines,” citing farmer livelihoods and biosafety concerns. Currently, Bt cotton is the only GM crop approved for commercial cultivation.

What are GM Crops?

- **Definition:** Plants whose DNA is altered using genetic engineering to introduce traits like pest resistance, drought tolerance, or nutritional enhancement.
- **Global Status:** Commercialised since 1994 (Flavr Savr tomato); cultivated in 29 countries over 190+ million ha.

Status in India

- **Approved:** Bt cotton (since 2002) – covers 90% of cotton area; initially boosted production by 193%, but yields have declined from 566 kg/ha (2013–14) to 436 kg/ha (2023–24) due to pest resurgence and outdated traits.
- **Pending Approvals:**
 - ✓ Bt brinjal (moratorium since 2009)

- ✓ GM mustard (environmental clearance in 2022; pending court nod)
- ✓ Herbicide-tolerant Bt cotton (illegally grown in 15–25% cotton area)
- ✓ Under Research: Chickpea, pigeonpea, sugarcane.

Benefits of GM Crops

- Higher Productivity & Pest Resistance – e.g., Bt cotton controlling bollworms.
- Climate Resilience – drought/heat/salinity-tolerant varieties.
- Nutritional Security – biofortified crops like Golden Rice, iron-rich rice.
- Reduced Post-Harvest Losses – extended shelf life varieties.
- Environmental Gains – reduced pesticide use, no-till farming, phytoremediation potential.

Challenges & Concerns

- Environmental Risks: Gene flow to wild species, biodiversity loss, herbicide-resistant weeds.
- Health Concerns: Potential allergens, long-term safety uncertainties.
- Regulatory Bottlenecks: Slow, opaque approvals (Bt brinjal, GM mustard).
- Socio-Economic Issues: Seed dependency, high costs, IPR disputes (e.g., Monsanto case).
- Illegal Cultivation: HT-Bt cotton without regulatory clearance.
- Global Competitiveness: Yield gaps vs. China/Brazil due to innovation delays.

Way Forward

- Transparent, Science-Based Regulation – independent authority, time-bound approvals, ecological monitoring.
- Boost Indigenous R&D – PPP model, region-specific GM traits, biofortified crops.
- Farmer-Centric Approach – affordable seeds, training, crop insurance, coexistence norms for GM & non-GM.
- Global Integration – align with international biosafety and trade standards.

4. CRISPR-Cas9 Gene Editing for Enhanced Phosphate Uptake in Japonica Rice

Context: Scientists at the National Institute of Plant Genome Research (NIPGR), Delhi have used CRISPR-Cas9 technology to boost phosphate uptake in japonica rice, achieving up to 40% higher yields with just 10% of the recommended phosphate fertilizer dose.

About CRISPR-Cas9

- **Definition:** Genome editing tool using the Cas9 enzyme as “molecular scissors” to cut DNA at targeted sites for insertion, deletion, or repair.
- **Advantage:** High precision, cost-effectiveness, and potential for sustainable agriculture.

Key Findings of the NIPGR Study

- **Target Gene:** OsPHO1;2 – responsible for phosphate transfer from roots to shoots.
- **Innovation:** Removed the binding site for repressor OsWRKY6 instead of deleting the repressor itself, enhancing phosphate transport efficiency.
- **Results:**
 - ✓ 20% yield increase with full fertilizer dose.
 - ✓ 40% yield increase using only 10% of the recommended phosphate fertilizer.
- **Benefit:** Faster phosphate absorption prevents nutrient loss via runoff.

Significance for India

- **Fertilizer Dependency:** India imports >4.5 million tonnes of phosphate fertilizers annually.
- **Soil Deficiency:**
 - ✓ 83% phosphorus-deficient soils.
 - ✓ Widespread nitrogen, potassium, and micronutrient deficits (Zn: 39%, Fe: 37%).
- **Potential Impact:** If adapted to indica rice, could improve yields, cut fertilizer imports, and promote sustainability.

About Japonica Rice

- **Type:** One of the two main eco-geographical races of *Oryza sativa* (other is Indica).
- **Traits:** Short-to-medium grains, sticky texture, awnless to long-awned spikelets.
- **Climate & Regions:** Cooler subtropics/temperate zones; grown in Japan, China, Korea, Vietnam, Indonesia.

Challenges & Considerations

- Regulatory & IPR Issues: Need clear frameworks for gene-edited crops.
- Off-Target Effects: Mitigated through advanced bioinformatics tools.
- Public Acceptance: Requires awareness about non-transgenic gene editing methods.

5. Gujarat's Tribal Genome Sequencing Project

Context: Gujarat has launched India's first Tribal Genome Sequencing Project, aiming to create a reference genetic database for precision healthcare in tribal populations.

About the Project

- Implementing Agency: Gujarat Biotechnology Research Centre (GBRC).
- Scope: Sequencing the genomes of 2,000 individuals from tribal communities across 17 districts.
- Title: Creation of Reference Genome Database for Tribal Population in Gujarat.

Objectives

- Identify genetic risk markers for inherited disorders like Sickle Cell Anaemia, Thalassaemia, and certain hereditary cancers.
- Enable personalised healthcare based on genetic profiles.
- Document natural immunity markers and disease resistance traits.
- Bridge the health equity gap through science-led tribal empowerment.

Genome Sequencing – Overview

- **Definition:** Determining the exact sequence of DNA bases (A, C, G, T) in an organism.
- **Types:**
 - ✓ Whole Genome Sequencing (WGS) – maps the entire DNA.
 - ✓ Partial Genome Sequencing – covers specific genome sections.
 - ✓ Targeted Gene Sequencing – focuses on selected genes.
- **Applications:** Early disease detection, personalised medicine, drug discovery, and crop improvement.

Significance

- Healthcare Equity: Early detection and tailored treatment for underserved tribal communities.
- Data-Driven Policy: Baseline genomic database for long-term health research and targeted interventions.
- Model for India: Potential to replicate in other states for region-specific genomic health planning.

6. CRISPR-dCas9 & SafeEXO-Cas Innovations

Context:

Recent advances in gene-editing have yielded two key innovations:

CRISPR-dCas9-based molecular tool by the Bose Institute (DST) to enhance plant heat and pathogen resistance.

SafeEXO-Cas platform by Columbia University for precise CRISPR delivery in medicine.

• CRISPR-dCas9-Based Molecular Tool (India)

✓ **What it is:** Modified CRISPR-Cas9 where Cas9 is inactivated (dCas9), acting as a gene switch rather than a DNA-cutting enzyme.

✓ Mechanism:

- Uses a transmembrane (TM) domain from tomato protein NACMTF3 to keep dCas9 outside the nucleus under normal conditions.
- Under stress (heat or pathogen), dCas9 enters the nucleus and activates defense genes.
- Pathogen Response: Activates CBP60g and SARD1 (immune response).
- Heat Response: Activates NAC2 and HSFA6b (thermotolerance, water retention).

✓ **Application:** Tested in tomato, potato, tobacco – most effective in tomato.

• SafeEXO-Cas Platform (USA)

✓ **What it is:** Exosome-based CRISPR/Cas9 delivery system for targeted gene editing.

✓ Features:

- Utilises natural vesicles (exosomes) for safer, efficient delivery to specific cells.

- Enhances precision medicine and cancer therapy potential.

About CRISPR/Cas9 Technology

- **Definition:** Genome-editing tool using Cas9 protein guided by RNA to cut DNA at targeted sites.
- **Applications:**
 - ✓ Agriculture – improve crop resilience.
 - ✓ Medicine – treat genetic disorders (e.g., sickle cell disease).
 - ✓ Research – study gene functions in plants, animals, humans.

Significance for India

- Agriculture: Resilient crops for climate change adaptation.
- Healthcare: Potential for personalised medicine and low-cost genetic therapies.
- Research Leadership: Positions India in the global biotech innovation landscape.

7. Optical Atomic Clocks – Towards Redefining the Second

Context: Scientists have achieved the most precise global comparison of 10 optical atomic clocks across three continents, paving the way for redefining the SI unit of time – the second – by 2030.

Current Definition of Second

- Since 1967, the second is defined as 9,192,631,770 cycles of microwave radiation from a Caesium-133 atom.
- **Caesium Atomic Clocks:**
 - ✓ Invented by Louis Essen in 1955.
 - ✓ Operate in microwave range of the EM spectrum.
 - ✓ Accuracy: Drift of 1 second in ~300 million years.
 - ✓ India maintains time using five Cs atomic clocks at the National Physical Laboratory, New Delhi.

Optical Atomic Clocks

- Use atoms like Strontium-87, Ytterbium-171, Indium-115.
- Operate at optical (visible) frequencies, ~10,000× higher than microwaves.
- Triggered by lasers, producing highly stable and coherent light.
- Accuracy: Drift of 1 second in ~15 billion years → ~100× better than Cs clocks.

Advantages & Applications

- Higher Precision: Improved GPS accuracy, advanced climate monitoring, deep-space navigation.
- Scientific Research: Quantum sensing, fundamental physics tests.
- Technology: High-speed network synchronisation, radio astronomy.

Why Redefinition?

- Modern applications demand precision beyond Cs clocks.
- Global precision comparison of optical clocks builds confidence for official adoption by 2030.

8. Motherless Mice via Epigenetic Reprogramming

Context: Researchers at Shanghai Jiao Tong University have created healthy, fertile mice from the DNA of two male parents, marking a breakthrough in epigenetic programming for reproductive biology.

Key Highlights

- **Technique Used:**
 - ✓ Combined CRISPR-Cas genome editing with epigenetic reprogramming.
 - ✓ Modified DNA methylation patterns in one sperm cell to mimic maternal genetic imprinting.
- **Process:**
 - ✓ Egg DNA removed.
 - ✓ Two sperm heads injected – one epigenetically modified.
 - ✓ Embryo implanted in a female mouse for gestation.
- **Outcome:**
 - ✓ From 250 embryos, 3 live male mice were born.
 - ✓ Demonstrated viability, though with low success rate and possible health risks from deletions.

Scientific Basis

- Genomic Imprinting:
 - ✓ Only one parental gene copy is expressed; the other is silenced.
 - ✓ Errors cause disorders like Prader-Willi and Angelman syndromes.
 - ✓ Male and female gametes imprint DNA differently via methylation.
- Epigenetics:
 - ✓ Heritable, reversible changes in gene activity without altering DNA sequence.
 - ✓ Mechanisms: DNA methylation, histone modification, non-coding RNA interference.
 - ✓ Influenced by diet, toxins, stress, environment.

Significance

- Reproductive Science: Opens pathways for same-sex reproduction in mammals.
- Medical Potential: Could help understand and treat imprinting disorders.
- Ethical Concerns: Germline editing risks, low success rates, and long-term health impacts.

9. Quantum Noise

Context: A joint study by Raman Research Institute (RRI), IISc Bangalore, and IISER Kolkata has revealed that quantum noise, long considered detrimental, can in some cases enhance, revive, or even generate quantum entanglement.

About Quantum Noise

- **Definition:** Random disturbances in quantum systems due to environmental interactions, causing decoherence and loss of quantum properties.
- **Causes:**
 - ✓ Heisenberg Uncertainty Principle limits measurement precision.
 - ✓ Thermal fluctuations, electromagnetic interference, imperfect quantum gates.
- **Types:**
 - ✓ Amplitude Damping: Energy loss from qubits.
 - ✓ Phase Damping: Loss of phase coherence.
 - ✓ Depolarizing Noise: Randomization of quantum state.

Key Study Findings

- Positive Role: Amplitude damping can create, preserve, or revive entanglement in intraparticle systems.
- Resilience: Intraparticle entanglement is more resistant to noise than interparticle entanglement, which decays steadily.
- Tools Developed: A Global Noise Model and an analytical formula to predict entanglement behavior under varied noise conditions.

About Quantum Entanglement

- **Definition:** Quantum phenomenon where particles share linked states, regardless of distance.
- **Types:**
 - ✓ Intraparticle: Entanglement between properties of the same particle (e.g., spin & path).
 - ✓ Interparticle: Entanglement between separate particles.
 - ✓ Applications: Quantum computing, quantum cryptography, secure communication.

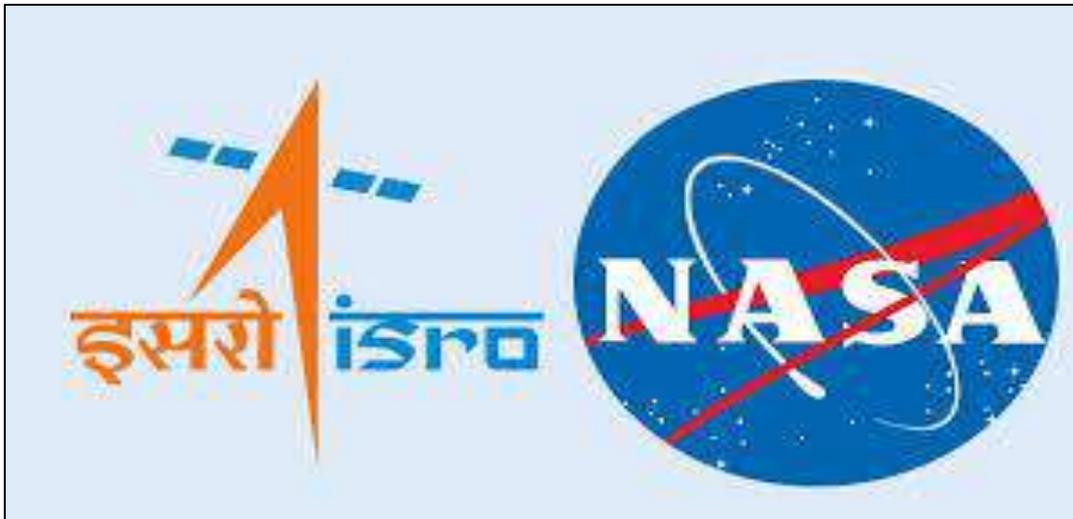
Significance

- Enhances error mitigation strategies in quantum computing.
- Aids in designing robust quantum systems for real-world noisy environments.
- Opens avenues for noise-assisted quantum technologies.

10. NISAR Satellite

Context: ISRO has launched the NASA-ISRO Synthetic Aperture Radar (NISAR) satellite from Sriharikota aboard GSLV-F16, marking the first joint Earth observation mission between NASA and ISRO.

About NISAR



- First Satellite to use dual-frequency SAR (L-band by NASA, S-band by ISRO) from a single platform.
- Mass: ~2,392 kg
- Orbit: 743 km Sun-synchronous, inclination 98.4°
- Mission Life: 5 years
- Technology: SweepSAR with a 12 m unfurlable antenna (NASA) integrated with ISRO's I3K bus.

Key Features

- L-band SAR: Penetrates vegetation, ice, and soil – useful for biomass & deformation studies.
- S-band SAR: Effective for crop, wetland, and surface monitoring.
- Coverage: 242 km swath, high-resolution, all-weather, day/night capability, 12-day repeat cycle.

Applications

- Disaster Management: Tracks earthquakes, landslides, volcanic deformation.
- Environmental Monitoring: Forest biomass, carbon stock, agricultural extent & growth cycles, wetland changes.
- Cryosphere Studies: Glacier and sea ice melt in polar regions.
- Water & Climate: Soil moisture mapping, surface water monitoring, storm tracking.

Significance

- Strengthens Indo-US space cooperation; part of deeper strategic space ties alongside Artemis Accords & human spaceflight collaborations.
- Boosts India's role as a "Vishwa Bandhu" in global science partnerships.
- Supports sustainable agriculture, climate change mitigation, and disaster resilience.

Radar Bands

- L & S Bands: Lower frequency, penetrate clouds, vegetation, rain – ideal for Earth observation.
- Higher Bands (X, Q, V, W): Better resolution but weather-sensitive.

11. Matter-Antimatter Asymmetry

Context: Physicists at CERN's Large Hadron Collider (LHC) have, for the first time, observed CP violation in baryons, marking a significant step toward explaining why the universe is dominated by matter.

Background:

- Matter vs. Antimatter: The Big Bang should have produced equal amounts of both, but the observable universe consists almost entirely of matter.
- Antimatter: Mirror counterpart of matter with identical mass but opposite charge (e.g., electron ↔ positron, proton ↔ antiproton). When matter and antimatter meet, they annihilate into energy.
- **CP Symmetry and Violation:**
 - ✓ C (Charge Conjugation): Swapping particles with antiparticles.
 - ✓ P (Parity): Mirror-flipping spatial coordinates.

- ✓ CP Symmetry: Physical laws should remain unchanged under both transformations.
- ✓ CP Violation: Deviation from this symmetry, leading to different behavior of matter and antimatter.
- ✓ Importance: Listed by Andrei Sakharov (1967) as one of three conditions for a matter-dominated universe (along with baryon number violation and departure from thermal equilibrium).
- **The Discovery:**
 - ✓ Conducted by the LHCb experiment (2011–2018 data).
 - ✓ Observed in Λ_b^0 baryon (containing up, down, and bottom quarks) and its antiparticle.
 - ✓ Found a 2.45% difference in decay patterns into a proton, kaon, and two pions.
 - ✓ First such observation in baryons; previously only seen in mesons.

Significance:

- Baryons (like protons, neutrons) make up all visible matter; thus, CP violation here is directly linked to the matter-antimatter imbalance problem.
- While consistent with the Standard Model, the observed CP violation is insufficient to fully explain the asymmetry—pointing toward new physics beyond the Standard Model.

Future Outlook:

- Further study of baryon decays and refinement of measurement techniques.
- Possible discovery of new particles or forces to explain the missing antimatter.

12. India's First Equine Disease-Free Compartment (EDFC)

Context: India has established its first Equine Disease-Free Compartment (EDFC) at the Remount Veterinary Corps (RVC) Centre & College, Meerut Cantonment, Uttar Pradesh, officially recognised by the World Organisation for Animal Health (WOAH).

About EDFC:

- Purpose: A scientifically managed, internationally certified zone ensuring horses are free from designated equine diseases, enabling their participation in global trade and competitions.
- Established under: Ministry of Fisheries, Animal Husbandry & Dairying.
- Recognition: Complies with WOAH's Terrestrial Animal Health Code on compartmentalisation.

Disease-Free Status:

- Certified free from:
 - ✓ Equine Influenza
 - ✓ Glanders
 - ✓ Surra
 - ✓ Equine Piroplasmiasis
 - ✓ Equine Infectious Anemia

India has also been African Horse Sickness-free since 2014.

Key Features:

- Strict Biosecurity: SOP-based hygiene, pest control, waste management, and veterinary surveillance.
- Continuous Monitoring: 24/7 veterinary screening for early detection and rapid containment.
- Defined Health Sub-Population: Maintains isolated, disease-free horse groups.

Significance:

- Boosts International Trade: Facilitates export of Indian sport horses to high-value markets.
- Promotes Equestrian Sports: Enables Indian participation in global events.
- Strengthens Biosecurity: Enhances India's reputation in global animal health governance.
- Replicable Model: Being adapted for Highly Pathogenic Avian Influenza (HPAI)-Free Compartments in the poultry sector.

13. AdFalciVax – India's First Indigenous

Context: The Indian Council of Medical Research (ICMR) is developing AdFalciVax, a recombinant chimeric malaria vaccine targeting Plasmodium falciparum.

About AdFalciVax:

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- Type: Multistage, chimeric vaccine targeting both pre-erythrocytic (liver) and sexual (mosquito transmission) stages.
- Development: Joint effort by ICMR, RMRC-Bhubaneswar, NIMR, and DBT-NII.
- Platform: Produced using *Lactococcus lactis* – a safe, food-grade bacterium.
- Objective: Provide individual protection and block transmission in the community.

Key Features:

- Dual-stage immunity: Prevents infection and halts spread.
- Extended stability: Functional at room temperature for over 9 months.
- Broader immune coverage: Reduces parasite immune evasion.
- Scalable & cost-effective: Suitable for mass production.
- Licensing model: Non-exclusive, enabling wider domestic and global manufacturing.

Significance:

- Strengthens Make in India and Malaria Elimination by 2030 goals.
- Potentially lowers malaria deaths in endemic tribal and rural areas.
- Enhances India's standing in indigenous vaccine innovation for tropical diseases.

Malaria in India:

- Caused by Plasmodium parasites, spread via infected female Anopheles mosquitoes.
- India reduced cases from 11.69 lakh (2015) to 2.27 lakh (2023).
- In 2024, India exited WHO's High Burden to High Impact list.

14. Sanchar Mitra Scheme

Context: The Department of Telecommunications (DoT) has rolled out the Sanchar Mitra Scheme nationwide to promote digital literacy, cyber hygiene, and telecom awareness by engaging youth as digital ambassadors.

About the Scheme

- **Type:** Volunteer-based digital outreach programme.
- **Volunteers:** University students from telecom, electronics, computer science, and cybersecurity streams.
- **Role:** Raise awareness on telecom safety, cyber fraud prevention, responsible mobile usage, and EMF radiation concerns.

Key Features

- Selection & Engagement: Students nominated in collaboration with local DoT field units.
- Training: Conducted by National Communications Academy–Technology (NCA-T) and DoT's Media Wing in 5G, 6G, AI, cybersecurity, and EMF safety.
- Outreach Activities:
 - ✓ Awareness campaigns at grassroots level.
 - ✓ Collaboration with NGOs and community groups.
- Recognition & Incentives: Internships, participation in India Mobile Congress, involvement in national projects, and exposure to International Telecommunication Union (ITU) forums.

Objectives

- Promote digital literacy and safe telecom practices.
- Bridge the gap between citizens and government telecom initiatives.
- Empower youth to contribute to cybersecurity awareness and digital inclusion.

Significance

- Cyber Safety: Helps curb cyber fraud and misinformation.
- Digital Inclusion: Enables informed citizen participation in the digital economy.
- Youth Empowerment: Utilises India's demographic dividend for nation-building.

INTERNAL SECURITY

1. India's Recent Missile Developments

Context: India has recently conducted successful trials of the Akash Prime air defence system in Ladakh and test-fired its indigenously developed Prithvi-II and Agni-I ballistic missiles from the Integrated Test Range, Chandipur, Odisha.

Akash Prime

- Type: Upgraded medium-range surface-to-air missile (SAM).
- Range: 25–30 km; operational up to 4,500 m altitude.
- Upgrades:
 - ✓ Indigenous active Radio Frequency (RF) seeker for improved terminal accuracy.
 - ✓ Enhanced low-temperature performance for high-altitude deployment.
- Role: Protects mobile, semi-mobile, and static military installations from aerial threats.
- Special Features: Multi-target engagement, high automation, cross-country mobility.

Prithvi-II

- Type: Short-range, surface-to-surface ballistic missile (SRBM).
- Range: 250–350 km.
- Payload: Conventional or nuclear warheads.
- Propulsion: Liquid fuel with inertial navigation for high accuracy.
- Developer: DRDO under the Integrated Guided Missile Development Programme (IGMDP).

Agni-I

- Type: Nuclear-capable, short-to-medium range ballistic missile (MRBM).
- Range: 700–900 km.
- Payload: 1,000 kg warhead.
- Mobility: Road and rail mobile.
- Role: Fills the range gap between Prithvi series and longer-range Agni missiles; key to India's credible minimum deterrence.

Ballistic Missile Classification (by range)

- Short-range: < 1,000 km
- Medium-range: 1,000–3,000 km
- Intermediate-range: 3,000–5,500 km
- Intercontinental (ICBM): > 5,500 km (Agni-V exceeds 5,000 km).

2. INS Udaygiri & Project 17A Frigates

Context: INS Udaygiri (Yard 12652), the second of seven Project 17A frigates, has been delivered to the Indian Navy by Mazagon Dock Shipbuilders Limited (MDSL), Mumbai.

About INS Udaygiri:

- Second ship of Project 17A, a follow-on of the Shivalik-class (Project 17) frigates.
- Named after the Udaygiri mountain range in Andhra Pradesh; a modern avatar of the Leander-class frigate INS Udaygiri (1976–2007).
- Multi-mission, blue-water capable, designed to counter both conventional and non-conventional threats.
- **Project 17A Features:**
 - ✓ Seven ships: 4 at MDSL (Mumbai), 3 at GRSE (Kolkata).
 - ✓ Stealth-enhanced hull design with reduced radar cross-section and low acoustic signature.
 - ✓ Equipped with state-of-the-art indigenous weapons and sensors: supersonic surface-to-surface missiles, medium-range SAMs, 76 mm gun, and rapid-fire CIWS.
 - ✓ Propulsion: Combined Diesel or Gas (CODOG) system with controllable pitch propellers and Integrated Platform Management System (IPMS).
 - ✓ Emphasis on indigenous sourcing, boosting MSMEs, employment, and self-reliance.

Significance:

- Project 17A frigates strengthen India's maritime security with enhanced stealth, firepower, and operational endurance in hostile environments.

3. Indian Army Unveils Comprehensive Defence Modernisation Roadmap

Context: The Indian Army has launched a comprehensive defence modernisation roadmap aimed at transforming its capabilities to meet future warfare challenges across multiple domains.

Key Highlights:

- **Advanced Weapon Systems:** Focus on developing ultra-fast, manoeuvrable systems including hypersonic glide vehicles, hypersonic air-breathing engines (HEBs), and advanced missiles from 4th to 6th generation. Transition from conventional ammunition to smart, precision-guided munitions like loitering munitions.
- **Directed Energy Weapons:** Development of high-energy lasers and microwave systems for counter-drone operations, missile defence, and anti-satellite roles.
- **Cyber & Electronic Warfare (EW):** Emphasis on spectrum dominance through next-generation cyber defence tools, autonomous EW solutions, and resilient satellite systems.
- **Soldier-Centric Modernisation:** Equipping soldiers with exoskeletons, human augmentation systems, smart body armour, AI-powered helmets, smart apparel, augmented reality-based battlefield management, and real-time health monitoring.
- **Logistics & Infrastructure:** Modernising supply chains using AI, blockchain, and IoT to build green, sustainable, and cyber-resilient logistics networks.
- **Synergy:** Coordination between military, policymakers, and industry to define operational needs, create enabling policies, and innovate tailored defence solutions.

India's Broader Defence Initiatives:

- Long-term planning through the 10-Year Integrated Capability Development Plan (ICDP).
- Establishment of niche forces such as Defence Space Agency, Defence Cyber Agency, and Armed Forces Special Operations Division.
- Support to defence startups under the Innovations for Defence Excellence (iDEX) program with funding up to ₹1.5 crore.
- Push for Atmanirbharta in defence manufacturing via positive indigenisation lists, SRIJAN portal, and liberalised FDI norms in defence R&D.

Significance:

- This roadmap strengthens India's defence preparedness by integrating cutting-edge technology and fostering indigenous innovation, crucial for securing the nation's strategic interests in a rapidly evolving security environment.

4. Indian Army's AI Roadmap

Context: The Indian Army has outlined a comprehensive roadmap to integrate Artificial Intelligence (AI), Machine Learning (ML), and Big Data Analytics into its operations by 2026–27. This initiative aims to enhance battlefield awareness, decision-making speed, and operational efficiency, aligning with India's National AI Strategy and Atmanirbhar Bharat vision.

Key Focus Areas:

- **Combat and Surveillance:** AI-driven real-time battlefield surveillance, drone swarming, and adversary mapping.
- **Decision Support:** AI-enabled tactical planning, threat detection, and wargaming simulations.
- **Cyber and Electronic Warfare:** AI for cybersecurity, signal jamming, and electronic countermeasures.
- **Logistics and Maintenance:** AI-based supply chain optimisation and predictive maintenance.
- **Training:** AI-powered simulations and personalised training programs.

Benefits:

- Faster, smarter decisions with rapid data processing.
- Force multiplication through autonomous systems handling dangerous tasks.
- Reduced soldier risk via AI-powered drones and robots.

- Greater precision in targeting, reducing collateral damage.
- Cost-effective and scalable technology deployment.

Challenges:

- Ethical concerns over autonomous lethal systems and accountability.
- Vulnerabilities to cyber-attacks and AI manipulation.
- Integration difficulties with legacy military platforms.
- Lack of defence-specific data ecosystems and skilled AI personnel.
- Dependence on foreign AI hardware and software.

Initiatives Supporting AI Integration:

- Formation of an AI Task Force under the Directorate General of Information Systems.
- Innovations for Defence Excellence (iDEX) encouraging AI startups.
- Development of AI projects like Combat Information Decision Support System (CIDSS) and Operational Data Fusion.
- Collaboration with academia and industry for AI research and capacity building.

Global Context:

- Countries like the US, China, Russia, Israel, and the UK are rapidly advancing military AI for surveillance, autonomous systems, and cyber warfare. India’s roadmap emphasizes responsible AI adoption, balancing technological edge with ethical and legal frameworks.

SOCIAL ISSUES

1. Equal Inheritance Rights for Tribal Women

Context: Recently, the Supreme Court ruled in Ram Charan v. Sukhram (2025) that tribal women have equal rights to ancestral property, marking a landmark step towards gender equality in tribal communities.

Background:

- The case arose from the denial of inheritance rights to Dhaiya, a tribal woman, over her maternal grandmother’s property. Lower courts dismissed her claim, citing the Hindu Succession Act (HSA) 1956’s inapplicability to Scheduled Tribes and absence of specific customary laws granting such rights.

Key Ruling:

- Tribal women cannot be denied inheritance rights solely based on unproven customs.
- Denial violates Articles 14 (Equality before the law) and 15(1) (Prohibition of sex discrimination).
- The Court emphasized applying “justice, equity, and good conscience” in absence of any specific tribal custom forbidding women’s inheritance.
- Customs must evolve and cannot indefinitely bar women’s rights.

Legal Context:

- The HSA 1956 and its 2005 amendment granted daughters equal coparcenary rights in Hindu ancestral property but excluded Scheduled Tribes unless notified otherwise.
- Customary laws governing tribal property vary widely and often favor male heirs.
- Constitutional provisions (Articles 14, 15, 38, 46) uphold gender equality and social justice, overriding discriminatory customs.

Significance:

- This verdict rejects the “test of Hinduisation” that required tribal women to prove abandonment of customary laws to claim rights. It reinforces that absence of valid custom barring women’s inheritance means courts must protect women’s property rights.

Challenges and Way Forward:

- Deep-rooted patriarchy and lack of awareness limit women’s actual access to property.
- Legal reforms should extend HSA protections explicitly to tribal communities.
- Awareness campaigns, affordable legal aid, and alignment of customary laws with constitutional principles are essential for effective enforcement.

2. Role of Social Organisations in Nation and Society Development

Context: The Lok Sabha Speaker, addressing the JITEM Youth Conclave 2025, highlighted the crucial role of social organisations in the holistic development of society and the nation.

What are Social Organisations?

- Social organisations are non-state, non-profit entities such as NGOs, civil society organisations, community-based groups, religious institutions, trade unions, and philanthropic bodies. Though independent of the government, they often complement state efforts in social welfare and development.

Key Roles of Social Organisations

- **Policy Advocacy:** They represent marginalized communities, influence policymaking, and ensure grassroots issues reach decision-makers. For example, the Mazdoor Kisan Shakti Sangathan (MKSS) led the RTI movement promoting transparency.
- **Service Delivery:** Filling gaps in health, education, sanitation, and disaster relief, especially in underserved areas. NGOs like Goonj provided critical COVID-19 relief.
- **Governance and Accountability:** Act as watchdogs by monitoring government schemes and electoral processes. MKSS pioneered social audits to ensure welfare scheme transparency.
- **Community Empowerment:** Mobilize communities and build leadership, exemplified by SEWA's work with informal women workers.
- **Innovation:** Develop scalable solutions in social sectors, e.g., Akshaya Patra's mid-day meal program.
- **Environmental Action:** Drive climate policy advocacy, as seen with the Centre for Science and Environment (CSE).
- **Digital Rights:** Protect privacy and net neutrality, championed by the Internet Freedom Foundation (IFF).
- **Democratic Participation:** Foster citizen engagement in governance, enhancing participatory democracy.

Significance

- Social organisations bridge state capacity gaps, especially for marginalized groups like women, Dalits, Adivasis, and persons with disabilities. They enable participatory development and pioneer innovative models that governments later scale. Their watchdog role strengthens democratic governance and rights-based laws.

Ethical Foundation

- Rooted in the ethos of Dharma and Gandhian trusteeship, social organisations embody selfless service (Nishkama Karma), compassion, and inclusivity. Many draw inspiration from spiritual values such as Ahimsa (non-violence) and promote collective social conscience.

Challenges

- Complex regulations and funding restrictions (e.g., FCRA) hinder operations.
- Dependence on foreign funds and lack of institutional capacity limit sustainability.
- Fragmentation, urban bias, and low digital adoption weaken impact and outreach.
- Accountability and trust deficits affect credibility.

Successful Examples

- Grameen Bank revolutionized microfinance empowering women.
- Barefoot College trained rural women as solar engineers.
- Akshaya Patra improved child nutrition through school meals.
- Association for Democratic Reforms (ADR) promotes electoral transparency.

3. Three Language Policy

Context: The recent withdrawal of Maharashtra's three language policy for primary education has reignited debates on language education, federalism, and the implementation of the National Education Policy (NEP) 2020 across India.

Background

- Maharashtra's policy mandated Hindi as a compulsory third language from Class 1 alongside Marathi and English, affecting around 80 lakh students. This marked a shift from the previous practice where Hindi was introduced from Class 5. Due to widespread opposition and implementation challenges, the state government revoked the policy and formed an expert committee led by Narendra Jadhav to recommend the way forward.

Educational Considerations

- Research supports early childhood language acquisition, ideally between ages 2-8. However, experts caution against formal classroom instruction at too early an age, emphasizing strong mother tongue foundation first. States like Andhra Pradesh and Telangana show better academic outcomes with early mother tongue instruction.

Implementation Challenges

Maharashtra's experience highlights systemic issues nationwide:

- Teacher shortages in Hindi, Sanskrit, and Urdu.
- Lack of curriculum and textbooks ready for early language teaching.
- Resource and infrastructure constraints limiting effective rollout.

Constitutional and Federal Dimensions

- India's Constitution protects linguistic diversity:
 - ✓ Article 350A mandates mother tongue instruction for minorities.
 - ✓ Article 29 safeguards cultural and linguistic rights.
 - ✓ Article 351 promotes Hindi's spread.
- Education falls under the concurrent list, allowing both Centre and states to legislate, which often leads to conflicts. NEP 2020 states no language will be imposed on any state, reflecting the need for flexibility.

Lessons Learned

- Stakeholder Engagement: Policies must be formed after wide consultations with educators, linguists, and communities.
- Resource Allocation: Teacher training, curriculum, and materials must be adequately planned.
- Flexibility: States require autonomy to adapt policies to local linguistic realities.
- Mother Tongue Priority: Early education should prioritize the mother tongue to boost cognitive and academic development.

Broader Context

- India's linguistic diversity—with 22 official languages and numerous dialects—is both a strength and a policy challenge. The three language formula, rooted in the 1968 Kothari Commission, aims to promote multilingualism and national integration but sees varied acceptance across states.

Way Forward

- The Jadhav Committee's recommendations will be crucial not only for Maharashtra but also as a guide for other states. It will need to balance constitutional rights, educational research, regional sentiments, and practical feasibility.

4. Dowry Deaths in India

Context: Despite strict laws, dowry-related deaths continue to plague India, with states like Uttar Pradesh, Bihar, West Bengal, Odisha, and Haryana reporting high incidents. Women face harassment, abuse, and sometimes death due to dowry demands, while legal processes remain slow and convictions rare.

Legal Framework:

Dowry Prohibition Laws

Dowry Prohibition Act

Criminalizes the act of giving and taking dowry.



Dowry Death Definition

Defines dowry death as unnatural death within 7 years of marriage due to dowry-related cruelty.



Definition of Cruelty

Defines cruelty as harassment for unlawful demands of money or property.



Penalizing Cruelty

Penalizes cruelty by husband or relatives towards the wife.



- Dowry Prohibition Act, 1961: Criminalizes giving and taking dowry.
- Section 80, Bharatiya Nyaya Sanhita (BNS): Defines dowry death as unnatural death of a woman within 7 years of marriage due to cruelty or harassment over dowry, punishable by 7 years to life imprisonment.
- Section 86, BNS: Defines cruelty, including harassment to meet unlawful demands for money or property.
- Section 85, BNS (Earlier IPC 498A): Penalizes cruelty by husband or relatives.

Reasons for Persistence:

- Cultural Entrenchment: Dowry remains socially accepted in many communities, disguised as “gifts.”
- Patriarchy and Gender Bias: Women are viewed as financial burdens, leading to coercion and abuse.
- Economic Pressures: Rising consumerism and social media increase dowry demands.
- Weak Law Enforcement: Investigations are slow, with many cases stuck without charge sheets; only about 100 convictions occur annually.
- Underreporting: Fear, stigma, and social pressure prevent many victims from seeking justice.

Judicial Observations:

- Supreme Court rulings have condemned dowry as a social evil and stressed the need for strict enforcement and societal change. Courts also warn against misuse of laws while emphasizing protection for genuine victims.

Challenges in Justice Delivery:

- Delayed and inadequate investigations.
- Judicial backlog with over 90% cases pending.
- Police often mediate complaints instead of treating them as criminal cases.
- Victim and witness intimidation leading to withdrawal of complaints.

Way Forward:

- Fast-track Courts: Expedite dowry death trials to ensure timely justice.
- Enhanced Police Training: Improve sensitivity and urgency in handling cases.
- Economic and Educational Empowerment: Strengthen schemes like Beti Bachao Beti Padhao, skill development, and financial independence to reduce vulnerability.
- Safe Reporting Mechanisms: Use technology for anonymous complaints and legal protection for whistleblowers.
- Support Systems: Establish shelters with counseling, legal aid, and livelihood support for survivors.
- Social Awareness: Campaigns to change societal attitudes against dowry and gender discrimination.

5. PARAKH Rashtriya Sarvekshan Report

Context: The 2024 PARAKH Rashtriya Sarvekshan (RS) report, conducted by NCERT under the Ministry of Education, reveals significant learning gaps among Indian students in Grades 3, 6, and 9,

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especially in mathematics, language, and science. The survey covered over 21 lakh students across 781 districts, highlighting regional disparities and urgent challenges in school education.

About PARAKH RS:

- PARAKH (Performance Assessment, Review, and Analysis of Knowledge for Holistic Development) is a national competency-based student assessment aligned with the National Education Policy (NEP) 2020. It aims to standardize evaluation and provide actionable data on learning outcomes.

Key Findings:

- Grade 3: Only 55% could correctly order numbers up to 99; 54% understood basic multiplication; 60% could read and comprehend short texts.
- Grade 6: Only 38% could solve real-life math problems; 44% could identify environmental elements; 56% understood local institutions' functions.
- Grade 9: Merely 28-31% applied percentage and fractions in daily life; 37% understood basic science concepts; 54% could extract key ideas from texts.

Regional Performance:

- Top performers include Punjab, Kerala, Himachal Pradesh, Chandigarh, and Dadra & Nagar Haveli-Daman & Diu. Low-performing districts are primarily in Meghalaya, Arunachal Pradesh, Jammu & Kashmir, and Jharkhand. Kendriya Vidyalayas showed mixed results, with weak math scores in Grade 3 but strong language skills in Grade 9.

Concerns:

- Learning deficits increase with higher grades, especially in conceptual subjects.
- Urban-rural and regional inequities persist, affecting foundational literacy and numeracy.
- Public and aided schools underperform, reflecting gaps in teaching quality and resources.

Government Initiatives:

- NEP 2020: Emphasizes foundational literacy and numeracy by Grade 3, experiential learning, and equitable education.
- NIPUN Bharat Mission: Targets universal foundational skills by 2026-27 through teacher training and activity-based learning.
- Samagra Shiksha Abhiyan: Integrates quality improvement from pre-primary to Class 12, focusing on inclusivity and gender parity.
- Digital Platforms: DIKSHA, PM e-Vidya, and TALA use technology for learning, assessment, and teacher capacity building.

Way Forward:

- Implement targeted remedial programs and localized teaching strategies in low-performing regions.
- Strengthen teacher training with a focus on competency-based education.
- Use PARAKH data at district levels for informed policy action.
- Transition from rote learning to competency-based assessments aligned with NEP 2020.

6. North Eastern Region District SDG Index

Context: NITI Aayog, in collaboration with the Ministry of Development of North Eastern Region (MoDoNER) and technical support from UNDP, released the second edition of the North Eastern Region (NER) District Sustainable Development Goals (SDG) Index for 2023-24. This index assesses the progress of 121 districts across the eight Northeastern states on key SDG indicators, aiding evidence-based policy making at the grassroots level.

About the NER District SDG Index:

- It builds on the methodology of NITI Aayog's national SDG India Index.
- Districts are classified as Achiever (score = 100), Front Runner (65-99), Performer (50-64), and Aspirant (<50).
- The 2023-24 edition covers 92% of districts in the region and monitors social, economic, and environmental dimensions of development.

Key Findings:

- 85% of NER districts fall under the Front Runner category, up from 62% in the previous edition, showing significant improvement.
- Mizoram's Hnahthial district tops the region with a score of 81.43; Arunachal Pradesh's Longding scores lowest at 58.71.
- Mizoram, Sikkim, and Tripura have all districts in the Front Runner category, with no Aspirants or Achievers.
- Sikkim shows the most consistent district-wise performance, while Mizoram and Nagaland display larger intra-state disparities.

Significance:

- The index supports localized SDG implementation, enabling targeted interventions to bridge development gaps.
- It fosters cooperative federalism by aligning district-level development with national goals under India's Viksit Bharat @2047 vision.
- Encourages resource mobilization and stakeholder participation at the local level.

Challenges:

- Financial limitations and competing budget priorities may restrict sustainability projects.
- Balancing economic growth with environmental goals is complex at local levels.
- Data quality and availability remain concerns for accurate monitoring.

Way Forward:

- Strengthen local governance and leverage innovative financing to tailor SDG strategies.
- Use district-level data to customize development policies, reduce disparities, and promote inclusive growth.
- Integrate local initiatives with national programs like Rashtriya Gram Swaraj Abhiyan and state schemes for holistic development.

7. TALASH Initiative

Context: The Ministry of Tribal Affairs, in collaboration with UNICEF India, has launched the TALASH initiative—a national program aimed at the all-round development of tribal students studying in Eklavya Model Residential Schools (EMRSs).

About TALASH:

- TALASH stands for Tribal Aptitude, Life Skills, and Self-Esteem Hub. It is India's first digital platform dedicated to fostering self-awareness, life skills, and career clarity specifically among tribal youth. Implemented by the National Education Society for Tribal Students (NESTS), TALASH targets over 1.38 lakh students across 28 states and 8 Union Territories.

Objectives:

- Promote self-discovery and personality development.
- Facilitate informed career choices through aptitude-based psychometric assessments.
- Build essential life skills such as emotional intelligence, communication, and decision-making.
- Train and equip teachers for better student mentoring.

Key Features:

- **Psychometric Assessments:** Inspired by NCERT's Tamanna initiative, these assessments identify student strengths and generate personalized Career Cards recommending suitable career options.
- **Career Counselling:** Helps students align their aspirations with aptitudes for well-informed decisions.
- **Life Skills Modules:** Focus on confidence-building, problem-solving, emotional management, and resilience.
- **Teacher Training Portal:** Offers resources and capacity-building programs to educators to support student growth effectively.

Significance:

- TALASH bridges educational and emotional gaps in tribal education by leveraging technology for personalized learning. It directly supports the National Education Policy (NEP) 2020's vision

of inclusive and holistic education. The initiative also ensures access for students in remote tribal areas, promoting equitable development.

HISTORY & CULTURE

1. Rath Yatra of Lord Jagannath

Context: The annual Rath Yatra of Lord Jagannath held in Puri, Odisha, is one of the largest and most celebrated religious festivals in India. Drawing over 30 lakh devotees, it symbolizes the journey of the deities from the Jagannath Temple to the Gundicha Temple. The event showcases Odisha's rich cultural heritage and religious traditions while emphasizing inclusiveness and public participation. Given its scale, the festival involves extensive security and management efforts.

About Rath Yatra

- Location: Puri, one of the four sacred Char Dhams of Hinduism.
- Deities: Lord Jagannath (form of Vishnu), Lord Balabhadra, and Devi Subhadra.
- Timing: Celebrated annually on the 2nd day of Ashadha Shukla Tithi (Odia calendar), usually in late June or early July.
- Significance: Marks the nine-day sojourn of the deities from Jagannath Temple to their aunt's (Goddess Ardhāsini/Mausima) abode, the Gundicha Temple.
- Inclusiveness: Allows all devotees, including non-Hindus, to witness the deities outside the temple, symbolizing Lord Jagannath's outreach beyond traditional boundaries.
- Spiritual Belief: According to Bamadeva Samhita and Hindu mythology, witnessing the Rath Yatra cleanses sins and grants salvation (Baikuntha).

Key Rituals of Rath Yatra

- Chhera Panhara: The Gajapati King of Puri sweeps the chariot floors with a golden broom, symbolizing humility, equality, and dignity of labour.
- Pahandi: Ceremonial procession where the deities are brought out of the temple and placed on their chariots.
- Bahuda Yatra: The return journey of the deities from Gundicha Temple back to the Jagannath Temple on the 10th day of Ashadha Shukla Paksha.
- Suna Besha: The deities are adorned with gold ornaments after returning, a grand spectacle at the Lion's Gate.
- Niladri Bije: Marks the homecoming of the deities, concluding the Rath Yatra with rituals that reinstate them inside the sanctum.
- Rasagola Divas: Celebrated on Niladri Bije day, offering sweets to Goddess Laxmi to appease her for being left behind during the chariot journey.

Jagannath Temple: Architecture and Importance

- Built in the 12th century by King Anantavarman Chodaganga Deva of the Eastern Ganga dynasty.
- Exemplifies Kalinga style of architecture with distinctive features like Pancharatha (five chariots) and elevated platforms.
- The wooden idols of Lord Jagannath and siblings are periodically replaced in sacred rituals.
- Known as the "White Pagoda," the temple holds spiritual significance as Yamanika Tirtha, where the power of Yama, the god of death, is believed to be nullified, symbolizing divine protection.

2. Ancient India's Chola Dynasty and Its Legacy

Context: The Chola Dynasty was a dominant Tamil empire in South India from the 9th to the 13th centuries CE. Renowned for its military strength, naval power, cultural achievements, and advanced governance, the Chola legacy continues to inspire modern India's vision of development, unity, and democratic governance.

Overview of the Chola Dynasty

- Period: Circa 9th to 13th centuries CE.
- Founder: Vijayalaya Chola.
- Peak rulers: Rajaraja I and Rajendra I.

- Territory: Extended from the Maldives in the south to the Ganges basin in the north, including Southeast Asian colonies.
- Contributions: Military conquests, maritime dominance, Dravidian temple architecture, bronze sculpture art, literature, and administrative innovations.

Key Achievements

- **Maritime and Military Power**

- ✓ Built a formidable navy securing trade routes across the Bay of Bengal and Southeast Asia.
- ✓ Naval expedition against Srivijaya (Sumatra) expanded influence beyond India.
- ✓ Rajendra Chola I's northern campaigns reached the Ganges River, symbolizing imperial strength.

- **Administrative Innovations**

- ✓ Early form of grassroots democracy through the Kudavolai System (ballot pot elections).
- ✓ Local self-governance via village assemblies (Sabha for Brahmins, Ur for non-Brahmins).
- ✓ Stringent eligibility criteria ensured transparency and civic integrity in public offices.
- ✓ Revenue administration was efficient, with detailed land surveys and equitable taxation.

- **Cultural and Architectural Legacy**

- ✓ Constructed iconic temples such as the Brihadesvara Temple at Thanjavur and Gangaikonda Cholapuram.
- ✓ Patronized Tamil literature and Shaivite devotional movements.
- ✓ Advanced bronze sculpting techniques produced masterpieces like the Nataraja.
- ✓ Cultural diplomacy extended Indian influence across Southeast Asia, visible in monuments like Angkor Wat.

- **Water Management**

- ✓ Developed extensive irrigation systems, including the large Cholagangam tank, supporting agriculture and urban centres.

Democratic Traditions: Kudavolai System

- Candidates selected by lottery from a vetted list, ensuring fairness.
- Public drawing of lots by an impartial child ensured transparency.
- Disqualified those with criminal records, debt, or ethical violations.
- Annual audits and strict accountability maintained governance standards.

Modern Relevance

- PM Modi highlighted the Chola legacy as a blueprint for modern India's development, emphasizing unity, democratic decentralization, and maritime security.
- The dynasty's governance system parallels modern Panchayati Raj institutions, demonstrating India's long-standing tradition of local self-rule.
- Their naval prowess inspires contemporary India's Indo-Pacific strategy and blue economy initiatives.
- Cultural unity promoted by the Cholas is reflected in modern government efforts like the Kashi Tamil Sangamam.

Limitations

- The Chola democracy excluded women, landless labourers, and lower castes, reflecting social hierarchies of the time.

3. Maratha Military Landscapes Added to UNESCO World Heritage List

Context: In July 2025, the "Maratha Military Landscapes of India" were inscribed on the UNESCO World Heritage List, marking India's 44th site to receive this global recognition. This inclusion highlights the architectural brilliance and strategic military heritage of the Maratha Empire from the 17th to 19th centuries CE.

About Maratha Military Landscapes

- Period: 17th to 19th centuries CE.
- Composition: A network of twelve forts spread across Maharashtra and Tamil Nadu.

- Significance: Demonstrates the Maratha rulers' strategic military vision, innovative fort architecture, and adaptation to diverse geographical terrains.

Key Forts Included

- Hill Forts: Salher, Shivneri, Lohgad, Raigad, Rajgad (Maharashtra), and Gingee (Tamil Nadu).
- Hill-Forest Fort: Pratapgad (dense woods).
- Hill-Plateau Fort: Panhala.
- Coastal Fort: Vijaydurg (shoreline).
- Island Forts: Khanderi, Suvarnadurg, Sindhudurg (surrounded by sea).

Strategic and Cultural Importance

- The forts collectively exhibit a sophisticated military system tailored to different landscapes, including hills, forests, plateaus, islands, and coasts.
- They represent defensive innovations and regional adaptation strategies essential to Maratha warfare and control.
- These forts are linked to significant historical events, including battles that shaped Indian history.

Protection and Management

- Many forts such as Shivneri, Raigad, and Gingee are protected by the Archaeological Survey of India (ASI).
- Others like Salher and Rajgad come under the Directorate of Archaeology and Museums, Maharashtra.
- Inclusion in the UNESCO list aids in conservation efforts and boosts cultural tourism.

UNESCO Selection Criteria

- Sites must possess outstanding universal value and meet at least one of the ten criteria defined by UNESCO.
- The Maratha Military Landscapes were recognized for their exceptional testimony to the military and architectural heritage of the Maratha Empire.
- India has been a member of the World Heritage Committee since 2021, contributing to global heritage preservation.

MISCELLANEOUS

1. Henley Passport Index 2025

Context: India's passport ranking has improved from 85th (2024) to 77th (2025), granting visa-free or visa-on-arrival access to 59 destinations.

About the Index:

- **Definition:** Global ranking of passports based on the number of destinations accessible without a pre-arranged visa.
- **Publisher:** Henley & Partners, using data from the International Air Transport Association (IATA) and in-house research.
- **Coverage:** 199 passports, 227 destinations.
- **Update:** Quarterly.

Criteria:

- Visa-free, visa-on-arrival, and electronic travel authorization are considered.
- Global Rankings (2025):
 - ✓ 1st: Singapore – 193 destinations.
 - ✓ 2nd: Japan, South Korea – 190 destinations.
- Lowest: Afghanistan – 25 destinations.
- Notable trends: UAE rose from 42nd to 8th in a decade; USA dropped to 10th, UK to 6th.

India's Performance:

- Rank: 77th (Best – 71st in 2006; Lowest – 90th in 2021).
- Visa-Free: 59 countries (newly added: Philippines, Sri Lanka).
- Visa-on-Arrival: Sri Lanka, Myanmar, Indonesia, Macau, etc.

- Reasons for Improvement: Stronger bilateral ties, digital visa facilitation, expanding economic influence.

2. Swachh Survekshan Awards 2024–25

Context: President of India conferred the Swachh Survekshan 2024–25 awards, the world’s largest urban cleanliness survey conducted by MoHUA under the Swachh Bharat Mission–Urban (SBM-U).

Key Highlights

- **Population-based Classification (First Time):**
 - ✓ Million Plus Cities: >10 lakh
 - ✓ Big Cities: 3–10 lakh
 - ✓ Medium Cities: 50,000–3 lakh
 - ✓ Small Cities: 20,000–50,000
 - ✓ Very Small Cities: <20,000
- **Awards Structure (78 Awards in 4 Categories):**
 - ✓ Super Swachh League (New): For consistent top performers (e.g., Indore, Surat, Navi Mumbai) – excluded from regular rankings.
 - ✓ Top 3 Cities in Each Category: Ahmedabad, Bhopal, Lucknow led in their respective tiers.
 - ✓ Special Awards:
 - Swachh Mahakumbh 2025: Prayagraj
 - Cleanest Ganga Town: Prayagraj
 - SafaiMitra Surakshit Shehar: Visakhapatnam, Jabalpur, Gorakhpur
 - Cleanest Cantonment: Secunderabad
 - ✓ Promising Clean Cities Awards: 34 cities across States/UTs.
- **New Initiatives:**
 - ✓ Swachh City Partnership: 78 top cities to mentor poor-performing cities in their States.
 - ✓ Accelerated Dumpsite Remediation Program: One-year drive to clear legacy waste and enhance scientific waste processing.

About Swachh Survekshan:

- Launched: 2016 (MoHUA) under SBM-U.
- Coverage: Expanded from 73 cities (2016) to 4,589 ULBs (2025).
- Evaluation: Waste segregation & processing, sanitation in public spaces, citizen feedback; verified by third-party agencies.
- 2025 Framework: 10 simplified indicator sections; focus on high-footfall areas; includes school-level assessments.

Swachh Bharat Mission (SBM):

- Launched: 2 Oct 2014.
- Phases:
 - ✓ SBM-Gramin: ODF by 2019; Phase-II targets ODF+ by 2024–25.
 - ✓ SBM-Urban 2.0 (2021): Garbage-free cities, faecal sludge & plastic waste management, greywater treatment.
- Funding: CSR & philanthropic support via Swachh Bharat Kosh.

3. Meri Panchayat App

Context: Awarded WSIS Prizes 2025 Champion Award in Cultural and Linguistic Diversity at WSIS+20 High-Level Event, Geneva.

Recognized as a model for grassroots digital governance in rural India.

About:

- Type: Mobile-based m-Governance platform for rural areas.
- Developed by: Ministry of Panchayati Raj & National Informatics Centre (NIC), Ministry of Electronics & IT.
- Purpose:
 - ✓ Promote digital inclusion in rural governance.
 - ✓ Enhance transparency, accountability & participatory democracy.

✓ Bridge information gaps at Gram Panchayat level.

Key Features:

- Real-time Data: Panchayat budgets, receipts, payments, development plans.
- Civic Engagement: Gram Sabha agendas & decisions; GPDPs; citizens can propose, review & rate projects.
- Geo-Features: Geo-tagging/fencing for works & grievance redressal.
- Weather & Assets: Panchayat-level forecasts & civic infrastructure details.
- Social Audit Tools: Fund utilization transparency.
- Multilingual: Supports 12+ Indian languages.

Global Recognition:

- Awarded by: ITU, UNESCO, UNDP, UNCTAD.
- Category: Cultural Diversity & Local Content.
- Significance: Demonstrates ICT use for inclusive, accountable rural governance in line with WSIS sustainable development objectives.

TELANGANA CURRENT AFFAIRS

1. Digital Governance Push in Telangana – MeeSeva Expansion

Context: Telangana has added Market Value Certification and Online Marriage Registration with slot booking to its MeeSeva e-governance platform, aiming to enhance transparency, efficiency, and citizen convenience.

MeeSeva Overview:

- Meaning: “At Your Service” – Integrated Government-to-Citizen (G2C) and Business-to-Citizen (B2C) platform.
- Objective: Deliver multiple government services through a single digital interface, reducing physical interaction and delays.

New Services Introduced:

- Market Value Certification
- Quick land/property valuation for legal and financial transactions.
- Application online or via MeeSeva centres; processed by Sub-Registrar Office (SRO) within 24 hours.
- Online Marriage Registration with Slot Booking
- Upload documents (photos, proof of residence, age).
- Book slots for SRO verification to avoid delays and overcrowding.

Broader E-Governance Context:

- Existing integrations: Road Transport Authority, PAN services, sand booking system.
- Future plans:
 - T-Fiber rollout for statewide high-speed internet.
 - More MeeSeva kiosks in rural/remote areas.
 - Expansion to additional government services.

Significance:

Dimension	Impact
Governance	Enhances transparency, reduces red tape.
Citizen Service	Saves time, offers home/nearby access.
Inclusivity	Benefits rural & underprivileged populations.
Efficiency	Eliminates procedural delays and intermediaries.

2. Tiger Translocation to Kawal Tiger Reserve

Context: Telangana Forest Department, in collaboration with Maharashtra, plans to translocate tigers from Tadoba–Andhari Tiger Reserve (TATR) to Kawal Tiger Reserve (KTR) under Project Tiger, with NTCA approval pending.

Kawal Tiger Reserve (KTR):

- Location: Northern Telangana (Mancherial, Adilabad, Nirmal, Kumaram Bheem Asifabad districts).
- Declared: 2012; currently has no resident tigers (NTCA, 2022).
- Features: Dense forests, abundant prey (spotted deer, sambar, nilgai), but lacks breeding pairs and territorial stability.
- Recent Measures: Grassland development, relocation of villages (Maisampet, Rampur).

Tadoba–Andhari Tiger Reserve (TATR):

- Location: Chandrapur, Maharashtra.
- Tiger Population: 40+ individuals.
- Connectivity: Tigers migrate via Kagaznagar corridor but face barriers to reaching KTR's core zone.

Proposed Translocation Plan:

- Number: 5 tigers (1 male, 4 females) to ensure genetic diversity and breeding potential.
- Aim: Establish founder population, revive predator–prey balance, and stabilise KTR's ecosystem.

Challenges:

- Habitat Connectivity: Fragmented corridors, especially near Pranahita river.
- Human–Wildlife Conflict: Need for community sensitisation and fair compensation.
- Monitoring & Protection: Radio-collaring, continuous tracking, anti-poaching measures.
- Adaptation & Territorial Behaviour: Ensuring adequate space and ecological suitability.

Significance:

Dimension	Impact
Conservation	Revives dormant tiger reserve, aids species recovery.
Ecology	Restores predator–prey dynamics.
Federal Cooperation	Strengthens inter-state conservation efforts.
Project Tiger Goals	Expands and stabilises tiger populations.
Sustainable Relocation	Demonstrates planned community resettlement for conservation.

Way Forward:

- NTCA approval and adherence to translocation protocols.
- Continued habitat and buffer zone enhancement.
- Community engagement through eco-development.
- Long-term scientific monitoring and periodic review post-breeding cycles.

3. Telangana Sports Policy 2025

Context: Telangana launched the Sports Policy 2025 to position the state as a national hub for sporting excellence, integrating infrastructure, athlete welfare, education, and public-private partnerships (PPP).

Objectives:

- Make Telangana a leader in sports excellence.
- Build an inclusive and sustainable sports ecosystem.
- Embed sports into education and lifestyle.
- Attract private investment in infrastructure.
- Support athletes from grassroots to elite levels.

Salient Features:

- Cash Incentives (Olympic & Paralympic):
 - ✓ ₹6 crore (Gold), ₹4 crore (Silver), ₹2.5 crore (Bronze).
- Sports Hub of Telangana:
 - ✓ Central body for policy implementation, infrastructure, education, and funding.
 - ✓ Governed by a multidisciplinary Board of Governors.
- PPP Model:
 - ✓ Private role in building/maintaining venues.
 - ✓ Up to 30% site use for commercial activities for financial viability.
 - ✓ Facilities accessible to grassroots & elite athletes.
- Annual Sports Awards:
 - ✓ Recognition for athletes, coaches, schools, corporate partners, and journalists.
- Consolidated Tournament Calendar:
 - ✓ Linked with Chief Minister's Cup for district-level competitive structure.

Education Integration:

- Sports & physical literacy part of school/college curriculum.
- Mandatory student participation.
- Collaboration with Education Department & YIPESU for structured programs.

Digital Outreach & Campaigns:

- Online platforms to promote participation and reach rural areas.
- Partnerships with sports icons for awareness drives.

Veteran Athlete Welfare:

- Pensions for retired athletes/coaches.
- Career transition into coaching/mentoring.

Significance:

- Economic & Social: Boosts youth engagement, attracts infrastructure investment.
- Inclusivity: Equal focus on Paralympics, rural outreach, and school-level access.
- Institutional Reform: Strategic governance via Sports Hub.
- National Alignment: Complements Khelo India & Fit India Movement.

4. Empowering SHG Women through Rural Internet Services – Telangana's T-Fibre Model

Context: Telangana is set to empower Self-Help Group (SHG) women by entrusting them with the operation and maintenance of rural internet services under the T-Fibre initiative, aligning with Digital India and women's economic empowerment goals.

Background:

- T-Fibre (Telangana Fibre Grid): State initiative under BharatNet to deliver high-speed broadband to every rural household.
- Uses Mission Bhagiratha's pipeline network for cost-effective optical fibre deployment.
- Currently operational in government offices, schools, and gram panchayats.

New Initiative – SHGs as Digital Service Providers:

- SHG women to handle:
 - ✓ Household internet connections.
 - ✓ Line maintenance & troubleshooting.
 - ✓ Service delivery to public institutions.
 - ✓ Community digital assistance.
- Pilot phase: Began Dec 2024 in Peddapalli, Sangareddy, and Narayanpet.
- Scaling up: Statewide SHG takeover of local T-Fibre operations.

Support Measures:

- Finance: ₹5 lakh StreeNidhi loan per SHG.
- Affordable pricing: 4G/5G internet @ 20 Mbps for ₹300/month.
- Monitoring: Command Control Centres for service quality oversight.

- Digital services: Bill payments, UPI transactions, e-governance access, e-commerce, online education, and telemedicine.

Significance:

- Women’s Economic Empowerment – High-value livelihood opportunities, income generation, and improved social status.
- Rural Digital Inclusion – Internet access in remote villages enabling education, healthcare, and governance services.
- Decentralised Governance – Local management reduces burden on state machinery and fosters community ownership.
- Policy Alignment – Supports Digital India, National Broadband Mission, National Policy on Women 2016, and Gram Panchayat Digitisation.

5. Elevated Corridors in Secunderabad

Context: The Ministry of Defence (MoD) and Telangana Government signed an MoU to construct two elevated corridors in Secunderabad, exchanging defence and state land to ease traffic congestion.

Project Overview:

- **Corridors:**
 - ✓ Paradise Junction–Shamirpet (SH-01) – 18.14 km
 - ✓ Paradise Junction–Dairy Farm Road (NH-44) – 5.32 km
- Implementing Agency: Hyderabad Metropolitan Development Authority (HMDA).
- Mode: Public–Private Partnership (PPP).
- MoU Scope: Defines land exchange modalities, timelines, and responsibilities.

Land Transfer:

From	To	Purpose
MoD	State Govt.	Construction of corridors on A1 defence land
State Govt.	MoD	Augment defence land bank

Significance:

- **Traffic Decongestion:** Bypass routes to reduce load on ground roads in Secunderabad Cantonment.
- **Strategic & Civilian Use:** Supports both defence and civilian movement.
- **Regional Connectivity:** Faster access from northern Telangana towns (Medchal, Shamirpet, Karimnagar) to Hyderabad.
- **Urban Infrastructure Modernisation:** Aligns with National Infrastructure Pipeline and urban mobility goals.

Legal & Administrative Aspects:

- A1 Defence Land: Reserved for operational/training use; civilian projects need MoD clearance.
- MoU: Legally binding framework for land swap and project execution.
- PPP Model: Private sector participation in financing, design, construction, and maintenance.

6. PARAKH Rashtriya Sarvekshan 2024 – Telangana’s Improvement in Learning Outcomes

Context: Telangana has exited the bottom-10 performing States in student learning outcomes as per PARAKH Rashtriya Sarvekshan 2024 conducted by NCERT.

About PARAKH Rashtriya Sarvekshan:

- Conducted by NCERT, Ministry of Education, every 3 years.
- Formerly known as National Achievement Survey (NAS).
- Assesses Grades 3, 6, and 9 in subjects like Language and Mathematics.
- 2024 cycle covered 21 lakh students across 781 districts in 28 States and 8 UTs.

Telangana’s Performance:

- State Rankings (2024): Grade 3 – 26th (36th in 2021), Grade 6 – 26th, Grade 9 – 17th.

- Districts: Jangaon in top 50 nationally; Wanaparthy, Bhadradri Kothagudem, Mulugu in bottom 50.
- Subject-wise: +10 percentage points in Language & Mathematics for Grade 3.
- Government schools outperformed private and central schools at foundational level.

Key Reform Drivers:

- Teacher Deployment: Promotions/transfers ensured optimal placement.
- Capacity Building: Regular training and academic support.
- Foundational Literacy & Numeracy (FLN): Strengthened early-grade reading and arithmetic.
- Monitoring: Frequent assessments and feedback loops.

Significance:

- Equity in Education: Reduced gap between govt and private school performance.
- Policy Impact: Validates targeted teacher-focused interventions.
- Post-COVID Recovery: Signs of reversing early learning loss.
- Data-Driven Governance: Enables evidence-based curriculum and teaching reforms.

7. Telangana Cabinet Decisions

Context: In July 2025, the Telangana Cabinet approved 42% reservation for Backward Classes (BCs) in local body elections, along with major decisions on employment, education, irrigation, and rural development.

Key Highlights:

- **BC Reservation in Local Bodies**

- ✓ 42% quota for BCs in upcoming local body polls.
- ✓ Based on caste survey data; anchored in Kamareddy BC Declaration (2024) and Congress' poll promise.
- ✓ Amendment to Telangana Panchayat Raj Act, 2018, to be introduced.
- ✓ Impact: Greater grassroots representation, decentralised governance, and empowerment of marginalised communities.

- **Employment Generation**

- ✓ Target: 1 lakh government jobs by March 2026.
- ✓ 60,000 filled; recruitment underway for 17,084; 22,033 new notifications soon.
- ✓ Addresses youth unemployment and strengthens administrative capacity.

- **Higher Education Expansion**

- ✓ Approval for Amity University and St. Mary Rehabilitation University.
- ✓ 50% seats reserved for local students.
- ✓ St. Mary's to focus on skill-based, industry-ready programmes.

- **Irrigation Projects**

- ✓ Priority to incomplete projects with 98% expenditure done but pending benefits.
- ✓ Focus on resolving land acquisition issues and ensuring water delivery to farms.

- **Animal Husbandry & Fisheries**

- ✓ New policy for 300 Goshalas; model Goshala at Yadagirigutta.
- ✓ Release of 82 crore fishlings to boost fisheries sector and rural livelihoods.

8. Telangana Revises RTE Section 12(1)(C) Implementation

Context: The Telangana government has modified its application of Section 12(1)(C) of the Right to Education Act, 2009, limiting the 25% reservation in private unaided non-minority schools to habitations without a government school within 1 km.

Key Features:

- **Conditional Enforcement:**

- ✓ RTE quota applies only where no public school exists within a 1 km radius.
- ✓ 96 areas identified – 50 rural and 46 urban – with immediate rollout in 28 rural and 33 urban localities.

- **Rationale:**

- ✓ Reinforces the RTE's original intent as a supplementary measure.
- ✓ Prioritises strengthening public schools over blanket reliance on private institutions.

- **Institutional Measures:**

- ✓ Plans to set up 212 rural and 359 urban government primary schools.
- ✓ Committee to fix per-child reimbursements and transport allowances.
- ✓ Dedicated monitoring body under RTE Rules, 2010.

Significance:

- Optimises public school infrastructure use.
- Reduces unnecessary financial burden on the state.
- Aligns with NEP 2020 focus on foundational learning through public investment.

9. Justice Aparesh Kumar Singh Appointed Chief Justice of Telangana High Court

Context: Justice Aparesh Kumar Singh, former Chief Justice of Tripura High Court, has been appointed as the new Chief Justice of the Telangana High Court.

Background:

- Appointment Authority: President of India, in consultation with the Chief Justice of India and the Governor of the concerned state (Article 217).
- Transfer Provision: Article 222 allows transfer of High Court judges between states to maintain judicial balance and national integration.

Profile of Justice Singh:

- Executive Chairman, Jharkhand State Legal Services Authority (2021–present).
- Acting Chief Justice, Jharkhand High Court (Dec 2022 – Feb 2023).
- Chief Justice, Tripura High Court (April 2023 – Aug 2025).

Significance:

- Brings rich judicial and administrative experience to Telangana's judiciary.
- Strengthens federal spirit and the all-India character of the higher judiciary.
- Critical role ahead in handling constitutional issues, urban development disputes, and PILs in Telangana.

About Telangana High Court:

- Established: 1 Jan 2019 post bifurcation from the common Andhra Pradesh–Telangana High Court.
- Location: Hyderabad.
- Jurisdiction: Entire state of Telangana.

10. Krishna–Godavari Water Dispute Resolution

Context: Andhra Pradesh and Telangana have reached a breakthrough agreement on Krishna and Godavari river water management during a meeting chaired by Union Jal Shakti Minister C.R. Patil in New Delhi.

Key Decisions:

- **Telemeter Installation:** Real-time monitoring of water outflows from reservoirs into canals to ensure transparency and prevent unilateral withdrawals.
- **Srisailem Dam Protection:** Recognised as Telugu heritage; repair and plunge pool protection works to follow CWC recommendations.
- **River Management Board HQs:**
 - ✓ KRMB in Amaravati (Andhra Pradesh).
 - ✓ GRMB in Hyderabad (Telangana).
- **Joint Committee on Polavaram–Banakacherla Link Project:**
 - To assess technical feasibility, environmental impact, and utilisation of surplus Godavari waters (~3,000 TMC ft/year).
 - Supervised by CWC.

Significance:

- Cooperative Federalism: First major consensus between AP and Telangana since bifurcation; fosters collaboration over conflict.
- Telugu Unity: Bipartisan approach beyond political rivalry.
- Centre as Facilitator: Demonstrates constructive federal mediation role.

11. Kumurambheem Conservation Reserve Proposal

Context: Telangana has paused its plan to establish the Kumurambheem Conservation Reserve, a proposed tiger corridor linking Kawal Tiger Reserve (Telangana) with Tadoba–Andhari Tiger Reserve (Maharashtra).

Background:

- Proposal (GO No. 49, May 30, 2025): Convert 1.49 lakh ha of forest land in Kumurambheem–Asifabad district into a protected area.
- Objective: Enhance tiger movement and habitat connectivity.
- Coverage: Forest ranges of Asifabad, Kerameri, Rebbena, Tiryani, Kagaznagar, Sirpur, Karjelli, Bejjur, Penchikalpet.

Concerns Raised:

- **Tribal Displacement:** Risk to over 330 tribal villages, affecting Adivasi livelihoods (podu cultivation, NTFP, grazing).
- **Legal Violations:**
 - ✓ PESA Act, 1996 – Requires Gram Sabha consent in Scheduled Areas.
 - ✓ Forest Rights Act, 2006 – Protects forest dwellers’ rights.
- **Lack of Consultation:** No Gram Sabha meetings held before the proposal.

Significance of the Pause:

- Affirms Tribal Rights: Respects constitutional protections under the Fifth Schedule.
- Balances Ecology & Rights: Recognises need for conservation without undermining livelihoods.
- Democratic Responsiveness: Reflects state’s attention to grassroots protests.

12. Veer Parivar Sahayata Yojana (VPSY) 2025 – Free Legal Aid for Defence Families

Context: On 27 July 2025, Telangana inaugurated its first Free Legal Services Clinic for defence personnel and their families under the Veer Parivar Sahayata Yojana 2025 at the Sainik Welfare Office, Somajiguda, Hyderabad.

About the Scheme:

- Launched by: National Legal Services Authority (NALSA) under the guidance of Supreme Court Judge Justice Surya Kant.
- State Implementing Agency: Telangana State Legal Services Authority (TSLSA) in coordination with the Sainik Welfare Department.

Objective:

- Provide free legal assistance to serving/retired defence personnel, paramilitary forces, ex-servicemen, and their families.
- Address legal issues in civil disputes, pensions, service matters, and family disputes.
- Bridge the justice-access gap for personnel posted in remote areas.
- Promote legal literacy among defence families.

Key Features:

- Beneficiaries: Defence and paramilitary personnel (serving/retired) & their families.
- Staffing: Panel lawyer + trained paralegal volunteer.
- Operation Days: 1st & 4th Saturdays every month.
- Services: Civil and service-related matters, legal documentation, pension disputes.
- Expansion: Clinics planned in all district HQs with awareness campaigns.

Significance:

- Addresses Legal Isolation: Helps personnel serving in inaccessible zones manage legal matters locally.

- Empowers Defence Families: Provides cost-free, professional legal support to often underrepresented dependents.
- Strengthens Civil–Military Integration: Integrates welfare and justice systems for the armed forces community.
- Awareness Generation: Improves knowledge of rights and entitlements.

ANDHRA PRADESH CURRENT AFFAIRS

1. 'Digi-Lakshmi' Scheme

Context:

Andhra Pradesh has initiated the Digi-Lakshmi scheme aimed at digitally empowering women from urban impoverished backgrounds. In alignment with the "One Family, One Entrepreneur" vision, a total of 9,034 women-operated Common Service Centres (CSCs) are set to be established throughout all Urban Local Bodies.

- G.O. MS No. 117 (June 30, 2025) was issued by the Principal Secretary of MA&UD.
- A total of 9,034 standardized ATOM kiosks are to be established in each Urban Local Body (ULB).
- Operators are required to be members of Self-Help Groups (SHGs), aged between 21 and 40, married, residing locally, possessing a minimum of three years of active participation in SHGs, and holding a graduate degree.
- The rollout, training, and support will be managed by the Mission Director of MEPMA.

Services Offered: Each Common Service Centre (CSC) is expected to deliver approximately 250 public services, which will include bill payments, issuance of certificates, and registrations for welfare programs.

Financial & Training Support

- MEPMA will assist in providing loans ranging from ₹2 to ₹2.5 lakh per centre to cover hardware, setup, and working capital expenses.
- Comprehensive operational training will be conducted by CSC e-Governance Services India Ltd.

Conclusion:

Digi-Lakshmi connects digital gaps and fosters women's entrepreneurship by empowering SHG members to provide essential public services in their communities, thereby enhancing both income opportunities and service provision.

2. Sakambari Utsavams:

1. Modern Revival and Ritual Authenticity:

- The modern celebration of Sakambari Utsavams in Vijayawada began in 2007 at Indrakeeladri, inspired by the historic Bhadrakali celebrations in Warangal.
- Priests and Vedic scholars meticulously studied Warangal's traditions to faithfully implement the festival in Vijayawada, ensuring both continuity and authenticity in ritual practices.

2. Divine Feminine and Verdant Imagery:

- Sakambari Devi embodies the nurturing, nourishing aspect of the Divine Feminine, as the provider of food and vegetation.
- The festival dramatically highlights this through the complete adornment of the temple and processional idols with green decorations—vegetables, leaves, and flowers—representing her "harita" (lush, verdant) form and her compassion for all life.

3. Central Role of Vegetables and Kadambam Prasadam:

- Fresh vegetables are both the primary offering and focal decoration: on the inaugural day, approximately 50 tonnes are donated by farmers from the local region.
- These are used to adorn the sanctum and are transformed into "Kadambam," a special prasadam made from rice, red gram, and the donated produce, which is distributed freely to devotees.

4. Agrarian and Communal Participation:

- The festival is deeply intertwined with the region’s agrarian ethos.
- Local farmers, families, and patrons actively participate by donating vegetables and volunteering, reinforcing community bonds and celebrating the vital importance of agriculture to the region’s culture and sustenance.

5. Cultural Impact and Enduring Popularity:

- Over nearly two decades, Sakambari Utsavams has become a hallmark cultural event for Vijayawada.
- The festival is renowned for its scrupulous adherence to scriptural guidelines, the continuous distribution of Kadambam throughout the day, and the striking green decor.
- This has established it as a highly anticipated fixture in the city’s religious and cultural calendar, drawing large crowds and strengthening traditions annually.

3. Guntur will be made poverty-free district through P4

Guntur district will be made poverty-free through the implementation of the P4 initiative—Public Private People Partnership—a collaborative model that brings together governmental bodies, private donors, and the community to eradicate poverty.

Key Points:

- **P4 Framework:** The P4 (Public Private People Partnership) model integrates support from the government, private sector, and local communities to address poverty. It emphasizes collaboration—both in policy design and practical delivery—leveraging resources and expertise from all sectors.
- **Adoption and Mentoring of Families:** A key component is the identification and adoption of ‘Bangaru Kutumbalu’ (model families), who are linked to mentors (from business, civil society, or government) for direct support and development planning. Successful households are expected to become examples for others, fostering local models of success.
- **Community and Donor Engagement:** Local business leaders and philanthropists are encouraged to adopt villages or families, providing financial aid, employment opportunities, education, and health benefits. For example, business leaders in Guntur have already donated funds for infrastructure and adopted families to help them become economically self-reliant.
- **Structured Beneficiary Identification:** Only families meeting specific economic criteria (not already wealthy or owning significant land/assets) qualify as beneficiaries, ensuring targeted impact. Large-scale surveys are underway to identify eligible households and customize interventions.
- **Program Scope and Accountability:** The district administration, elected representatives, and departmental heads conduct regular reviews to monitor progress. There are also calls to expedite related welfare initiatives—such as crop loans, compensation payouts, and support for tenant farmers—to complement core poverty eradication efforts under P4.

Implementation began in early 2025 as a flagship effort under the Andhra Pradesh government, with Guntur selected for pilot and scale-up based on community, government, and private sector readiness.

4. Swachh Survekshan 2025: Andhra Pradesh’s Municipal Champions:

- Five AP municipal corporations will receive Swachh Survekshan 2025 awards from President Droupadi Murmu in New Delhi on July 17, recognising top performers in cleanliness and sanitation.
- **Vijayawada Municipal Corporation** topped the “more than 10 lakh population” category, **Guntur Municipal Corporation** led the 3–10 lakh bracket, and **Tirupati Municipal Corporation** won in the 50,000–3 lakh segment.
- **Greater Visakhapatnam Municipal Corporation** earned the Ministerial Award (Special Category), while **Rajahmundry Municipal Corporation** secured the Ministerial Award at the state level.
- Swachh Andhra Corporation Chairman K. Pattabhiram hailed the wins as proof that the Swachh Andhra Movement is delivering tangible results across urban centres.

- The awards also shine a spotlight on the daily efforts of sanitary workers, whose dedication keeps AP's cities clean and hygienic.

5. Andhra Pradesh Artificial Reef Initiative:

Context: On May 19, Agriculture, Marketing and Fisheries Minister K. Atchannaidu inaugurated the deployment of 22 artificial-reef (AR) units off Jalari Yendada (Visakhapatnam), marking Phase I installations across Srikakulam, Vizianagaram and Visakhapatnam districts, with plans to roll out ARs along the entire AP coastline.

- **Economy:** By boosting local fish stocks and diversifying coastal livelihoods, the AR project is set to increase incomes for fisherfolk, reduce reliance on imported seafood and generate new opportunities in reef-related tourism and service sectors.
- **Environment:** ARs restore degraded seabed habitats, accelerate coral colonization and enhance marine biodiversity, helping to offset the impacts of coastal pollution and natural reef decline.
- **Fisheries Sustainability:** By providing structured shelter and feeding grounds, artificial reefs improve juvenile survival rates, attract migratory species for breeding and feeding, and support long-term stock replenishment.
- **Community Livelihoods:** Strengthening nearshore ecosystems directly benefits fishing communities by stabilizing catches, fostering collaborative management, and opening avenues for allied activities such as seaweed farming.
- **Policy & Governance:** A phased, multi-stakeholder rollout—led by the Fisheries Department in partnership with ICAR-CMFRI, NTPC and local bodies—ensures adaptive scaling, monitoring and alignment with Andhra Pradesh's broader coastal restoration and aquaculture goals.

6. ISRO's Vision for Future Space Milestones:

- **Ambitious timelines for autonomy:** India will build its own space station by 2035 and execute an independent crewed lunar mission—sending an astronaut to the Moon and returning them safely—by 2040.
- **Strengthening innovation and research:** Under V. Narayanan's leadership, ISRO is cementing India's reputation as a global space power through sustained emphasis on cutting-edge technologies.
- **Expanding mission portfolio:** Preparations are underway for a Venus orbiter, alongside numerous rocket and satellite launches—bolstered by active participation from domestic space startups.
- **Remarkable growth trajectory:** From its early days of bicycle-transported rockets to today's sophisticated launch vehicles, ISRO aims to match any leading space agency by 2040.
- **Nurturing talent pipeline:** At the IITDM convocation, 206 degrees were conferred (183 B.Tech., 19 M.Tech., 4 Ph.D.), reinforcing the skilled workforce that will drive India's space ambitions.

7. Rushikonda Blue Flag Beach: Five Key Takeaways from the Minister's Inspection

- **Ensuring Sustainable Upkeep:** Minister Kandula Durgesh directed closer coordination between officials and elected representatives to maintain and manage all Blue Flag amenities at Rushikonda.
- **Blue Flag Certification Restored:** After temporary withdrawal due to maintenance complaints, the Denmark-based Foundation for Environmental Education has reinstated Rushikonda's Blue Flag status.
- **Addressing Stakeholder Concerns:** The Minister pledged to resolve pressing issues raised by beach vendors and lifeguards, ensuring their operations and safety infrastructure are fully supported.
- **Beautification and Tourist Appeal:** Plans include ₹24 lakh-worth of beautification works, introduction of double-decker bus services on Beach Road, and enhancement of washrooms, changing rooms and greywater treatment to boost footfall.

- **Reviving Cruise Liner Operations:** To further enrich the coastal tourism offering, cruise liner services will run four times by September, with measures underway to extend operations year-round.

8. Andhra Pradesh–UAE Investment Opportunities:

- **Sectoral Focus:** Chief Minister N. Chandrababu Naidu pitched UAE investments in seaports, logistics, agriculture, shipbuilding, digital technologies, renewable energy, and tourism.
- **Investor Engagement Model:** Naidu invited Abdulla Bin Touq Al Marri to spend 25% of his time in AP, promising time-bound clearances under a new “Speed of Doing Business” framework.
- **Strategic Advantages:** Andhra Pradesh offers a 1,053 km coastline, a network of seaports, upcoming airports, robust rail and road connectivity, abundant water and arable land, plus skilled human resources.
- **Trade Relations & Partnerships:** Bilateral trade with the UAE reached \$1.45 billion last year; an MoU with Investopia was signed, and investors like DP World and a UK firm eye maritime and green ammonia projects.
- **Policy & Incentives:** The state has launched 15 sector-specific policies, a slew of fiscal and non-fiscal incentives, and aligns with the Viksit Bharat vision to fast-track investor support.

9. Legacy of Chola dynasty provides road map for modern India: PM Modi

- **Strategic Military Strength:** Prime Minister Modi underscored the Cholas’ powerful navy and defense forces, calling on modern India to bolster maritime capabilities as a pillar of national security.
- **Administrative Excellence:** The dynasty’s efficient governance and unity across its realms serve as a blueprint for streamlined public administration and cohesive policy implementation today.
- **Cultural and Architectural Grandeur:** Monumental projects like the Brihadisvara Temple and the urban design of Gangaikonda Cholapuram exemplify how cultural patronage and civic planning can elevate societal identity.
- **Economic and Trade Innovations:** Chola-era trade networks, resource management, and infrastructure development drove prosperity, highlighting lessons for contemporary economic strategy and export growth.
- **Symbolic Inspiration and National Vision:** Commemorative coins and forthcoming statues of Rajaraja and Rajendra Chola will reinforce historical consciousness, inspiring unity, core values, and ambition on India’s path to development.

10. Andhra Pradesh–Singapore Urban Collaboration:

- **Housing Collaboration:** Naidu urged Singapore’s Housing Development Board to partner on Andhra Pradesh’s flagship urban housing projects, particularly the new capital at Amaravati, leveraging HDB’s planning expertise.
- **Sustainable Design Insights:** The Chief Minister’s visit to the 250-acre Bidadari Estate showcased “City in a Garden” principles—integrating greenery, water conservation, and community spaces without sacrificing natural resources.
- **Vision for Amaravati:** Andhra Pradesh aims to build Amaravati as a world-class, people-centric capital, combining sustainability, affordability, and innovation in its master plan, informed by Singapore’s best practices.
- **Restoring Trust and Transparency:** Acknowledging past policy strains, Naidu emphasized this mission to rebuild government-to-government trust, ensuring open communication and accountability in all joint projects.
- **Investment Roadshow & Sector Opportunities:** At the A.P.–Singapore Business Forum, Naidu positioned Andhra Pradesh as a secure investment destination, highlighting aerospace, defence, agri-tech, semiconductors, logistics, and tourism.

PRACTICE MCQ's

1. With reference to the Preamble to the Constitution of India, consider the following statements:

1. The words "Socialist" and "Secular" were inserted during the National Emergency of the 1970s.
2. In Kesavananda Bharati (1973), the Supreme Court held these words to be part of the Basic Structure.

Which of the above statements is/are correct?

- (a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Correct Answer: (a) 1 only

Explanation:

- **Statement 1 – Correct:** The words "Socialist" and "Secular" were not part of the original Preamble of 1950. They were inserted by the **42nd Constitutional Amendment Act, 1976**, which was enacted **during the National Emergency (1975–77)** proclaimed under Article 352.
- **Statement 2 – Incorrect:** Kesavananda Bharati v. State of Kerala was decided in **1973**, before the 42nd Amendment. While the Court held that the **Preamble is part of the Constitution** and elements like its ideals form part of the **Basic Structure**, it could not have specifically ruled on "Socialist" and "Secular" because they were not yet in the text.

2. Consider the following pairs related to Parliamentary procedures:

Term	Description
1. Adjournment sine die	: Termination of a session of the Parliament by the President.
2. Prorogation	: Temporary suspension of a sitting by the presiding officer. : End of the term of the Rajya Sabha, which is a permanent house.
3. Dissolution	

How many of the pairs given above are correctly matched?

- (a) Only one pair
(b) Only two pairs
(c) All three pairs
(d) None of the pairs

Answer: (d)

Explanation:

- Pair 1 is incorrectly matched. Adjournment sine die means ending a sitting for an

indefinite period, and it is done by the presiding officer, not the President.

Prorogation is the termination of a session by the President.

- Pair 2 is incorrectly matched. Prorogation is the termination of a session by the President. Adjournment is the temporary suspension of a sitting by the presiding officer.
- Pair 3 is incorrectly matched. Dissolution applies only to the Lok Sabha, as the Rajya Sabha is a permanent house and not subject to dissolution.

3. With reference to the Anti-Defection Law in India, consider the following statements:

Assertion (A): The 91st Amendment Act, 2003, significantly strengthened the Anti-Defection Law.

Reason (R): This amendment removed the provision that allowed exemption from disqualification in case of a 'split' involving one-third of a party's legislators.

Select the correct answer using the code given below:

- (a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, but R is not the correct explanation of A.
(c) A is true, but R is false.
(d) A is false, but R is true.

Answer: (a)

Explanation:

- Assertion (A) is true. The 91st Amendment made it harder for legislators to defect without penalty.
- Reason (R) is also true and is the correct explanation for A. By removing the 'split' provision (which required only one-third of members) and retaining only the 'merger' provision (requiring two-thirds support), the amendment made large-scale defections more difficult, thus strengthening the law.

4. Regarding China's construction of a megadam on the Brahmaputra (Yarlung Zangbo) river, which of the following statements is/are correct?

1. China and India have a binding international water-sharing treaty that governs the flow of the Brahmaputra river.
2. More than 80% of the Brahmaputra river's flow originates from the Chemayungdung Glacier in Tibet.

3. As a countermeasure, India is developing the Upper Siang Multipurpose Project in Arunachal Pradesh to act as a strategic buffer.

Select the correct answer using the code given below:

- (a) 1 and 2 only
(b) 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (b)

Explanation:

- Statement 1 is incorrect. The document explicitly states that China is not a party to any binding international river treaty with India, leaving India with limited legal recourse.
- Statement 2 is incorrect. Although the river originates in Tibet, Tibet's contribution to the total flow is only about 30-35%. India contributes over 80% of the flow through rainfall and snowmelt in its territory.
- Statement 3 is correct. India is developing the 11.2 GW Upper Siang dam in Arunachal Pradesh as a strategic buffer to regulate floods and store water.

5. Consider the following statements about the Carbon Credit Trading Scheme (CCTS) in India:

1. The legal basis for the CCTS is provided by the Environment (Protection) Act, 1986.
2. The Bureau of Energy Efficiency (BEE) acts as the regulator for the scheme, while the Central Electricity Regulatory Commission (CERC) is its administrator.
3. The scheme allows sectors not covered under the compliance framework to earn tradable credits through voluntary emission reduction projects.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
(b) 3 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (b)

Explanation:

- Statement 1 is incorrect. The CCTS is empowered by the Energy Conservation (Amendment) Act, 2022.
- Statement 2 is incorrect. The roles are reversed. The Bureau of Energy Efficiency (BEE) is the administrator, and the Central Electricity Regulatory Commission (CERC) is the regulator.
- Statement 3 is correct. The scheme has a compliance framework for mandated entities and a voluntary offset option for other sectors to register projects and earn credits.

6. With reference to the NISAR satellite, consider the following statements:

1. It is the first satellite to use dual-frequency L-band and S-band Synthetic Aperture Radar (SAR) from a single platform.
2. The S-band SAR payload is a contribution from NASA, while the L-band SAR is from ISRO.
3. The satellite operates in a Sun-synchronous orbit, allowing it to map the entire globe every 12 days.

How many of the statements given above are correct?

- (a) Only one
(b) Only two
(c) All three
(d) None

Answer: (b)

Explanation:

- Statement 1 is correct. NISAR is the first satellite to use dual-frequency SAR (L-band and S-band) on a single platform.
- Statement 2 is incorrect. The L-band SAR is provided by NASA, and the S-band SAR is provided by ISRO.
- Statement 3 is correct. The satellite is in a 743 km Sun-synchronous orbit and has a 12-day repeat cycle for global coverage.
- Thus, two statements (1 and 3) are correct.

7. Which of the following statements about the "Maratha Military Landscapes of India," recently inscribed on the UNESCO World Heritage List, is correct?

- (a) It is a single, large fort in Maharashtra recognized for its strategic importance under Shivaji Maharaj.
- (b) It comprises a series of twelve forts located exclusively in the hilly regions of the Western Ghats in Maharashtra.
- (c) The recognition is for a network of forts that showcases a military system adapted to diverse terrains, including hills, coasts, and islands.
- (d) The site includes forts in Maharashtra and Gujarat, representing the full extent of the Maratha Empire.

Answer: (c)

Explanation:

- Option (a) is incorrect. It is a network of twelve forts, not a single one.
- Option (b) is incorrect. The forts are not just in the hills; they include coastal, island, and hill-plateau forts. Also, one fort, Gingee, is in Tamil Nadu, not exclusively Maharashtra.
- Option (c) is correct. The inscription recognizes the network for demonstrating a military system adapted to diverse

geographical terrains like hills, forests, plateaus, coasts, and islands.

- Option (d) is incorrect. The included forts are in Maharashtra and Tamil Nadu, not Gujarat.

8. Consider the following pairs concerning the constitutional provisions for the Vice-President of India:

Article	Provision
1. Article 64	Lays down the procedure for the election of the Vice-President.
2. Article 65	Provides for the Vice-President to act as President during a vacancy.
3. Article 67	Establishes the Vice-President as the ex-officio Chairman of the Rajya Sabha.

How many of the pairs given above is/are correctly matched?

- (a) Only one pair
- (b) Only two pairs
- (c) All three pairs
- (d) None of the pairs

Answer: (a)

Explanation:

- Pair 1 is incorrectly matched. Article 64 states the Vice-President is the ex-officio Chairman of the Rajya Sabha. The election process is detailed in Article 66.
- Pair 2 is correctly matched. Article 65 empowers the Vice-President to act as President in case of a vacancy, for a maximum of six months.
- Pair 3 is incorrectly matched. Article 67 deals with the term of office, resignation, and removal of the Vice-President. The provision for the ex-officio Chairman is in Article 64.
- Therefore, only one pair is correctly matched.

9. Consider the following statements about the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES):

1. CITES is a legally binding treaty on member parties, but its implementation requires the creation of national laws.
2. The CITES secretariat is administered by the International Union for Conservation of Nature (IUCN).
3. India was a founding member of CITES when it came into force in 1975.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (a)

Explanation:

- Statement 1 is correct. CITES is binding on the Parties, but it is implemented through their respective national legislation.
- Statement 2 is incorrect. The CITES Secretariat is administered by the United Nations Environment Programme (UNEP). The IUCN provides scientific and technical support.
- Statement 3 is incorrect. While CITES came into force in 1975, India ratified it in 1976.
- Therefore, only one statement is correct.

10. With reference to the India-EFTA Trade and Economic Partnership Agreement (TEPA), consider the following statements:

Assertion (A): The TEPA is expected to significantly boost foreign direct investment (FDI) inflows into India.

Reason (R): The agreement includes a binding commitment from EFTA countries to invest \$100 billion in India over 15 years and facilitate the creation of 1 million jobs.

Select the correct answer using the code given below:

- (a) Both A and R are true, and R is the correct explanation of A.
- (b) Both A and R are true, but R is not the correct explanation of A.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

Answer: (a)

Explanation:

- Assertion (A) is true. The TEPA is designed to strengthen investment inflows.
- Reason (R) is also true and is the correct explanation for A. A key and unique feature of this FTA is the binding commitment by EFTA to invest \$100 billion in FDI over 15 years, directly supporting the assertion that it will boost FDI.

11. Which of the following statements regarding the recent use of CRISPR-Cas9 in Japonica rice by NIPGR scientists is/are correct?

1. The genetic modification was done on Japonica rice, a variety predominantly cultivated in the cooler temperate and subtropical regions of Asia.
2. The modified rice plants demonstrated a significant increase in yield while using only a fraction of the recommended phosphate fertilizer.

Select the correct answer using the code given below:

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (c)

Explanation:

- Statement 1 is correct. The study used Japonica rice, which is grown in cooler zones like Japan, China, and Korea.
- Statement 2 is correct. The study found a 40% yield increase with only 10% of the recommended fertilizer dose.

12. With reference to the Supreme Court's recent ruling on inheritance rights for tribal women, consider the following statements:

1. The Hindu Succession Act, 1956, including its 2005 amendment, is universally applicable to all citizens of India, including members of Scheduled Tribes.
2. The Supreme Court, in Ram Charan v. Sukhram (2025), affirmed that tribal women possess equal rights to ancestral property in the absence of a proven customary law that denies such rights.
3. The verdict established that to claim property rights, tribal women must first prove they have abandoned their customary laws and adopted Hindu practices.

Which of the statements given above is/are correct?

- (a) 2 only
- (b) 1 and 2 only
- (c) 3 only
- (d) 1 and 3 only

Answer: (a)

Explanation:

- Statement 1 is incorrect. The Hindu Succession Act, 1956, explicitly excludes Scheduled Tribes unless the Central Government notifies otherwise.
- Statement 2 is correct. The court ruled that denial of rights violates Articles 14 and 15, and in the absence of a specific custom forbidding it, women's inheritance rights must be protected based on "justice, equity, and good conscience".
- Statement 3 is incorrect. The verdict explicitly rejected the "test of Hinduisation," which required tribal women to prove they had abandoned their customs.

13. Consider the following pairs of recently introduced Bills and their primary objectives:

Bill

Objective

1. National Sports Governance Bill, 2025

To provide a statutory framework for sports administration, replacing the non-statutory Sports Code of 2011.

2. National Anti-Doping (Amendment) Bill, 2025

To provide statutory backing to the World Anti-Doping Agency (WADA) in India.

3. Bills of Lading Bill, 2025

To replace the colonial-era Indian Bills of Lading Act, 1856, and align maritime trade law with global standards.

How many of the pairs given above are correctly matched?

- (a) Only one pair
- (b) Only two pairs
- (c) All three pairs
- (d) None of the pairs

Answer: (b)

Explanation:

- Pair 1 is correctly matched. The Bill aims to replace the older, non-statutory Sports Code (2011) with a robust legal framework.
- Pair 2 is incorrectly matched. The Bill aims to provide statutory backing to India's National Anti-Doping Agency (NADA) and the National Dope Testing Laboratory (NDTL), not WADA.
- Pair 3 is correctly matched. The Bill replaces the 1856 Act to modernize the legal framework for maritime commerce and align it with global standards.
- Therefore, two pairs are correctly matched.

14. Regarding the 17th BRICS Summit 2025 held in Rio de Janeiro, consider the following statements:

1. The summit led to the admission of Indonesia as a new full member of the bloc.
2. The final declaration of the summit supported the principle of securitizing climate change to enforce compliance.
3. During the summit, India agreed to use the Chinese Yuan for settling payments for Russian oil to strengthen de-dollarization efforts.

How many of the statements given above are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

Answer: (a)

Explanation:

- Statement 1 is correct. Indonesia joined as a full member during the summit.
- Statement 2 is incorrect. The Rio de Janeiro Declaration explicitly stated opposition to the securitization of climate change.
- Statement 3 is incorrect. The document clearly states that India rejected Yuan settlement for Russian oil, signaling resistance to Chinese currency dominance.
- Therefore, only one statement is correct.

15. Consider the following statements regarding air pollution in India:

Assertion (A): Secondary pollutants, formed through atmospheric chemical reactions, are a significant contributor to PM_{2.5} pollution in India.

Reason (R): Ammonium sulphate, a major secondary pollutant, is primarily formed from the interaction of Sulphur Dioxide (SO₂) released from industries and Ammonia (NH₃) from agricultural sources.

Select the correct answer using the code given below:

- (a) Both A and R are true, and R is the correct explanation of A.
(b) Both A and R are true, but R is not the correct explanation of A.
(c) A is true, but R is false.
(d) A is false, but R is true.

Answer: (a)

Explanation:

- Assertion (A) is true. A CREA study found that secondary pollutants like ammonium sulphate contribute nearly 34% of PM_{2.5} pollution in India.
- Reason (R) is also true and correctly explains A. Secondary pollutants are formed from reactions of primary pollutants. The key pathway mentioned is SO₂ (from coal combustion) reacting with NH₃ (from fertilizer use) to form ammonium sulphate, (NH₄)₂SO₄.

16. With reference to the administration of the Chola Dynasty, which of the following statements is/are correct?

1. The Cholas pioneered a system of local self-governance through village assemblies known as 'Ur' and 'Sabha'.
2. The 'Kudavolai' system was an advanced method of electing representatives to these assemblies using a form of ballot.
3. The democratic processes of the Chola era were highly inclusive, ensuring equal participation for women, landless individuals, and all castes.

Select the correct answer using the code given below:

- (a) 1 only
(b) 1 and 2 only
(c) 2 and 3 only
(d) 1, 2 and 3

Answer: (b)

Explanation:

- Statement 1 is correct. The Cholas had a system of local self-governance through village assemblies like the Sabha (for Brahmins) and the Ur (for non-Brahmins).
- Statement 2 is correct. The Kudavolai system was a ballot pot method used for elections, which involved drawing lots to select candidates, ensuring transparency.
- Statement 3 is incorrect. The document explicitly mentions that Chola democracy had limitations and excluded women, landless labourers, and lower castes.

17. Consider the following statements regarding the National Cooperative Policy 2025:

1. The policy aims to replace the earlier policy from 2002 and sets a vision for cooperative-led growth until the year 2045.
2. A key feature is the establishment of 'Model Cooperative Villages', with a target of five such villages in every administrative district of India.
3. The policy primarily focuses on strengthening traditional sectors like agriculture and dairy, without venturing into diversification.

How many of the statements given above are correct?

- (a) Only one
(b) Only two
(c) All three
(d) None

Answer: (a)

Explanation:

- Statement 1 is correct. The policy is anchored in the vision "Sahkar se Samridhi," replaces the 2002 policy, and has a long-term vision until 2045.
- Statement 2 is incorrect. The target is to host 5 such villages in every tehsil, not every district.
- Statement 3 is incorrect. The policy explicitly includes diversification across more than 25 economic sectors as a key pillar.
- Therefore, only one statement is correct.

18. With respect to the proposed tiger translocation to the Kawal Tiger Reserve (KTR) in Telangana, which of the following statements is correct?

- (a) The plan involves moving tigers from KTR to Tadoba-Andhari Tiger Reserve (TATR) in Maharashtra to manage overpopulation in Kawal.
- (b) The translocation aims to genetically diversify the already stable and breeding tiger population within KTR.
- (c) A significant impediment to the natural migration of tigers into KTR's core area is the fragmentation of the corridor near the Pranahita river.
- (d) The National Tiger Conservation Authority (NTCA) has already given its final approval, and the translocation was completed in early 2025.

Answer: (c)

Explanation:

- Option (a) is incorrect. The plan is to translocate tigers from TATR in Maharashtra to KTR in Telangana.
- Option (b) is incorrect. KTR currently has no resident tigers, so the aim is to establish a founder population, not diversify an existing one.
- Option (c) is correct. The document highlights that tigers migrating from TATR face barriers, and the corridors are fragmented, especially near the Pranahita river, preventing them from reaching KTR's core zone.
- Option (d) is incorrect. The document states that NTCA approval for the translocation is still pending.

19. Consider the following statements regarding the 'Digi-Lakshmi' scheme launched in Andhra Pradesh:

1. The scheme aims to establish Common Service Centres (CSCs) operated by women in all Urban Local Bodies (ULBs).
2. Any woman who is a member of a Self-Help Group (SHG) is eligible to become a CSC operator under this scheme.
3. The scheme is implemented in rural areas to bridge the digital divide, aligning with the "One Village, One Entrepreneur" vision.

How many of the statements given above are correct?

- (a) Only one
(b) Only two
(c) All three

(d) None

Answer: (a)

Explanation:

- Statement 1 is correct. The scheme aims to establish 9,034 women-operated CSCs throughout all Urban Local Bodies (ULBs).
- Statement 2 is incorrect. There are specific eligibility criteria for operators, including age (21-40 years), marital status, local residency, SHG participation (minimum 3 years), and education (graduate degree).
- Statement 3 is incorrect. The scheme targets urban impoverished backgrounds and is implemented in ULBs, not rural areas. The vision mentioned is "One Family, One Entrepreneur".

20. With reference to the Supreme Court's advisory jurisdiction under Article 143 of the Constitution of India, consider the following statements:

1. The opinion given by the Supreme Court on a Presidential Reference is not binding in nature.
2. The Supreme Court may decline to give an opinion if the matter is considered unsuitable, such as being a purely political question.

Which of the above statements is/are correct?

- (a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Correct Answer: (c)

Explanation:

- **Statement 1 – Correct:** Under **Article 143**, the President can refer certain matters to the Supreme Court for its advisory opinion. Such an opinion is **advisory in nature** and not legally binding on the President or other authorities.
- **Statement 2 – Correct:** The Supreme Court has **discretion** to refuse giving an opinion on a Presidential Reference. For instance, in the **Special Reference No. 1 of 1993 (Ayodhya Reference)**, the Court declined to answer because it was a **purely political/religious issue** not suitable for judicial determination.