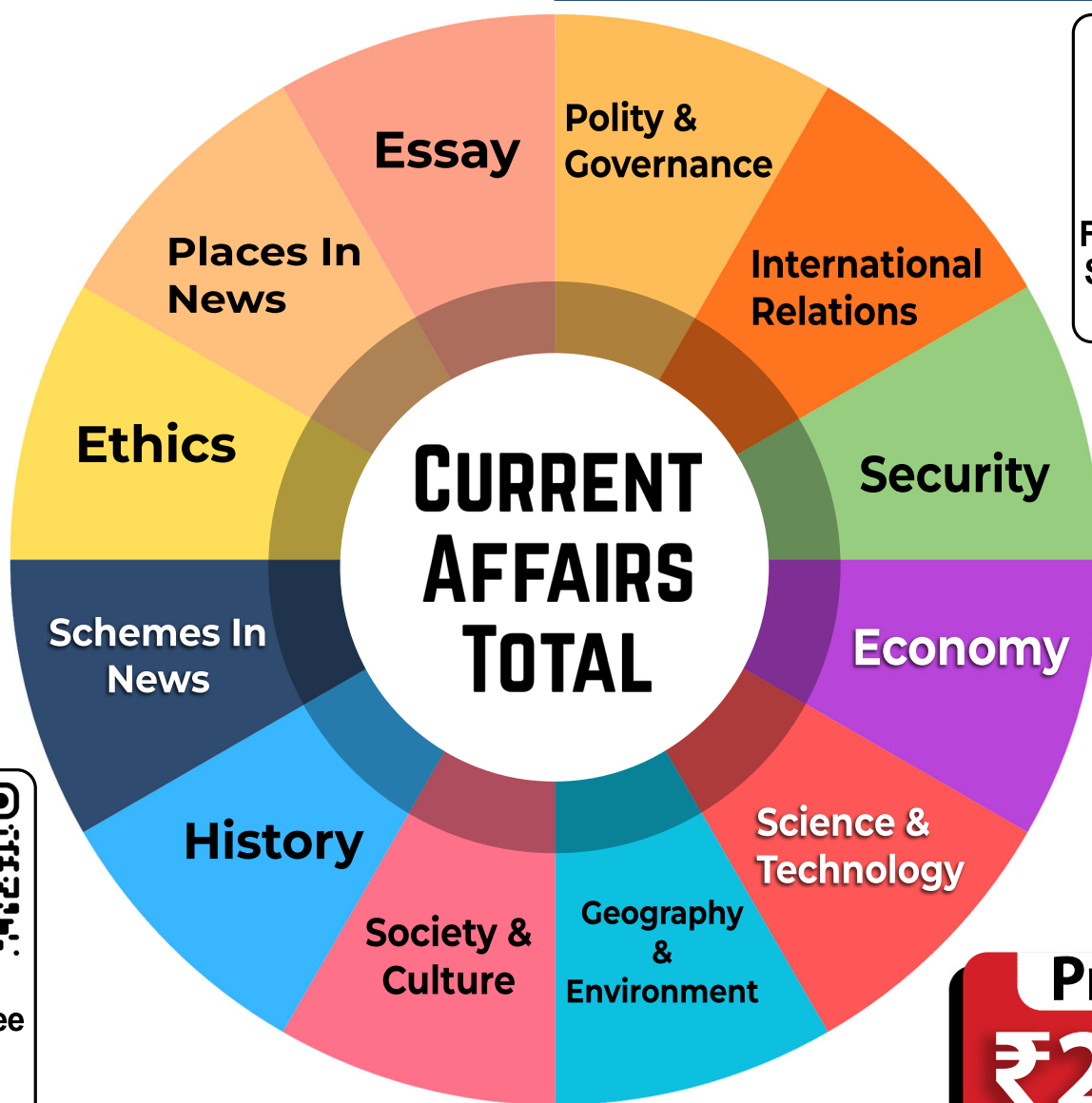




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POLITY & GOVERNANCE

1. Artificial Intelligence in Courts: Towards Responsible Adoption

Context

The Supreme Court has released the draft **Regulations for Use of Artificial Intelligence (AI) in Courts, 2026** for public consultation. The proposed framework seeks to regulate the use of AI in the judiciary while ensuring that judicial authority remains exclusively with judges.

Artificial Intelligence in the Judicial System

1. Artificial Intelligence (AI) refers to computer systems capable of performing tasks that normally require human intelligence, including learning, reasoning, and decision-making.
2. In the judiciary, AI is envisaged as a tool to improve efficiency and support administrative and research functions.

Applications of AI in the Judiciary

1. Legal research and precedent retrieval.
2. Document review and summarisation.
3. Case management and scheduling.
4. Transcription and translation of court proceedings, judgments, and legal records.

Global Developments

Several countries have adopted AI-assisted tools for legal research, document analysis, dispute resolution, and risk assessment, highlighting the growing role of AI in judicial administration.

Draft AI Regulations, 2026

Guiding Principle

1. AI shall function only in an assistive capacity.
2. The authority to determine questions of law, facts, sentencing, and justice shall remain exclusively with judicial officers.

Prohibited Uses

The draft regulations prohibit the use of AI for:

1. Judicial decision-making, adjudication, and sentencing.
2. Bail determination and risk assessment.
3. Predictive profiling of litigants, accused persons, witnesses, or lawyers.

4. Assessment of the credibility of parties or witnesses.
5. Deployment of opaque or unexplainable “black-box” AI systems in matters affecting legal rights or personal liberty.
6. AI-based surveillance, except where specifically authorised by law.

Safeguards

1. AI-assisted pleadings, documents, and evidence must be disclosed before courts.
2. Courts may seek details regarding the AI tools used, the extent of AI assistance, and the verification measures adopted before filing.
3. Personal data cannot be used to train, test, or refine AI systems without prior approval from the competent authority.
4. All AI applications must comply with the **Digital Personal Data Protection Act, 2023**.
5. AI systems must be designed and deployed in a fair, transparent, and non-discriminatory manner.
6. Special safeguards have been prescribed for women, children, persons with disabilities, minority communities, and economically disadvantaged groups.

Institutional Framework

The draft proposes a **Supreme Court-led oversight mechanism**, supported by AI Committees in the Supreme Court and all High Courts, to regulate and guide AI adoption in the judiciary.

Conclusion

The draft regulations represent an important step towards the responsible integration of AI into the judicial system. By limiting AI to an assistive role and establishing clear safeguards, the framework seeks to enhance judicial efficiency while upholding judicial independence, due process, and public trust in the administration of justice.

2. Criminal Procedure (Identification) Act, 2022: Strengthening Scientific Investigation and Criminal Identification

Context

The implementation of the **Criminal Procedure (Identification) Act, 2022** has accelerated across India, with law-enforcement agencies collecting and storing



DNA records in a centralized database maintained by the **National Crime Records Bureau (NCRB)**. The initiative seeks to strengthen forensic investigations and improve criminal identification through the use of advanced technologies.

Background

The **Criminal Procedure (Identification) Act, 2022** replaced the colonial-era **Identification of Prisoners Act, 1920**, which was largely restricted to fingerprints and footprints.

The Act was introduced to:

1. Modernise criminal investigations through advanced forensic and biometric technologies.
2. Improve the quality and reliability of evidence collection.
3. Facilitate effective tracking of offenders across jurisdictions.
4. Strengthen the criminal justice system through scientific methods.

Key Provisions

The Act authorises police and prison authorities to collect measurements from:

1. Convicted persons.
2. Individuals arrested for offences punishable with imprisonment of seven years or more.
3. Persons detained under preventive detention laws.

Measurements Covered

The Act permits the collection of:

1. Fingerprints and palm prints.
2. Footprints and photographs.
3. Iris and retina scans.
4. Biological samples, including blood and saliva for DNA profiling.
5. Signatures and handwriting samples.

Data Management Framework

1. Records are stored in a centralized database maintained by the **National Crime Records Bureau (NCRB)**.
2. Data may be retained for up to **75 years** from the date of collection.
3. Records are required to be destroyed when an individual is acquitted or discharged in all proceedings.

Institutional Framework

1. The system is accessible to state police organisations and prison authorities.
2. Central agencies such as the **Central Bureau of**

Investigation (CBI), National Investigation Agency (NIA), and Narcotics Control Bureau (NCB) are authorised to use the database.

3. Dedicated measurement collection units have been established across police districts and prisons to facilitate implementation.

National Automated Fingerprint Identification System (NAFIS)

The **National Automated Fingerprint Identification System (NAFIS)**, launched by the NCRB in 2022, serves as a key component of the identification framework.

Key features include:

1. Automated fingerprint matching and verification.
2. Nationwide access to fingerprint records.
3. Instant cross-state identification capabilities.
4. Facilitates identification of suspects across states and assists in the investigation of long-pending cases.

Technology-Enabled Investigation Framework

The CrPI framework integrates biometric, forensic, and digital technologies through:

1. A unified database containing fingerprints, facial images, iris scans, and biological records.
2. Automated matching of crime-scene evidence with existing records.
3. Photo-based identification of suspects.
4. Video analytics for processing CCTV footage.
5. Scientific tracking of repeat offenders and criminal networks.

Significance

1. Promotes evidence-based and technology-driven policing.
2. Enables faster and more accurate identification of suspects.
3. Improves coordination among law-enforcement agencies across jurisdictions.
4. Supports effective tracking of habitual and interstate offenders.
5. Reduces dependence on manual record verification.
6. Supports the transition towards a modern and technology-driven criminal justice system.

Challenges and Way Forward

Challenges	Way Forward
Privacy concerns arising from the collection of biometric and biological data.	Strengthen safeguards in line with the principles laid down in the Puttaswamy Judgment (2017).



Risk of misuse or unauthorised access to sensitive personal information.	Implement robust cyber-security measures, encryption standards, and controlled access protocols.
Limited judicial oversight over data collection.	Introduce independent oversight and stronger procedural safeguards.
Long retention period of records raises concerns regarding proportionality.	Periodically review retention policies and ensure timely deletion of records where required.
Variations in collection practices may affect data quality.	Establish uniform national standards and regular training programmes.
Possibility of contamination or mishandling of biological samples.	Strengthen chain-of-custody procedures and forensic laboratory practices.
Lack of transparency regarding database access and usage.	Conduct periodic audits and establish accountability mechanisms.
Inter-agency data integration challenges.	Improve interoperability between central and state-level databases.

Conclusion

The Criminal Procedure (Identification) Act, 2022 represents an important step towards integrating forensic science and digital technologies into criminal investigations. While the framework can enhance crime detection and investigative efficiency, its long-term effectiveness will depend on robust privacy safeguards, data security measures, judicial oversight, and adherence to constitutional principles.

3. Election Symbols in India: Rules Governing Their Allotment

Context

The recent debate over the possible use of a cockroach as a political symbol has drawn attention to the framework governing election symbols in India. Election symbols facilitate voter identification and constitute an important feature of India's electoral system.

Legal Framework

Election symbols are allotted by the Election Commission of India (ECI) under the **Election Symbols (Reservation and Allotment) Order, 1968**.

Categories of Symbols

1. **Reserved Symbols:** Reserved symbols are exclusively allotted to recognised national and state political

parties and serve as their permanent electoral identity.

2. **Free Symbols:** Free symbols are available to registered unrecognised political parties and independent candidates from a list notified by the ECI.

Parties and candidates may indicate their preferred symbols; however, the final decision regarding allotment rests with the Election Commission. In cases of competing claims, the Commission follows prescribed procedures, including a draw of lots where necessary.

Criteria for Allotment

The ECI generally prefers symbols that are simple, easily identifiable, and distinct from existing symbols. Consequently, the free-symbol list primarily consists of common objects and items familiar to voters.

Policy on Animal-Based Symbols

The Election Commission generally avoids allotting new animal-based symbols owing to concerns associated with their use during election campaigns. While parties that received such symbols earlier continue to retain them, the allotment of new animal-based symbols remains highly unlikely.

Consequently, a cockroach is unlikely to be approved as an election symbol for any newly registered political party.

Importance of Election Symbols

1. Facilitate voter identification, particularly in a diverse electorate.
2. Provide a distinct electoral identity to political parties.
3. Enhance accessibility for voters with limited literacy.
4. Promote clarity and efficiency in the electoral process.

Conclusion

Election symbols are a vital instrument of electoral communication in a diverse democracy. The Election Commission's regulatory framework seeks to ensure that symbols remain simple, recognisable, and accessible, thereby strengthening the conduct of free and fair elections.

4. Fundamental Right to Walk

Context

The Supreme Court recently held that the right to walk on safe and demarcated footpaths is a Fundamental Right under Part III of the Constitution. The Court also emphasised the need for a comprehensive legal framework to protect pedestrian rights and ensure safe mobility.

Constitutional Recognition

The Court recognised the right to walk as an integral component of:



1. **Article 19(1)(a):** Freedom of speech and expression.
2. **Article 19(1)(b):** Freedom of peaceful assembly.
3. **Article 19(1)(c):** Freedom of association.
4. **Article 19(1)(d):** Freedom of movement.
5. **Article 21:** Right to life and personal liberty.

The Court observed that walking is fundamental to individual mobility and enables the effective exercise of several constitutional freedoms. The judgment also expands the scope of **Article 21** by recognising safe pedestrian mobility as an essential component of a life with dignity.

Pedestrian Rights and State Obligations

The Court held that wherever a road exists, there is a corresponding obligation to provide safe pedestrian infrastructure.

Duty bearers include:

1. Urban Development Authorities
2. Municipal Corporations
3. Municipalities
4. Panchayats

Their responsibilities include:

1. Construction and maintenance of footpaths.
2. Prevention of encroachments.
3. Ensuring safe and accessible pedestrian movement.

The Court made these obligations judicially enforceable and affirmed that pedestrian rights take precedence over the convenience of motorised traffic. It also criticised vehicle-centric urban planning that often overlooks the needs of pedestrians.

Compensation and Legal Remedies

The Court enhanced compensation awarded to the victim's family and observed that the absence of footpaths and pedestrian crossings reflected systemic neglect of pedestrian safety.

It further held that individuals affected by:

1. Absence of footpaths,
2. Encroached pedestrian spaces, or
3. Unsafe walking infrastructure,

can seek constitutional remedies and compensation from public authorities, independent of remedies available under the **Motor Vehicles Act, 1988**.

Key Observations of the Court

1. Existing transport laws and urban planning frameworks have largely prioritised motorised traffic, resulting in inadequate recognition and protection of

pedestrian rights.

2. Walking facilitates the exercise of democratic freedoms by enabling expression, association, social interaction, and public participation.
3. Safe pedestrian infrastructure is essential for ensuring dignity, accessibility, and inclusive urban development.

Need for Reforms

The Court recommended:

1. Enactment of a dedicated law on pedestrian rights.
2. Clear identification of institutional responsibilities.
3. Effective grievance-redress mechanisms.
4. Protection and expansion of pedestrian infrastructure.
5. Establishment of a dedicated institutional mechanism for planning, monitoring, and enforcement of pedestrian rights.

Conclusion

The judgment marks a significant step towards people-centric urban governance by recognising safe pedestrian mobility as a constitutional entitlement. It reinforces the principles of dignity, accessibility, and inclusive development while promoting sustainable and equitable urban planning.

5. Passport and Proof of Citizenship

Context

On **Passport Seva Divas (24th June)**, the Ministry of External Affairs (MEA) clarified that an Indian passport is primarily a **travel document** and **not conclusive proof of Indian citizenship**. The clarification reaffirmed the legal distinction between **citizenship as a legal status** and **documents that merely provide evidence of it**.

Citizenship in India

1. **Legal Framework**
 - a. **Articles 5–11 of the Constitution** and the **Citizenship Act, 1955** govern Indian citizenship.
 - b. Citizenship is acquired through **birth, descent, registration, naturalisation or incorporation of territory**.
 - c. It is a legal status determined by law, and no single document is recognised as definitive proof of citizenship.
 - d. Government-issued documents provide evidence of citizenship but are **not conclusive proof in law**.
2. **MHA Clarification (2020)**
 - a. In a reply to Parliament, the Ministry of Home



Affairs (MHA) clarified that **Aadhaar, Passport, Voter ID, PAN Card and Birth Certificate** are **not legally designated as proof of citizenship**.

- b. Citizenship is determined strictly in accordance with the **Citizenship Act, 1955**.

Legal Status of a Passport

1. Passport as Evidence of Citizenship

- a. A passport is issued only after the government verifies an applicant's eligibility for Indian citizenship.
- b. However, it neither confers citizenship nor serves as conclusive proof if, citizenship is disputed before a competent authority or court.

2. Section 20 of the Passports Act, 1967

- a. **Section 20** empowers the Central Government to issue passports or travel documents to non-citizens in exceptional circumstances where public interest so requires.
- b. The provision enables the government to facilitate international travel for specified categories of non-citizens, including certain stateless persons, Tibetan refugees and Sri Lankan Tamil refugees.
- c. Thus, a passport is fundamentally a **travel document** and not a certificate of citizenship.

International Practice and Judicial Interpretation

1. International Practice

- a. Countries such as the **United Kingdom** and the **United States** issue passports only after verifying citizenship.
- b. They also maintain dedicated citizenship certificates and robust civil registration systems, making citizenship verification more streamlined.

2. Judicial Interpretation

- a. During hearings on **Bihar's Special Intensive Revision (SIR)** of electoral rolls, the Supreme Court observed that passports and birth certificates possess high evidentiary value but are **not conclusive proof of citizenship**.

Key Judicial Decisions

1. **Sarbananda Sonowal v. Union of India (2005)**: The burden of proving citizenship rests on the individual claiming it.
2. **State of Andhra Pradesh v. Abdul Khader (1962)**: A passport is relevant evidence, but citizenship must ultimately be determined on constitutional and statutory criteria.
3. **Bombay High Court (2013)**: Possession of documents

alone is insufficient unless the legal requirements for citizenship are satisfied.

National Register of Indian Citizens (NRC)

1. **Legal Framework**: The **Citizenship Rules, 2003** provide for:

- a. A **National Register of Indian Citizens (NRIC)**.
- b. National, State and Local Citizenship Registers.
- c. Issuance of citizenship identity cards.

2. **Aadhaar and NRC**

- a. The MHA has consistently maintained that **Aadhaar establishes identity and residence, not citizenship**.
- b. The proposed NRC was envisaged to create an authenticated database of Indian citizens.

3. **Assam NRC Experience**

- a. During the **Assam NRC (2015–2019)**, applicants had to establish links with legacy records predating **24 March 1971**.
- b. Nearly **19 lakh applicants** were excluded due to missing records, documentary inconsistencies and difficulties in establishing family lineage.
- c. The proposal for a nationwide NRC later became politically contentious, particularly after the **Citizenship (Amendment) Act (CAA)**.

Challenges and Way Forward

Challenges	Way Forward
Absence of a universal citizenship document: Citizens by birth are not issued a dedicated citizenship certificate, unlike those acquiring citizenship through registration or naturalisation.	Strengthen civil registration: Ensure universal birth registration and strengthen the Civil Registration System to maintain reliable citizenship records.
Fragmented documentary evidence: Citizenship is established through multiple official records, increasing the possibility of inconsistencies and disputes.	Integrate identity and citizenship databases: Develop a secure and interoperable digital framework with adequate privacy and data protection safeguards.
Legacy documentation gaps: Many older citizens continue to rely on incomplete or inconsistent records due to historically uneven civil registration.	Modernise record management: Digitise and standardise legacy records to improve accessibility and minimise documentation gaps.

Verification challenges: Documentary inconsistencies complicate citizenship verification, as reflected during the Assam NRC exercise.	Adopt a transparent verification mechanism: Establish a fair, legally robust and uniform process that upholds due process and natural justice.
Institutional limitations: The absence of a comprehensive citizenship database can lead to administrative disputes and legal uncertainty.	Safeguard constitutional rights: Ensure that citizenship verification mechanisms uphold privacy, transparency, accountability and constitutional guarantees.

Significance

1. Reinforces the distinction between **citizenship as a legal status** and **identity documents as supporting evidence**.
2. Highlights gaps in India's citizenship documentation framework.
3. Underscores the need for a transparent, reliable and rights-based citizenship verification mechanism.

Conclusion

The controversy highlights the need for a robust and transparent citizenship documentation framework. Strengthening civil registration, leveraging digital governance and ensuring fair verification mechanisms can improve administrative efficiency while upholding constitutional values and protecting the rights of genuine citizens.

6. Right to be Forgotten (RTBF) and Informational Privacy

Context

The **Delhi High Court** recently upheld the **Right to be Forgotten (RTBF)** and directed search engines and legal databases to restrict name-based access to certain judicial records, particularly in cases involving acquittal, discharge, quashing of proceedings, settlement, or purely private disputes.

Right to be Forgotten (RTBF): Meaning and Scope

1. The **Right to be Forgotten** refers to an individual's ability to seek the removal or de-indexing of personal information that has become outdated, irrelevant, or disproportionately prejudicial.
2. It does not entail deletion of records; rather, it restricts their visibility through name-based online searches.
3. The concept seeks to protect an individual's **privacy, dignity, reputation, and informational autonomy**

in the digital age.

Significance of the Delhi High Court Ruling

1. The Court observed that indefinite digital accessibility of judicial records may disproportionately affect an individual's **reputation, dignity, and future opportunities**, particularly where proceedings have ended in acquittal or closure.
2. It noted that online search results often amplify allegations and arrests while failing to adequately reflect acquittals or subsequent legal outcomes.
3. The Court recognised **informational autonomy** as an important aspect of privacy and held that individuals should have reasonable control over personal information that no longer serves a significant public purpose.
4. It emphasised the need to balance the principle of **open justice** with the protection of **privacy and dignity**.

Implications of the Delhi High Court Ruling

1. **Search Engines:** De-index name-based search results relating to acquittal, discharge, quashing of proceedings, settlement, and private disputes.
2. **Legal Databases:** Restrict name-based search functionality while retaining access through case number, citation, date, and court details.
3. **Courts:** Consider requests for masking names and personal identifiers in appropriate cases.
4. **Affected Individuals:** May seek further masking of personal details from the court concerned.

Constitutional Framework and Legal Position

1. The RTBF derives its constitutional foundation from the **Right to Privacy** under **Article 21** of the Constitution.
2. In the landmark **Justice K.S. Puttaswamy v. Union of India (2017)**, the Supreme Court recognised privacy as a fundamental right and affirmed the significance of informational privacy.
3. While the **Digital Personal Data Protection Act, 2023** addresses certain aspects of data protection, India still lacks a comprehensive statutory framework specifically governing the RTBF.

Challenges and Way Forward

Challenges	Way Forward
Absence of a dedicated legal framework governing the Right to be Forgotten	Enact a comprehensive statutory framework clearly defining the scope, limits, and procedure for RTBF claims



Balancing privacy rights with freedom of expression, open justice, and public interest	Develop clear and objective criteria for granting RTBF relief through a rights-based approach
Risk of arbitrary or inconsistent decisions in RTBF claims	Ensure judicial oversight and adopt case-specific assessment mechanisms
Inconsistent implementation across search engines, legal databases, and digital intermediaries	Establish uniform guidelines and standard operating procedures for all stakeholders
Long-term retention and rapid dissemination of personal information in the digital ecosystem	Strengthen data protection, privacy safeguards, and digital governance frameworks

Conclusion

The ruling marks an important step in adapting privacy rights to the realities of the digital age. By recognising the need to protect individuals from the enduring impact of outdated or irrelevant online information, it strengthens **informational privacy** while balancing the principles of **open justice** and **public interest**. A comprehensive statutory framework can ensure greater clarity, consistency, and accountability in the implementation of the **Right to be Forgotten** in India.

7. Nicobarese Tribal Councils and the Debate on Electoral Reforms

Context

The Andaman and Nicobar Administration has issued draft rules for elections to Nicobarese Tribal Councils, raising concerns over their impact on existing indigenous institutions.

About the Nicobarese

1. The Nicobarese are a Scheduled Tribe inhabiting the Nicobar Islands.
2. Their community institutions comprise Island Tribal Councils and village leaders known as Captains.
3. Community institutions function through collective deliberation rather than periodic electoral competition.

Key Features of the Draft Rules

1. Introduction of periodic elections for Village and Island Tribal Councils.
2. Preparation of electoral rolls and delimitation of constituencies.
3. Direct election of Chief Captains and reservation for women.
4. Establishment of a formal electoral framework for

tribal bodies.

Key Concerns

1. Formal electoral procedures may weaken consensus-based community institutions.
2. Tribal groups have questioned the adequacy of consultations before introducing the rules.
3. Administrative oversight provisions may limit the autonomy of Tribal Councils.
4. The proposal has attracted attention amid opposition to the Great Nicobar development project.

Significance

1. Highlights the challenge of balancing democratic institutionalisation with indigenous decision-making systems.
2. Raises questions regarding tribal autonomy, cultural preservation, and community participation in governance.
3. Reflects broader debates on the relationship between development initiatives and indigenous rights.

Conclusion

The controversy underscores the importance of designing governance reforms through meaningful consultation while safeguarding the cultural and institutional distinctiveness of tribal communities.

8. Promissory Estoppel: Meaning and Legal Principles

Context

The **Supreme Court** recently examined the scope of the **Doctrine of Promissory Estoppel** and ruled that it cannot be invoked to obtain benefits from a government policy by beneficiaries who fall outside the policy's intended coverage.

About Promissory Estoppel

1. **Promissory Estoppel** is a legal doctrine that prevents a person from going back on a promise when another party has relied upon it and suffered a loss or disadvantage.
2. The doctrine is based on the principles of **equity and fairness** and seeks to prevent injustice arising from the non-fulfilment of a promise.
3. The doctrine may apply even where no formal contract exists.
4. Its application generally requires:
 - a. **A clear and unambiguous promise;**
 - b. **Reasonable reliance** on the promise by the



promisee;

- c. **Loss or detriment** suffered as a result of such reliance.
5. In **Chhaganlal Keshavalal Mehta v/s Patel Narandas Haribhai (1981)**, the **Supreme Court** reaffirmed that a clear promise, reasonable reliance, and resulting detriment are essential for invoking the doctrine.

9. Urban Fire Safety in India: Challenges and Reforms

Context

Recent fire incidents in Delhi and Bihar have once again exposed serious shortcomings in urban fire safety, particularly in residential buildings, hospitals, and commercial establishments.

Urban Fire Safety in India

1. Residential buildings account for the majority of fire-related deaths in India, making them the most vulnerable category of structures.
2. Hospitals and commercial establishments also witness significant fire casualties.
3. Most fire-related deaths result from smoke inhalation and toxic gases rather than direct burns.

Governance Framework

1. **Constitutional and Institutional Responsibility**
 - a. Fire services fall under the **State List** of the Constitution.
 - b. Under **Article 243W** and the **Twelfth Schedule**, fire services are among the functions assigned to Urban Local Bodies (ULBs).
2. **National Building Code (NBC), 2016**
 - a. The **National Building Code (NBC), 2016**, issued by the **Bureau of Indian Standards (BIS)**, provides standards for fire prevention, evacuation systems, smoke management, and safety audits.
 - b. The Code serves as a model framework, and its implementation depends on adoption and enforcement by states and local authorities.
 - c. The primary challenge lies in weak enforcement and compliance rather than the absence of regulations.

Capacity Constraints

1. Rapid urbanisation and the growth of high-rise buildings have increased the demand for specialised firefighting capabilities.
2. Recognising these gaps, the **15th Finance**

Commission recommended dedicated financial support for strengthening fire services and emergency response systems.

Challenges and Way Forward

Challenges	Way Forward
Weak enforcement of fire safety norms and building regulations.	Strengthen inspections, periodic audits, and accountability mechanisms.
Unauthorised commercial use of residential buildings.	Ensure strict monitoring, licensing compliance, and deterrent penalties for violations.
Inadequate fire safety infrastructure and public preparedness.	Mandate fire alarms, extinguishers, evacuation plans, and regular safety drills.
Electrical faults and LPG-related hazards.	Promote periodic safety inspections, certification, and public awareness programmes.
Congested urban layouts hinder emergency response.	Integrate fire safety requirements into urban planning and building approval processes.
Limited manpower and specialised equipment in fire services.	Modernise fire departments through greater investment, training, and technology adoption.

Conclusion

Urban fire safety requires a shift from reactive response to preventive governance. Effective enforcement of safety standards, resilient urban planning, public awareness, and strengthened fire services are essential to reduce fire-related risks and build safer and more resilient cities.

10. Victim Protection Plan for Trafficking Survivors

Context

The Supreme Court recently introduced a comprehensive **Victim Protection Plan** for survivors of human trafficking and commercial sexual exploitation (CSE). Observing the absence of an effective framework for victim protection and rehabilitation, the Court issued detailed guidelines that will remain in force until Parliament enacts a dedicated law.

Genesis of the Judgment



The case arose from a petition seeking stronger protection and rehabilitation measures for trafficking survivors.

Key Concerns

1. Victims were often treated as offenders rather than rights-holders.
2. Rescue operations were not accompanied by effective rehabilitation measures.
3. Proposed institutional reforms and anti-trafficking legislation remained unimplemented.
4. Existing legal provisions lacked a comprehensive survivor-centric framework.

Recognising this legislative and institutional vacuum, the Court intervened to safeguard the rights and dignity of trafficking survivors.

Dignity and Rehabilitation as Constitutional Guarantees

The judgment places human dignity at the centre of anti-trafficking efforts and recognises rehabilitation as an essential constitutional guarantee.

Constitutional Basis

1. **Article 21:** Right to life and dignity.
2. **Article 23:** Prohibition of human trafficking and forced labour.

Key Observations

1. Human trafficking violates dignity, autonomy, and personal liberty.
2. Poverty, economic dependence, and social vulnerability often increase susceptibility to exploitation.
3. Survivors frequently experience stigma, exclusion, and economic insecurity.
4. Rehabilitation is indispensable for restoring dignity and enabling meaningful reintegration into society.

Significance

1. Shifts the focus from a purely punitive approach to a rights-based framework.
2. Recognises rehabilitation as an integral component of constitutional protection.
3. Promotes empowerment, social inclusion, and restoration of agency.

Supreme Court's Observations on the ITPA, 1956

The Court highlighted limitations in the **Immoral Traffic (Prevention) Act (ITPA), 1956**.

Key Concerns

1. The law does not clearly distinguish between trafficked persons and voluntary adult sex workers.
2. A uniform approach may undermine personal liberty and dignity.
3. Long-term institutionalisation cannot be imposed without considering individual circumstances.

Directions

1. Authorities must undertake case-specific assessments.
2. The consent and wishes of adult women should receive due consideration.
3. Institutional custody should not become the default response.

Key Features of the Victim Protection Plan

During Rescue

1. Ensure dignified treatment and protection of privacy.
2. Prohibit disclosure of victims' identities.
3. Provide special safeguards for children, transgender persons, persons with disabilities, and individuals with mental illness.

Post-Rescue Support

1. Victims must not be detained in police lock-ups or police stations.
2. Ensure immediate access to legal aid, healthcare, and psychological counselling.
3. Produce victims before the competent authority without delay.

Rehabilitation and Reintegration

1. Transform protective homes into rehabilitation-oriented institutions.
2. Prepare individual care plans covering healthcare, counselling, education, skill development, and livelihood support.
3. Facilitate access to welfare schemes and financial inclusion measures.
4. Establish safeguards against abuse within rehabilitation facilities.

Institutional Strengthening Measures

Key Directions

1. Anti-Trafficking Units should be headed by officers of DSP rank or above.
2. Empower such units to register and investigate trafficking offences.
3. Maintain databases relating to traffickers and victims.
4. Strengthen coordination among law enforcement agencies, social workers, and child welfare authorities.



Legislative Reforms Suggested by the Court

1. Amend provisions that may lead to the criminalisation of trafficking victims.
2. Reconsider mandatory detention-based approaches in protective homes.
3. Safeguard the rights of voluntary adult sex workers.
4. Enact a comprehensive standalone anti-trafficking law.

Challenges and Way Forward

Challenges	Way Forward
Effective implementation of the Victim Protection Plan across States	Establish monitoring mechanisms and periodic review of compliance
Inadequate capacity of rehabilitation homes and support services	Increase funding, infrastructure, and trained personnel for survivor care
Limited coordination among police, judiciary, welfare agencies, and civil society	Develop integrated multi-agency response mechanisms
Persistent socio-economic vulnerabilities that facilitate trafficking	Strengthen livelihood generation, education, and social protection programmes
Emerging forms of trafficking through digital platforms and organised networks	Enhance technological capabilities, intelligence-sharing, and cyber-surveillance mechanisms

Conclusion

The Supreme Court's Victim Protection Plan marks a significant shift from a rescue-centric approach to a rights-based framework grounded in dignity, autonomy, and rehabilitation. By recognising survivor protection as a constitutional obligation, the judgment strengthens India's anti-trafficking response. Its long-term impact, however, will depend on effective implementation, institutional accountability, and sustained efforts towards rehabilitation, social inclusion, and empowerment of survivors.

11. Foreign Contribution (Regulation) Act (FCRA), 2010 and Recent Amendments

Context

The Ministry of Home Affairs has amended the FCRA Rules, 2010 to strengthen transparency, accountability, and regulatory oversight of organisations receiving foreign contributions.

Foreign Contribution (Regulation) Act, 2010

Objectives

1. Regulates the acceptance and utilisation of foreign contributions.
2. Prevents foreign funding from adversely affecting India's sovereignty, integrity, security, public interest, electoral processes, and communal harmony.
3. Promotes transparency and accountability in the utilisation of foreign contributions.

Constitutional Linkage

1. **Article 19(1)(c)** guarantees the right to form associations.
2. **Article 19(4)** permits reasonable restrictions in the interests of sovereignty, integrity, and public order.

Key Amendments

1. **Purpose-Specific Registration and Geographical Scope**
 - a. Organisations seeking registration or prior permission must select activities from a prescribed schedule instead of broad functional categories.
 - b. FCRA registration certificates will specify both approved activities and geographical areas of operation.
 - c. Existing FCRA-registered entities are required to update these details through the revised Form FC-6F within the stipulated period.
2. **Enhanced Disclosure Requirements**
 - a. Organisations must now provide details relating to:
 - b. Official websites and social media accounts.
 - c. Activity reports and organisational publications.
 - d. Ultimate donors where contributions are routed through intermediary or donor-advised channels.
 - e. These provisions aim to improve transparency, traceability, and monitoring of foreign contributions.
3. **Religious Activities**
 - a. Activities such as maintenance of places of worship, preservation of religious heritage, and conduct of spiritual programmes continue to be permitted.
 - b. However, the amended rules explicitly prohibit proselytisation-related activities under these categories.



4. Expanded Definition of Key Functionaries

- The scope of key functionaries has been expanded to include:
- Trustees and partners.
- Members of governing bodies.
- Company directors.
- Karta or head of a Hindu Undivided Family (HUF).
- Any person exercising control or managerial authority over the organisation.
- This widens accountability and regulatory scrutiny within foreign-funded organisations.

5. Eligibility and Compliance Requirements

- Organisations with foreign nationals as key functionaries will generally be ineligible for FCRA registration or prior permission unless specifically exempted by the Central Government.
- For renewal-related assessments, organisations must have utilised at least **₹10 lakh** of foreign contribution during the preceding two financial years.
- In prior-permission cases, subsequent instalments will be released only after utilisation of at least **75%** of previously received funds and verification by the competent authorities.

6. Revised Penalty Framework

- Administrative expenditure exceeding the prescribed limit attracts monetary penalties.
- Speculative investment of foreign contributions is subject to penalties and recovery of gains earned.
- Diversion of foreign funds from approved purposes attracts stricter financial penalties.
- Violations under the revised framework carry a minimum penalty of **₹1 lakh**.

Significance of the Amendments

Potential Benefits

- Enhances transparency and accountability in foreign-funded activities.
- Strengthens monitoring and regulatory oversight.
- Improves traceability of funding sources and utilisation patterns.
- Reduces the risk of fund diversion and opaque funding channels.
- Promotes alignment between approved objectives and actual activities.
- Strengthens safeguards relating to national security

and public order.

Concerns

- Increases compliance and reporting obligations for NGOs.
- May raise administrative and operational costs.
- Could reduce flexibility in programme implementation.
- May constrain the operational space of organisations dependent on foreign funding.

Conclusion

The amendments mark a shift towards a more compliance-driven framework through activity-specific registration, enhanced disclosures, and stricter oversight mechanisms. While these measures may strengthen transparency and accountability, their long-term effectiveness will depend on balancing regulatory objectives, national security concerns, and the legitimate functioning of civil society organisations.

12. Draft Broadcasting Rules, 2026

Context

The Ministry of Information and Broadcasting (MIB) has released the **Draft Telecommunications (Television, Radio and Associated Services) Rules, 2026** for stakeholder consultation. The draft seeks to create a unified regulatory framework for broadcasting services under the **Telecommunications Act, 2023**.

Broadcasting Regulation in India

- Broadcasting refers to the transmission of audio and audiovisual content through platforms such as television, radio, Direct-to-Home (DTH), Internet Protocol Television (IPTV), and other digital broadcasting services.
- Given its role in shaping public opinion, education, culture, and information dissemination, the sector is regulated by the **Ministry of Information and Broadcasting (MIB)**.
- Historically, different broadcasting services were governed through separate policy guidelines and licensing frameworks.
- Most of these regulations were based on the **Indian Telegraph Act, 1885**, resulting in a fragmented regulatory structure.
- The enactment of the **Telecommunications Act, 2023** created the need for a modern and harmonised regulatory regime.

Need for a Unified Framework

The proposed framework seeks to address regulatory



fragmentation and establish uniform standards across broadcasting platforms.

1. Broadcasting services currently operate under multiple regulatory and licensing systems.
2. The existing arrangement creates overlapping compliance requirements and administrative complexity.
3. Differences in regulatory requirements across platforms create uncertainty and compliance challenges for service providers.
4. Multiple approval and licensing procedures increase the compliance burden on broadcasters.
5. A unified framework is expected to improve regulatory consistency, administrative efficiency, and ease of compliance.
6. It also seeks to align broadcasting regulation with technological advancements and the evolving media ecosystem.

Key Provisions of the Draft Rules

Unified Regulatory Structure: The draft proposes a common regulatory framework for television and radio broadcasting services.

Consolidation of Existing Guidelines

The proposed framework seeks to integrate the following policy regimes:

1. Satellite TV Uplinking and Downlinking Guidelines, 2022
2. DTH Broadcasting Guidelines, 2001
3. Headend-in-the-Sky (HITS) Guidelines, 2009
4. FM Radio Phase III Policy Guidelines, 2011
5. Community Radio Policy Guidelines, 2024
6. IPTV Guidelines, 2008

Coverage

The proposed rules would apply to:

1. Television channels
2. FM radio broadcasters
3. Community radio stations
4. DTH operators
5. IPTV providers
6. HITS platforms

Public Service Content Obligations

1. Television broadcasters would be required to telecast at least **30 minutes** of public-interest content daily between **6 AM and 11 PM**.

2. Private radio broadcasters would be required to broadcast at least **one hour** of such content every day.
3. The prescribed themes include:
 - a. Education and literacy
 - b. Agriculture and rural development
 - c. Health and family welfare
 - d. Women and child welfare
 - e. Science and technology
 - f. Environmental protection
 - g. National integration and cultural heritage
 - h. Welfare of weaker sections
4. The draft makes public-service content mandatory instead of optional.
5. Channels catering exclusively to foreign audiences may be exempted, subject to national security and sovereignty considerations.

Regulatory Reforms

1. Introduction of digital authorisation and approval mechanisms.
2. Simplification of licensing and permission procedures.
3. Relaxation of the requirement for executing the Grant of Permission Agreement (GOPA) in specified cases.
4. Streamlined dispute-resolution and adjudication mechanisms.
5. Greater regulatory certainty for entities operating across multiple platforms.
6. Reduction in procedural delays and compliance costs.

Challenges and Way Forward

Challenges	Way Forward
Mandatory public-interest programming may increase operational and compliance costs for private broadcasters.	Adopt a flexible implementation framework while ensuring public-interest objectives are achieved.
Concerns regarding possible impact on editorial independence.	Clearly define regulatory obligations and safeguard editorial autonomy.
Transition to a unified regulatory regime may create implementation challenges.	Ensure phased implementation supported by detailed operational guidelines.
Smaller broadcasters may face financial and capacity constraints in meeting new requirements.	Provide compliance support, capacity-building measures, and simplified procedures.



Uniform regulation may not adequately address platform-specific concerns.

Continue stakeholder consultations and undertake periodic review of the regulatory framework.

Conclusion

The Draft Broadcasting Rules, 2026 represent an important step towards modernising India's broadcasting governance. By creating a unified regulatory structure, strengthening public-interest content obligations, and simplifying compliance requirements, the proposed framework seeks to enhance regulatory efficiency and transparency. Its success, however, will depend on balancing regulatory oversight with editorial freedom while ensuring that broadcasting services continue to serve broader public interests.

13. Insolvency Proceedings and Cheque Bounce Cases: Emerging Legal Issues

Context

The Supreme Court has referred to a larger bench the issue of whether a person undergoing insolvency proceedings under the Insolvency and Bankruptcy Code (IBC), 2016 can claim protection from prosecution under Section 138 of the Negotiable Instruments Act, 1881. The referral seeks to resolve conflicting judicial interpretations on the applicability of the IBC moratorium to cheque dishonour cases. Insolvency and Bankruptcy Code (IBC), 2016

Insolvency and Bankruptcy Code (IBC), 2016

1. The IBC provides a time-bound mechanism for insolvency resolution and orderly distribution of a debtor's assets among creditors.
2. To facilitate this process, the Code imposes a moratorium that temporarily suspends specified proceedings against the debtor.

Moratorium under IBC

Section 96 provides an interim moratorium from the date of filing an insolvency application.

3. Section 101 provides a statutory moratorium after admission of the application.
4. The moratorium prevents creditors from pursuing individual recovery actions during the insolvency process

Section 138 of the Negotiable Instruments Act, 1881

1. Section 138 criminalises the dishonour of cheques issued towards a legally enforceable debt or liability.
2. The provision allows for imprisonment, fine,

compensation to the complainant, and settlement through compounding.

Nature of the Dispute

1. The IBC seeks to ensure equitable treatment of creditors during insolvency proceedings.
2. Section 138 proceedings contain both penal and compensatory elements.
3. The key question is whether cheque dishonour proceedings should be treated primarily as criminal actions or as mechanisms for debt recovery.

Judicial Interpretation

1. P. Mohanraj v. Shah Brothers Ispat Pvt. Ltd. (2021): The Supreme Court held that cheque dishonour proceedings have a substantial compensatory character and may therefore fall within the scope of the IBC moratorium.
2. Rakesh Bhanot v. Gurdas Agro Pvt. Ltd. (2025): The Court held that the moratorium cannot be used to halt proceedings under Section 138, as its purpose is to suspend debt recovery actions rather than penal consequences.

Court's Preliminary View

The Court indicated that different aspects of a cheque dishonour case may require separate treatment:

1. Penal Aspect: Prosecution, conviction, imprisonment, and court-imposed fines arise from the criminal nature of the offence and may remain outside the scope of the moratorium.
2. Compensatory Aspect: Compensation awarded to the complainant is linked to recovery of money. Allowing such recovery during insolvency proceedings may undermine equal treatment of creditors; therefore, the moratorium may apply to this component.

Significance

1. Clarifies the applicability and scope of the IBC moratorium in cheque dishonour proceedings.
2. Balances creditor interests with the objectives of insolvency resolution.
3. Strengthens certainty in commercial transactions and insolvency jurisprudence.
4. May influence the treatment of offences that combine penal and compensatory elements under Indian law.

Conclusion

The dispute highlights the intersection of insolvency law and financial liability. The larger bench's ruling is expected to clarify the relationship between insolvency proceedings and cheque dishonour cases, while balancing effective debt resolution with the enforcement of legal obligations.



14. Doctrine of Constructive Res Judicata

Context

The Supreme Court recently reaffirmed that the doctrine of constructive res judicata, **embodied in Explanation IV to Section 11 of the Code of Civil Procedure, 1908**, which governs civil proceedings. However, the underlying principle has also been recognised in certain criminal proceedings through judicial interpretation.

About Doctrine of Constructive Res Judicata

1. The doctrine of **res judicata**, derived from **English common law**, literally means “**a matter already adjudicated**” and is also known as **claim preclusion**.
2. It extends this principle by treating issues that **could and ought to have been raised** in an earlier proceeding as having been in issue in that proceeding.
3. Consequently, a party cannot institute a fresh proceeding by raising claims or defences that were available but were omitted in the earlier litigation.
4. The doctrine prevents **piecemeal litigation** by requiring parties to raise all material claims and defences in the initial proceeding.
5. It applies where:
 - a. The parties in both proceedings are the same (or litigate under the same title);
 - b. The subsequent proceeding relates to the same dispute;
 - c. The issue could and ought to have been raised in the earlier proceeding; and
 - d. The earlier proceeding was finally decided on merits by a competent court.
6. The doctrine promotes **judicial efficiency**, prevents **multiplicity of proceedings**, discourages **abuse of the judicial process**, and ensures the **finality of judicial decisions**.

15. Reproductive Autonomy of Women with Intellectual Disabilities

Context

The Karnataka High Court permitted a **total abdominal hysterectomy** for a 23-year-old woman with severe intellectual and developmental disabilities after a medical board concluded that she lacked the capacity to provide informed consent. Considering her recurring health complications and medical evidence, the Court approved the procedure under its **parens patriae** jurisdiction. The case highlights the challenge of balancing **reproductive**

autonomy, informed consent, medical necessity, and judicial oversight.

Informed Consent and Decision-Making Capacity

Informed consent is a fundamental principle of medical law requiring a person to voluntarily understand the nature, purpose, risks, and consequences of a medical procedure before agreeing to it.

Where a person with severe intellectual disability lacks the capacity to make an informed decision, irreversible medical procedures cannot be authorised solely by caregivers or doctors. In such situations, courts invoke the **doctrine of parens patriae**, under which the State acts as a guardian to safeguard the individual's health, dignity, and bodily integrity.

Legal Framework

Rights of Persons with Disabilities (RPwD) Act, 2016

Section 10 of the RPwD Act prohibits medical procedures resulting in infertility without the **free and informed consent** of the person with disability.

The provision protects persons with disabilities from **forced or non-consensual sterilisation** by making free and informed consent the general rule, with any departure subject to strict judicial scrutiny.

Supreme Court Guidelines on Hysterectomies

In **Dr. Narendra Gupta v. Union of India (2023)**, the Supreme Court held that unnecessary hysterectomies performed without medical necessity or informed consent violate the **right to health under Article 21**.

The Court directed States and Union Territories to:

1. Implement the Union Health Ministry's **2022 Guidelines to Prevent Unnecessary Hysterectomies**.
2. Establish hysterectomy monitoring committees at the national, state, and district levels.
3. Take stringent action, including blacklisting hospitals performing unjustified procedures.

Abortion and Intellectual Disability

The **Medical Termination of Pregnancy (MTP) Act, 1971** permits guardian consent for women with **mental illness**, but not for women with **intellectual disabilities**, whose own consent remains legally mandatory.

This creates a legal and ethical dilemma, requiring courts to balance statutory requirements with the constitutional commitment to protecting the rights and welfare of women with intellectual disabilities.

Important Judicial Decisions



1. **Suchita Srivastava v. Chandigarh Administration (2009):** The Supreme Court recognised reproductive choice as an integral part of **Article 21** and clarified that **intellectual disability is distinct from mental illness**.
2. **Z v. State of Bihar (2017):** The Supreme Court awarded compensation after an unlawful insistence on third-party consent delayed abortion beyond the statutory limit.
3. **Orissa High Court (2020):** Termination of a 24-week pregnancy was declined on medical grounds, while compensation and postnatal care were directed.
4. **Gujarat High Court (2024):** A 28-week abortion was permitted after medical experts found that continuation of pregnancy posed serious physical and psychological risks.

Balancing Reproductive Autonomy and the Best Interests Principle

Judicial decisions seek to balance two competing constitutional principles:

1. **Reproductive Autonomy:** Every woman has the right to make decisions concerning her reproductive health and bodily integrity. This right flows from **Article 21** and is reinforced by the **UN Convention on the Rights of Persons with Disabilities (UNCPRD)**, which upholds equality, dignity, and non-discrimination.
2. **Best Interests Principle:** Where a person lacks decision-making capacity, courts determine the course of action that best safeguards her health, dignity, and overall welfare. This principle is applied only in exceptional cases where informed consent cannot be obtained.

Conclusion

Indian jurisprudence increasingly affirms that disability cannot be a ground to deny reproductive rights. Courts endeavour to uphold individual autonomy while invoking the **best interests** principle only where decision-making capacity is absent. The evolving legal framework seeks to balance **constitutional rights, medical ethics, and judicial oversight**, ensuring that women with intellectual disabilities receive both legal protection and equal respect for their dignity and autonomy.

16. Online Real-Money Gaming in India: Supreme Court Rulings

Context

The Supreme Court recently delivered two landmark judgments concerning India's online real-money gaming industry. It upheld the constitutional validity of the 28%

GST on online gaming involving monetary stakes and affirmed the authority of States to regulate or prohibit such activities. The rulings have significant implications for taxation, regulation, and the future governance of the sector.

Genesis of the Dispute

The litigation arose from two interconnected issues:

1. The validity of State laws enacted by Tamil Nadu and Karnataka to regulate or prohibit online betting and wagering activities.
2. The validity of the 28% GST imposed on online gaming involving monetary stakes, including retrospective tax demands issued to gaming companies.

Supreme Court's Ruling on GST

The Court upheld the validity of the 28% GST levy on online gaming involving monetary stakes.

Key Observations

1. GST is applicable on the entire amount staked by players and not merely on the platform's commission.
2. Activities involving monetary stakes on uncertain outcomes fall within the scope of betting and wagering for taxation purposes.
3. Once wagering is involved, the distinction between games of skill and games of chance becomes irrelevant for GST liability.
4. The 2023 GST amendments were clarificatory in nature and did not create a new tax liability.

Significance

1. Provides legal certainty to the taxation framework governing online gaming.
2. Confirms Parliament's authority to tax real-money gaming activities.
3. Increases tax and compliance obligations for gaming operators.

Supreme Court's Ruling on State Regulation

The Court also upheld the constitutional validity of State laws regulating or prohibiting real-money gaming activities.

Key Observations

1. Betting and gambling are *res extra commercium* and therefore do not enjoy the same constitutional protection as legitimate commercial activities.
2. States possess legislative competence under Entry 34 of the State List to regulate or prohibit wagering activities.
3. The presence of monetary stakes can impart the



character of wagering even where skill is involved.

4. Restrictions may also be justified on grounds of public order and social welfare.

Significance

1. Strengthens the regulatory authority of States over online gaming.
2. Narrows the scope of protection available under the “game of skill” argument.
3. Provides constitutional backing for stricter State-level regulation.

Emerging Federalism Debate

The judgments have revived an important constitutional question regarding legislative competence over online gaming.

1. **Constitutional Basis**
 - a. **Entry 34, State List (List II):** Betting and gambling.
 - b. **Entry 52, Union List (List I):** Regulation of industries in the public interest.
2. **Core Issue**
 - a. The Supreme Court reaffirmed that betting and gambling fall within the legislative domain of States.
 - b. However, the Promotion and Regulation of Online Gaming Act, 2025 was enacted by Parliament by invoking powers under the Union List.
 - c. The judgments have highlighted the unresolved question of whether online gaming should primarily be treated as betting and gambling under State jurisdiction or as a regulated industry under Parliament’s competence.

Implications

1. The constitutional validity of the 2025 Central law may face judicial scrutiny.
2. The issue could trigger a significant Centre–State jurisdictional debate.
3. Future litigation is likely to determine the extent of Parliament’s authority in regulating online gaming.
4. The outcome will shape India’s long-term regulatory framework for the sector.

Implications for the Industry

1. Higher tax and compliance costs may affect the viability of real-money gaming platforms.
2. Increased regulatory oversight is likely to raise operational burdens.
3. Divergent State regulations may create a fragmented regulatory environment.
4. Regulatory uncertainty could affect investor confidence and market expansion.
5. The sector may witness business model adjustments in response to stricter taxation and regulation.

Conclusion

The Supreme Court’s rulings have reinforced the taxation and regulation of online real-money gaming while strengthening the role of States in governing wagering activities. At the same time, they have brought the Centre–State division of legislative powers into focus. Going forward, the challenge will be to develop a regulatory framework that balances economic innovation, consumer protection, and constitutional federalism





INTERNATIONAL RELATIONS

1. India–France Relations: A Comprehensive Strategic Partnership

Context

Prime Minister Narendra Modi's visit to France reflects the growing depth of bilateral ties. The visit includes a bilateral summit with President Emmanuel Macron and participation in the G7 Summit, following the elevation of relations to a **Special Global Strategic Partnership** in 2026.

Significance of the Current Visit

1. The visit places significant emphasis on **technology, innovation, startups, and emerging technologies**, signalling the expansion of cooperation beyond traditional sectors.
2. Both countries are strengthening collaboration between their innovation ecosystems, industries, and technology enterprises.
3. India's participation in major technology platforms in France highlights the increasing importance of digital technologies and artificial intelligence in bilateral engagement.
4. The G7 Summit provides India with an opportunity to engage on key geopolitical, economic, energy, and security issues.

Evolution of India–France Relations

Historical Evolution of the Partnership

1. India and France share a relationship rooted in mutual trust, strategic autonomy, and long-term convergence of interests.
2. In 1998, France became India's first strategic partner among Western countries, while India became France's first strategic partner in the non-Western world.
3. France has consistently maintained an independent approach towards India, including during periods of international pressure following the Pokhran-II nuclear tests.
4. The partnership has demonstrated continuity and stability across successive political leaderships.

Convergence on Global Issues

1. Both countries support a multipolar world order and effective multilateralism.

2. France's emphasis on strategic autonomy aligns closely with India's policy of strategic autonomy and multi-alignment.
3. The two countries cooperate on reforming global governance institutions and addressing contemporary geopolitical challenges.

Major Pillars of Cooperation

1. Defence Cooperation

- a. Defence remains the cornerstone of bilateral relations.
- b. Cooperation spans air, naval, missile, and aerospace sectors.
- c. Major defence projects have enhanced India's military capabilities while contributing to defence indigenisation.
- d. Increasing emphasis is being placed on co-development, co-production, and technology transfer.

2. Space Cooperation

- a. The partnership between **ISRO** and the French space agency **CNES** is one of India's longest-standing international space collaborations.
- b. Cooperation covers satellite development, earth observation, launch services, and human spaceflight missions.
- c. Both countries are also working together in climate monitoring and advanced space technologies.

3. Civil Nuclear Cooperation

- a. Civil nuclear energy has emerged as an important area of engagement.
- b. Cooperation in advanced nuclear technologies, including **Small Modular Reactors (SMRs)** and **Advanced Modular Reactors (AMRs)**, supports India's clean-energy transition and long-term energy security.

4. Technology and Innovation

- a. Technology has emerged as a key driver of the partnership.
- b. Collaboration extends to artificial intelligence, digital infrastructure, cybersecurity, startups, and innovation ecosystems.
- c. Growing cooperation in critical and emerging



technologies is shaping the future trajectory of bilateral relations.

Importance of France for India

1. France is one of India's closest strategic partners in Europe and a key pillar of India's engagement with the West.
2. The relationship is characterised by mutual respect, policy consistency, and strategic trust.
3. France has consistently supported India's greater role in global institutions and international forums.
4. France remains a strong supporter of India's aspiration for a permanent seat in a reformed United Nations Security Council.
5. Both countries are important partners in promoting a **free, open, inclusive, and rules-based Indo-Pacific**.
6. The partnership contributes to India's objectives of strategic autonomy, defence modernisation, technological advancement, and energy security.

Emerging Areas of Cooperation

1. Defence co-development and co-production.
2. Critical and emerging technologies, including Artificial Intelligence and quantum technologies.
3. Space exploration, climate monitoring, and advanced satellite applications.
4. Civil nuclear energy and next-generation reactor technologies.
5. Green hydrogen, renewable energy, and sustainable development.
6. Maritime security and Indo-Pacific cooperation.
7. Digital public infrastructure, cybersecurity, and innovation-led growth.

Conclusion

India–France relations have evolved into a resilient and multidimensional partnership anchored in strategic trust, shared interests, and mutual respect. As both countries deepen cooperation in defence, technology, energy, space, and the Indo-Pacific, the partnership is poised to play a significant role in shaping regional stability, global governance, and emerging technological ecosystems.

2. India–Seychelles Relations: Historical Linkages, Strategic Partnership and Maritime Cooperation

Context

Prime Minister Narendra Modi is on a three-day visit to Seychelles as the **Guest of Honour** for the country's **50th Independence Day** celebrations (29 June 2026). The visit reflects India's commitment to deepening its strategic

partnership with Seychelles.

Historical and People-to-People Ties

1. India and Seychelles share a long-standing relationship dating back to **1770**, when the first Indian settlers arrived on the islands.
2. **Persons of Indian Origin (PIOs)** constitute nearly **5%** of Seychelles' population, while over **9,000 Non-Resident Indians (NRIs)** are employed in sectors such as construction, trade and professional services.
3. The Indian community, mainly of **Gujarati and Tamil** origin, has made significant contributions to Seychelles' economy and society.

Economic and Commercial Relations

1. Indian migration to Seychelles expanded during the **20th century**, primarily from **Tamil Nadu, Puducherry and Gujarat**.
2. During British rule, Seychelles was administered for a period under the **Bombay Presidency**, facilitating maritime trade and the movement of people.
3. These historical linkages laid the foundation for enduring economic and commercial relations.

Diplomatic Relations

1. India established diplomatic relations with Seychelles in **1976**, the year the island nation attained independence.
2. Bilateral ties have steadily expanded through regular high-level engagements, defence cooperation and development partnerships.
3. During his 2026 visit, Prime Minister Modi reaffirmed Seychelles' importance under India's **MAHASAGAR (Mutual and Holistic Advancement for Security and Growth Across Regions)** vision for regional maritime cooperation.

Cultural Relations

1. The Indian community has played a central role in strengthening cultural ties between the two countries.
2. In **2022**, a statue of **Mahatma Gandhi** was unveiled at **Peace Park, Victoria**, symbolising the shared values of peace and freedom.
3. Distinguished members of the Seychellois Indian community have been honoured with the **Pravasi Bharatiya Samman Award** for their contributions to strengthening India–Seychelles relations.

Development Partnership

1. India is a key development partner, extending support through **grants, Lines of Credit and capacity-building programmes**.
2. Cooperation spans **infrastructure, healthcare,**



education, public transport and human resource development.

3. More than **1% of Seychelles' population** has received professional training in India.
4. During the 2026 visit, India announced a **US\$175 million Special Economic Package** to support Seychelles' development priorities.
5. India is also a preferred destination for **medical tourism** and healthcare cooperation.

Strategic Significance

1. Seychelles occupies a strategic location in the **Western Indian Ocean**, overlooking key **Sea Lines of Communication (SLOCs)** connecting Africa, the Middle East and Asia.
2. The partnership strengthens cooperation in **maritime security**, including efforts to combat **piracy, terrorism, illegal fishing and other transnational maritime threats**.
3. It advances India's **MAHASAGAR** vision, reinforces engagement with the **Global South**, and contributes to peace, stability and a rules-based maritime order in the Indian Ocean.

Importance for India

1. Strengthens India's maritime security and strategic presence in the Indian Ocean.
2. Advances the **MAHASAGAR** vision through regional maritime cooperation.
3. Promotes collaboration in the **Blue Economy**, disaster resilience and capacity building.
4. Supports efforts to combat piracy, terrorism and illegal fishing.
5. Deepens India's engagement with **Small Island Developing States (SIDS)** and the **Global South**.

Conclusion

India-Seychelles relations have evolved from historical ties into a comprehensive strategic partnership based on mutual trust, development cooperation and shared maritime interests. As the Indian Ocean gains greater geopolitical significance, sustained collaboration with Seychelles will remain vital for advancing regional security, sustainable development and India's maritime interests.

3. India-Slovakia Bilateral Relations: Elevation to a Comprehensive Partnership

Context

Recently, India and Slovakia elevated their ties to a **Comprehensive Partnership** during Prime Minister Narendra Modi's visit to **Bratislava**, the first by an Indian Prime Minister since Slovakia's independence in 1993.

India-Slovakia Relations: India and Slovakia share cordial ties based on democratic values and growing cooperation in economic and strategic sectors. Slovakia's position in **Central Europe** and its membership of the **EU** and **NATO** make it an important partner for India.

Historical Background

1. India established diplomatic relations with Slovakia in **1993** after the peaceful dissolution of Czechoslovakia.
2. The relationship draws upon India's longstanding association with former Czechoslovakia, one of the earliest countries to recognize independent India.
3. Bilateral ties have gradually expanded through political dialogue, economic engagement, cultural exchanges, and cooperation in international forums.

Key Pillars of Cooperation

1. **Political and Global Engagement**
 - a. Regular high-level interactions and institutional mechanisms have strengthened bilateral relations.
 - b. Both countries advocate **multilateralism**, respect for international law, and reform of global governance institutions.
 - c. Slovakia supports India's aspiration for **permanent membership of a reformed United Nations Security Council (UNSC)**.
 - d. Cooperation extends to areas such as **counter-terrorism, climate action, sustainable development, and UN reforms**.
 - e. Slovakia has consistently backed closer cooperation between **India and the European Union**.
2. **Trade and Economic Relations**
 - a. Bilateral trade has expanded steadily, exceeding **€1.28 billion in 2024**.
 - b. Key areas of cooperation include **automobiles, engineering goods, electronics, pharmaceuticals, machinery, and advanced manufacturing**.
 - c. The partnership is supported by complementary strengths in **innovation, manufacturing capabilities, and industrial value chains**.
3. **People-to-People Contacts**
 - a. The Indian community in Slovakia is estimated at **5,000–7,000 people**.
 - b. Members of the diaspora are primarily engaged in **IT, engineering, academia, and entrepreneurship**, contributing to stronger societal and economic linkages.



Major Outcomes of Prime Minister Modi's Visit

1. **Comprehensive Partnership:** The bilateral relationship was elevated to a **Comprehensive Partnership**, creating a broader framework for cooperation across diverse sectors.
2. **Defence Cooperation**
 - a. A **Letter of Intent** was signed to enhance defence collaboration.
 - b. Both sides agreed to promote **joint development, co-production, and defence industrial cooperation**.
3. **Digital and Emerging Technologies**
 - a. An **MoU on Digital Technology** was signed to strengthen cooperation in digital transformation.
 - b. An **India Chair on Artificial Intelligence** will be established at a Slovak university.
 - c. The two countries agreed to expand engagement in **space activities** and **civil nuclear energy**.
4. **Trade, Investment and Industrial Collaboration**
 - a. Priority sectors identified for future collaboration include **automobiles, railways, electronics, advanced manufacturing, and green technologies**.
 - b. Slovakia supported the early implementation of the **India–EU Free Trade Agreement (FTA)** to facilitate greater economic integration.
5. **Labour Mobility**
 - a. An **MoU on Labour Migration** was signed to facilitate the movement of skilled professionals.
 - b. Both countries agreed to work towards a **Social Security Agreement** to safeguard workers' interests.
6. **Counter-Terrorism**
 - a. India and Slovakia reiterated their commitment to combating terrorism in all its forms.
 - b. They agreed to establish a **Joint Working Group on Terrorism**.
 - c. Both sides reaffirmed support for the **Comprehensive Convention on International Terrorism (CCIT)** at the United Nations.

Significance

1. Enhances India's engagement with **Central Europe** and strengthens its outreach to the wider European region.
2. Opens new avenues for collaboration in **defence**

production, artificial intelligence, digital technologies, space, and clean energy.

3. Facilitates greater **trade, investment, industrial partnerships, and skilled workforce mobility**.
4. Promotes cooperation on **security challenges, institutional reforms, and international governance issues**.
5. Demonstrates the growing alignment of Indian and European interests in an increasingly interconnected global environment.

Conclusion

The elevation of India–Slovakia ties to a **Comprehensive Partnership** marks an important milestone in bilateral relations. By broadening cooperation across strategic, economic, technological, and people-centric domains, the partnership is expected to deepen India's engagement with Central Europe while contributing to shared growth, security, and long-term collaboration.

4. India–Turkey Relations

Context

India and Turkey are witnessing a gradual revival of bilateral engagement after a prolonged period of diplomatic strain arising from Ankara's position on **Jammu & Kashmir** and its defence cooperation with **Pakistan**. Recent diplomatic interactions indicate a pragmatic effort by both countries to rebuild ties despite continuing strategic differences.

Evolution of Bilateral Relations

Bilateral relations strengthened during the early 2000s through expanding political engagement, trade, cultural exchanges, and business cooperation. However, ties deteriorated after Turkey repeatedly criticised India's constitutional changes in **Jammu & Kashmir** following the abrogation of **Article 370** in 2019 and consistently supported Pakistan's position on the issue.

Factors Behind Diplomatic Strains

1. **Kashmir Issue:** Turkey's continued support for Pakistan's position on Kashmir in international forums became the principal source of bilateral tensions. Differences widened further after Turkey criticised **Operation Sindoor** following the **Pahalgam terrorist attack**.
2. **Defence Cooperation with Pakistan:** India expressed concerns over Turkey's expanding defence partnership with Pakistan, particularly reports regarding the use of Turkish-origin defence equipment by Pakistan, which raised security concerns in New Delhi.



Impact on Bilateral Engagement

The deterioration in relations affected both diplomatic and economic engagement.

1. Diplomatic Measures

- Reduction in high-level diplomatic interactions.
- Expansion of India's strategic engagement with **Greece and Cyprus**.

2. Economic Repercussions

- Suspension of selected commercial, academic, and aviation-related collaborations.
- Decline in tourism and moderation in bilateral trade.
- Revocation of the security clearance of a Turkish airport services company on national security grounds.

Recent Confidence-Building Measures

Recent engagements indicate a gradual restoration of bilateral dialogue through:

- Resumption of **Foreign Office Consultations** after a prolonged gap.
- Discussions on trade, investment, technology, energy, tourism, education, and counter-terrorism cooperation.
- Cooperation in law enforcement, including Turkey's assistance in extraditing a fugitive wanted by Indian authorities.
- Confidence-building measures aimed at restoring mutual trust and sustaining diplomatic engagement.

Drivers of Turkey's Policy Recalibration

Turkey's renewed engagement with India is driven by:

- The need to preserve economic ties with one of the world's fastest-growing major economies.
- Expanding opportunities in trade, investment, infrastructure, and tourism.
- Efforts to diversify strategic partnerships while strengthening engagement with emerging Asian economies.

India's Strategic Priorities

Maintaining constructive engagement with Turkey serves India's strategic and economic interests by enabling:

- Greater diplomatic outreach in the Islamic world.
- Improved access to European and Central Asian markets.
- Support for regional connectivity initiatives and diversified trade routes.

- Enhanced cooperation in trade, technology, energy, and multilateral forums.

Way Forward

Strengthening bilateral relations requires:

- Sustained diplomatic dialogue to manage differences.
- Expanding economic and investment partnerships.
- Enhancing cooperation in counter-terrorism and security.
- Promoting collaboration in connectivity initiatives and multilateral forums.
- Respecting each other's core strategic concerns while expanding areas of mutual interest.

Conclusion

India-Turkey relations are gradually moving towards pragmatic engagement. While differences over sensitive political issues continue, sustained dialogue, stronger economic cooperation, and mutual respect for each other's core interests can help build a stable, balanced, and mutually beneficial partnership.

5. India-Nepal Boundary Issue

Context

Statements made by Nepal's Prime Minister in Parliament have once again brought the long-pending border disagreements between India and Nepal into focus.

About India-Nepal Boundary Issue

- India and Nepal have an **open border** of around **1850 km** across Uttar Pradesh, Uttarakhand, Bihar, West Bengal and Sikkim. Although most of the boundary is settled, some areas still remain disputed.
- This dispute originates from the **Treaty of Sugauli (1816)** signed after the Anglo-Nepalese War which recognized the **Kali (Mahakali) River** as Nepal's western boundary. Differences over the river's exact source later gave rise to competing territorial claims.
- The principal disputed areas are **Kalapani, Lipulekh Pass, and Limpiyadhura**.
 - Kalapani** - Strategically important as located at India-Nepal-China trijunction.
 - Lipulekh Pass** - Connect India with Tibet. Important route for Kailash-Mansarovar Yatra.
 - Limpiyadhura** - Nepal claims that Kali river originates from here, placing Kalapani and Lipulekh within Nepal's territory, to which India disagrees.
- Tensions increased in 2020 when Nepal altered its official map to include the disputed regions within its



claimed boundaries. India did not accept this revision and reiterated its position that such issues should be settled through established bilateral mechanisms.

- Both countries have consistently preferred a **peaceful resolution** through **bilateral dialogue, joint boundary mechanisms, survey and mapping exercises, and examination of historical and cartographic evidence** by experts.
- In his recent remarks, Prime Minister **Balendra Shah** stated that the dispute may not be entirely one-sided and suggested that there could be areas where Nepal occupies land claimed by India. He also revealed that Nepal had formally raised disputed territories with India, received a positive response, and proposed future discussions involving **historians, surveyors, and boundary experts** to establish factual clarity.
- Shah's reference to consultations with **China and the United Kingdom**, citing their historical relevance to the issue, generated attention because India traditionally favours **direct bilateral settlement** without third-party involvement.
- His remarks also sparked debate within Nepal, where several experts questioned the claim of Nepal occupying Indian territory, while emphasizing that most boundary issues have already been resolved and that both countries continue to support a **negotiated and diplomatic settlement**.

Conclusion

Despite periodic disagreements over specific boundary segments, India and Nepal have consistently emphasized dialogue and mutual understanding. A fact-based and diplomatic approach remains essential for preserving the close historical, cultural, and strategic ties between the two neighbours.

6. India–Oman Bilateral Relations and the India–Oman CEPA

Context

The India–Oman Comprehensive Economic Partnership Agreement (CEPA), signed in December 2025, has come into force amid disruptions in the Strait of Hormuz. The agreement is expected to strengthen India's trade resilience, energy security, and connectivity with the Gulf region during a period of geopolitical uncertainty.

India–Oman Relations

India and Oman share longstanding maritime and commercial ties that have evolved into a comprehensive strategic partnership spanning trade, energy, defence, connectivity, and people-to-people relations.

Political and Strategic Cooperation

- Oman is India's oldest strategic partner in the Gulf region.
- The two countries maintain regular high-level political engagement and strategic dialogue.
- Maritime security, defence cooperation, and anti-piracy operations are key areas of collaboration.
- India's access to Duqm Port enhances its strategic presence in the western Indian Ocean.
- Both countries support regional stability and freedom of navigation.

Trade and Economic Relations

- Oman is an important economic partner of India in the Gulf.
- Bilateral trade reached about USD 11.18 billion in FY 2025–26.
- India imports crude oil, LNG, fertilisers, methanol, and ammonia from Oman.
- Major Indian exports include petroleum products, machinery, engineering goods, iron and steel products, rice, and ceramics.
- Economic cooperation is expanding into logistics, infrastructure, manufacturing, and investment.

Indian Diaspora

- Nearly 700,000 Indians reside in Oman, forming the country's largest expatriate community.
- The diaspora plays an important role in strengthening bilateral ties.

India–Oman CEPA

The CEPA aims to deepen economic integration, expand market access, promote investments, and strengthen bilateral trade.

Key Features

- Duty-free access on nearly 98% of Oman's tariff lines for Indian exports.
- Better market access for engineering goods, machinery, textiles, chemicals, and petroleum products.
- Promotion of investments and industrial cooperation.
- Greater trade facilitation and supply-chain integration.
- Diversification of economic engagement beyond the energy sector.

Significance of CEPA

- Trade Resilience**
 - The Strait of Hormuz is a critical global trade and energy route.



- b. Regional tensions have disrupted shipping and increased freight costs.
- c. CEPA strengthens India's trade links with the Gulf and enhances supply-chain resilience.

2. Connectivity

- a. Oman has major ports such as Duqm and Salalah located outside the Strait of Hormuz.
- b. These ports provide India with a reliable trade and logistics gateway during regional disruptions.
- c. Duqm Port supports India's maritime outreach in the Indian Ocean and improves access to West Asia and Africa.

3. Energy Security

- a. The agreement strengthens access to crude oil and LNG supplies.
- b. It ensures reliable imports of fertilisers, methanol, and ammonia.
- c. Diversified sourcing enhances India's energy security amid geopolitical uncertainties.

4. Export Opportunities

- a. The agreement is expected to improve the competitiveness of Indian exports, particularly in:
- b. Engineering goods and machinery
- c. Petroleum products
- d. Iron and steel products
- e. Agricultural products
- f. Electronics and electrical equipment
- g. Chemicals and consumer goods

Future Prospects

1. Greater utilisation of Duqm Port for trade and connectivity.
2. Expansion of cooperation in renewable energy, green hydrogen, and petrochemicals.
3. Increased bilateral investments and stronger supply-chain integration.
4. Enhanced maritime security cooperation in the Indian Ocean region.

Conclusion

The India–Oman CEPA marks an important step in deepening bilateral relations. By strengthening trade, connectivity, and energy cooperation, it complements the broader strategic partnership between the two countries and reinforces India's engagement with the Gulf region and the Indian Ocean.

7. USA–Iran Peace Framework Agreement

Context

The United States of America and Iran have announced a framework peace agreement aimed at ending months of conflict that disrupted regional stability, affected global energy supplies, and heightened geopolitical tensions across West Asia. The proposed Memorandum of Understanding (MoU) is expected to be formalised in Switzerland and subsequently endorsed through a United Nations Security Council (UNSC) resolution.

Genesis of the Peace Framework

The crisis stemmed from escalating tensions between the United States, Israel, and Iran over regional security concerns and Iran's nuclear programme. Military confrontations, economic pressures, and disruptions to maritime trade routes contributed to a prolonged period of instability, with significant implications for global energy markets.

Key Provisions of the Agreement

1. Security and Military Measures

- a. A permanent ceasefire has been proposed across all theatres of conflict.
- b. The United States will progressively lift the naval blockade imposed on Iran.
- c. American military deployments in areas surrounding Iran are expected to be scaled down.
- d. Both sides have agreed to refrain from actions that could undermine the peace process during the implementation period.

1. Strait of Hormuz

- a. Iran has agreed to restore unhindered commercial navigation through the Strait of Hormuz.
- b. The reopening of this critical maritime corridor is expected to support global energy security and international trade.
- c. Implementation arrangements will be managed under Iranian oversight.

2. Economic Measures

- a. A portion of Iran's frozen overseas assets will be released.
- b. Selected energy-related sanctions will be temporarily relaxed.
- c. Discussions have been initiated on an international economic recovery and reconstruction package for Iran.
- d. Economic concessions will be linked to phased



implementation of the agreement.

3. Nuclear Commitments

- Iran has reiterated its commitment not to pursue nuclear weapons.
- Uranium enrichment activities will remain frozen during the interim period.
- Negotiations on a comprehensive nuclear settlement will be undertaken separately in a subsequent phase.

Factors Facilitating the Agreement

- Rising regional instability increased concerns over a wider conflict.
- Disruptions to energy supplies created economic pressures on multiple stakeholders.
- The growing costs of prolonged confrontation encouraged diplomatic engagement.
- Mediation efforts by **Pakistan, Qatar, Saudi Arabia, and Turkey** helped create conditions for dialogue and consensus-building.

Unresolved Nuclear Issue

The future of Iran's nuclear programme remains the most sensitive and unresolved aspect of the peace process.

Despite military operations and economic sanctions, neither side achieved a decisive breakthrough. Consequently, both countries opted to prioritise conflict de-escalation and confidence-building measures while deferring negotiations on a long-term nuclear arrangement.

Implementation Phase

The agreement envisages a **60-day implementation and verification period** aimed at building mutual confidence and ensuring compliance.

Key areas of assessment include:

- Observance of ceasefire commitments.
- Progress in sanctions relief and asset releases.
- Reduction in regional military tensions.
- Prevention of actions that could disrupt the negotiation process.

The success of this phase will significantly influence prospects for a comprehensive settlement.

Challenges Ahead

- Deep-seated mistrust between the United States and Iran may hinder implementation.
- The unresolved nuclear issue could complicate future negotiations.
- Actions by regional actors may affect the stability of the agreement.
- Delays in sanctions relief or military de-escalation

could weaken confidence-building efforts.

- Sustaining diplomatic momentum over an extended period remains a key challenge.

Significance

Regional and Global Impact

- Reduces the possibility of a broader conflict in West Asia.
- Contributes to stability in a strategically important geopolitical region.
- Reduces uncertainty in global energy markets and maritime trade routes.
- Demonstrates the continued relevance of diplomacy and mediation in resolving complex international disputes.
- May create conditions for broader regional dialogue and confidence-building in West Asia.

Implications for India

- Enhances India's energy security by reducing risks to crude oil imports from the Persian Gulf.
- Improves the safety of maritime trade and shipping routes crucial for India's commerce.
- Supports India's strategic interests linked to **Chabahar Port** and regional connectivity initiatives.
- Promotes stability in a region that is vital to India's economic, energy, and geopolitical interests.

Conclusion

The US–Iran Peace Framework Agreement represents an important step towards reducing tensions in West Asia and restoring stability to global energy markets. While significant challenges remain, particularly regarding the nuclear issue, the agreement provides a foundation for sustained diplomatic engagement, economic recovery, and long-term regional stability. Its ultimate success will depend on effective implementation, continued dialogue, and the willingness of all stakeholders to uphold their commitments.

8. Uranium Downblending and Nuclear Non-Proliferation

Context

The recently signed **US–Iran Memorandum of Understanding (MoU)** provides for the downblending of Iran's highly enriched uranium stockpile under **International Atomic Energy Agency (IAEA)** supervision as part of efforts to prevent nuclear weapon development and strengthen confidence in the peaceful nature of Iran's nuclear programme.



Uranium Enrichment

1. **Natural uranium primarily contains:**
 - a. **Uranium-238 (U-238):** ~99.3%; non-fissile.
 - b. **Uranium-235 (U-235):** ~0.7%; fissile and capable of sustaining a nuclear chain reaction.
2. Uranium enrichment involves increasing the concentration of **U-235** above its natural level.
3. **Major enrichment levels include:**
 - a. **3–5%:** Fuel for commercial nuclear reactors.
 - b. **~20%:** Research reactors.
 - c. **90%+:** Weapons-grade uranium.
4. Iran enriched uranium up to **60% purity**, far above civilian reactor requirements and closer to weapons-grade levels.

Uranium Downblending

1. Uranium downblending refers to reducing the concentration of **U-235** in highly enriched uranium by mixing it with natural, depleted, or low-enriched uranium.
2. It is the reverse of enrichment and converts proliferation-sensitive material into forms suitable for peaceful civilian use.
3. The process seeks to increase **breakout time**.
Breakout Time: The minimum time required for a country to produce sufficient weapons-grade fissile material for a nuclear weapon.
4. Under the **2015 Joint Comprehensive Plan of Action (JCPOA)**, Iran was permitted to enrich uranium only up to **3.67%**, a level suitable for civilian reactors but inadequate for weapon production.

Mechanism of Uranium Downblending

1. Highly enriched uranium, generally stored as **uranium hexafluoride (UF₆)**, is converted into gaseous form.
2. It is blended with natural, depleted, or low-enriched uranium under controlled conditions to achieve the desired enrichment level.
3. Continuous monitoring systems verify enrichment levels throughout the process.
4. The blended material is subsequently converted into **uranium dioxide (UO₂)**, a commonly used reactor-fuel form.
5. Conversion into **UO₂** creates an additional technical barrier, as reconversion to **UF₆** is required before any future enrichment can occur.

Role of the IAEA

1. The **International Atomic Energy Agency (IAEA)** is the principal international body responsible for promoting the peaceful use of nuclear energy and

preventing its military diversion.

2. It supervises the downblending process through inspections, surveillance systems, sampling, and laboratory analysis.
3. The Agency verifies enrichment levels, applies safeguards, and ensures compliance with international non-proliferation obligations.
4. Independent verification is essential for maintaining transparency and international confidence.

Significance

1. Reduces the immediate risk of weaponisation by lowering enrichment levels and extending breakout time.
2. Strengthens global nuclear non-proliferation and arms-control efforts.
3. Enhances transparency and international confidence through independent verification.
4. Facilitates the peaceful use of nuclear energy.
5. Contributes to regional and global strategic stability.

Limitations

1. Iran retains the technical expertise, centrifuges, and infrastructure required for future re-enrichment.
2. Monitoring restrictions have created gaps in international oversight of its nuclear programme.
3. Since the downblended uranium remains within Iran rather than being transferred to a third country, concerns regarding future re-enrichment persist.
4. Technical safeguards alone cannot guarantee compliance without sustained political commitment.
5. Long-term effectiveness depends on continuous verification, diplomatic engagement, and mutual trust among stakeholders.

Conclusion

Uranium downblending is a critical non-proliferation measure that reduces immediate proliferation risks by lowering enrichment levels and extending breakout time. However, its long-term success depends on robust IAEA verification, sustained diplomatic engagement, and continued adherence to international nuclear commitments.

9. UNHRC Gaza Report: Allegations of Genocide and Its Legal Implications

Context

A **United Nations Human Rights Council (UNHRC)** Commission of Inquiry has released a report alleging that Israel deliberately targeted Palestinian children in Gaza and that these acts may indicate **genocidal intent** under international law. The report may influence ongoing



proceedings before international judicial bodies.

About the Commission

1. The report was prepared by the **UN Independent International Commission of Inquiry on the Occupied Palestinian Territory (including East Jerusalem) and Israel**.
2. Established by the **UNHRC in 2021**, the Commission investigates alleged violations of international human rights and humanitarian law and submits periodic reports.
3. It is currently chaired by **Justice S. Muralidhar (India)**, with **Florence Mumba (Zambia)** and **Chris Sidoti (Australia)** as members.
4. Earlier investigations by the Commission had also raised concerns regarding possible genocidal intent.

Key Findings

1. The Commission concluded that Palestinian children were **deliberately targeted**, rather than being incidental victims of the conflict.
2. It cited evidence of **targeted killings**, including injuries consistent with sniper and drone attacks.
3. According to the report, violence continued despite the **October 2025 ceasefire**, particularly near the Israeli-controlled **"Yellow Line"** security buffer.
4. The report also documented allegations of **torture, sexual violence and ill-treatment** of children during detention.
5. It alleged attacks on **schools, orphanages, paediatric hospitals and other civilian infrastructure** essential for children's survival and welfare.

Genocide under International Law

1. The **1948 Convention on the Prevention and Punishment of the Crime of Genocide (Genocide Convention)** defines genocide as acts committed with the **intent to destroy**, wholly or partly, a national, ethnic, racial or religious group.
2. The same definition is incorporated in **Article 6 of the Rome Statute**, which governs the jurisdiction of the **International Criminal Court (ICC)**.
3. Acts constituting genocide include:
 - a. Killing members of the group.
 - b. Causing serious bodily or mental harm.
 - c. Deliberately inflicting conditions of life calculated to bring about physical destruction.
 - d. Imposing measures intended to prevent births within the group.
 - e. Forcibly transferring children to another group.
4. Establishing **specific intent (dolus specialis)** is the

essential legal requirement for proving genocide.

Legal Significance

1. The Commission has **no judicial or enforcement powers**, but its findings may serve as **corroborative evidence** in proceedings before international courts.
2. Findings of UN commissions of inquiry have previously been relied upon as evidence in cases before the **International Court of Justice (ICJ)** and the **International Criminal Court (ICC)**.

Ongoing International Proceedings

1. **International Court of Justice (ICJ):** In **South Africa's case against Israel**, the ICJ has recognised that Palestinians in Gaza possess **plausible rights under the Genocide Convention** and has ordered provisional measures pending adjudication.
2. **International Criminal Court (ICC):** The ICC is examining allegations against senior Israeli leaders for violations of international criminal law. Establishing the **chain of command** and individual criminal responsibility will be central to the proceedings.

Challenges in Establishing Genocide

1. Proving **genocidal intent** requires a very high evidentiary threshold under international law.
2. **War crimes, crimes against humanity or ethnic cleansing** do not by themselves constitute genocide without proof of the specific intent to destroy a protected group.
3. Investigations are further constrained by limited access to evidence, geopolitical pressures and the absence of effective international enforcement mechanisms.

Importance of the Report

1. Strengthens the evidentiary basis for international legal proceedings.
2. Highlights the role of UN fact-finding mechanisms in documenting alleged violations of international humanitarian and human rights law.
3. Reinforces the importance of protecting civilians, especially children, during armed conflicts.
4. Reflects the opportunities and limitations of international accountability mechanisms in addressing grave violations of international law.

Conclusion

The UNHRC report adds to the evidentiary record on alleged violations in Gaza and may influence ongoing proceedings before international judicial bodies. However, establishing genocidal intent remains the central legal challenge, and meaningful accountability will ultimately depend on judicial findings, international cooperation and



effective enforcement of international law.

10. New Development Bank (NDB): Expanding BRICS-Led Development Finance

Context

Uzbekistan has become the 10th member of the New Development Bank (NDB), marking the first expansion of the BRICS-led institution into Central Asia and broadening its reach among emerging and developing economies.

About the New Development Bank (NDB)

1. The New Development Bank (NDB) is a multilateral development institution established by the **BRICS countries—Brazil, Russia, India, China, and South Africa**.
2. It was conceived at the **6th BRICS Summit (Fortaleza, Brazil, 2014)** and became operational in **2015**.
3. Headquartered in **Shanghai, China**, the bank finances **infrastructure and sustainable development projects** in BRICS nations and other **Emerging Market and Developing Economies (EMDEs)**.
4. The NDB has an **authorised capital of USD 100 billion**, with an initial subscribed capital of **USD 50 billion**, contributed equally by the founding members.
5. Its governance framework is based on **equal representation**, with each member having **one vote** and **no veto power**.
6. The combined voting share of the founding BRICS members is maintained above **55%** to ensure institutional balance and continuity.

Membership

1. Membership is open to all **United Nations member states** under the bank's Articles of Agreement.
2. The NDB currently has **ten members**, comprising the five founding BRICS countries and **Bangladesh, the United Arab Emirates, Egypt, Algeria, and Uzbekistan**.
3. **Uruguay, Colombia, and Ethiopia** have been approved for membership and will join upon completion of the accession process.

Significance of Uzbekistan's Entry

1. Uzbekistan is the **first Central Asian country** to join the NDB, extending the bank's presence into a strategically important region.
2. Its inclusion strengthens access to development

finance for **emerging and landlocked economies**.

3. The expansion strengthens the representation of the **Global South** in global development financing and financial governance.
4. It also supports efforts to promote **local currency financing** and diversify funding sources beyond excessive reliance on the **US dollar**.

Conclusion

Uzbekistan's accession reflects the NDB's growing role as a development financing institution for emerging economies. It also highlights the expanding influence of the **Global South** in shaping a more inclusive and diversified global financial architecture.

11. AUKUS and Strategic Security Cooperation in the Indo-Pacific

Context

The AUKUS partners recently announced plans to develop advanced underwater drone systems and deepen maritime cooperation, highlighting the growing focus on defence technology and security collaboration in the Indo-Pacific.

About AUKUS

1. AUKUS is a trilateral security partnership between **Australia, the United Kingdom, and the United States**, established in **2021**.
2. It aims to strengthen defence capabilities, promote technological cooperation, and enhance security and strategic balance in the **Indo-Pacific region**.

Key Pillars

1. **Pillar I**
 - a. Supports Australia in acquiring **conventionally armed, nuclear-powered submarines**.
 - b. Does **not involve the transfer of nuclear weapons**.
2. **Pillar II**
 - a. Focuses on cooperation in advanced defence and emerging technologies.
 - b. Covers areas such as **artificial intelligence, quantum technologies, cyber capabilities, information sharing, undersea systems, hypersonic and counter-hypersonic technologies, innovation, and electronic warfare**.

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SECURITY

1. Netra AEW&C System: Strengthening India's Airborne Surveillance and Air Defence

Context

The Defence Research and Development Organisation (DRDO) has completed the development of the indigenous Netra Airborne Early Warning and Control (AEW&C) system by issuing its Final Operational Clearance (FOC) to the Indian Air Force (IAF).

About Netra Airborne Early Warning and Control (AEW&C) System

1. The **Netra AEW&C System** is an indigenously developed airborne surveillance and command platform built on the **Brazilian Embraer EMB-145 aircraft** by the **Centre for Airborne Systems (CABS)** under **DRDO**. Popularly known as the Indian Air Force's "**Eye in the Sky**," it provides real-time surveillance, early warning and battlefield management. India is the **fifth country** to develop an indigenous AEW&C capability.
2. It can detect and track **aircraft, drones, missiles and ships** over long distances, identify friendly and hostile platforms through the **Identification Friend or Foe (IFF)** system, and guide fighter aircraft during operations.
3. It provides a **detection range of about 250–500+ km** with **300°–360° radar coverage**, enabling continuous surveillance over a wide area.
4. It is equipped with an **Active Electronically Scanned Array (AESA) radar**, mission computer, secure communication network, **Electronic Support Measures (ESM)** and **communication support measures**. Operating at high altitude, it overcomes the limitations of ground-based radars and shares real-time operational data with fighter aircraft, ground stations and other military platforms, enhancing **network-centric warfare** and coordinated air operations.

Significance

1. Strengthens India's **airborne surveillance** and **early warning** capability.
2. Enhances the **Indian Air Force's** air defence,

situational awareness and battle management.

3. Improves coordination among air, ground and other military assets through **real-time information sharing**.
4. Reinforces **Aatmanirbhar Bharat** by promoting indigenous defence technology and reducing dependence on foreign systems.

2. AGM-114 Hellfire Missile: Features and Operational Capabilities

Context

The **AGM-114 Hellfire missile** gained attention following its use by the United States during a maritime interdiction operation linked to tensions with Iran, highlighting its significance as a precision-guided weapon in modern military operations.

About AGM-114 Hellfire missile

1. The **AGM-114 Hellfire** is a **short-range, subsonic, precision-guided air-to-ground missile** developed in the **United States** and manufactured by **Lockheed Martin**.
2. The AGM-114 Hellfire was introduced in 1984 as an anti-tank missile and can be used to attack tanks, aircraft, bunkers, radar systems, and small ships.
3. The missile can be launched from a variety of platforms, including **helicopters, drones, fighter aircraft, and ground-based launchers**.
4. The missile family includes variants such as the **basic Hellfire series, Hellfire II, Anti-Ship Missile (AShM), and Longbow Hellfire**.
5. It has an operational range of **7–11 km**, carries a payload of **8–11 kg**, and can attain speeds of up to **Mach 1.3**.
6. It is powered by a **single-stage solid-fuel rocket motor** and uses **laser, radar, and imaging infrared (IIR) guidance systems** for accurately tracking and striking targets.
7. Its modular warheads include **high-explosive anti-tank (HEAT), fragmentation, and thermobaric payloads**, enabling it to engage a diverse range of military targets.



3. Project Glasswing and India's Cybersecurity Preparedness

Context

USA-based AI company [Anthropic](#) has expanded access to **Project Glasswing**, its restricted cybersecurity programme, to selected Indian organisations responsible for protecting critical digital infrastructure. The development highlights the growing role of advanced artificial intelligence in cybersecurity, national security, and critical infrastructure protection.

Project Glasswing and Claude Mythos

Project Glasswing is a controlled-access programme through which Anthropic provides selected organisations access to **Claude Mythos**, an advanced AI model designed for cybersecurity applications.

Key Features

1. Identifies critical software vulnerabilities at scale and speed.
2. Enables proactive detection of cyber risks before they are exploited.
3. Access is limited to vetted organisations meeting stringent security requirements.
4. Remains restricted due to concerns regarding potential misuse.

Significance

1. Strengthens vulnerability assessment and threat detection capabilities.
2. Enhances cybersecurity preparedness across critical sectors.
3. Demonstrates the growing integration of AI into cyber defence systems.

Key Indian Stakeholders

The programme is expected to support major Indian agencies involved in cybersecurity and critical infrastructure protection, including:

1. Indian Cyber Crime Coordination Centre
2. Indian Computer Emergency Response Team
3. National Critical Information Infrastructure Protection Centre
4. Digital Intelligence Platform

Selected cybersecurity research institutions and technology teams may also be included.

Significance for India

Strengthening Critical Infrastructure Security: India's banking systems, power grids, telecommunications networks, and other critical digital assets are increasingly

vulnerable to sophisticated cyber threats. Access to advanced AI-driven cybersecurity tools can significantly improve their protection.

Key Benefits

1. Early identification and remediation of software vulnerabilities.
2. Improved cyber resilience against advanced cyberattacks.
3. Faster detection and response to emerging threats.
4. Enhanced protection of critical national infrastructure.

Challenges and Way Forward

Challenges	Way Forward
Potential misuse of advanced AI for offensive cyber operations	Establish robust AI safety standards, monitoring mechanisms, and accountability frameworks
Dependence on foreign-controlled frontier AI technologies	Promote indigenous AI research, innovation, and cybersecurity capabilities
Vulnerabilities in critical digital infrastructure	Strengthen continuous vulnerability assessment, threat monitoring, and cyber resilience measures
Absence of global norms governing AI use in cybersecurity and defence	Support international cooperation and the development of responsible AI governance frameworks
Shortage of skilled AI and cybersecurity professionals	Invest in specialised training, research, and workforce development programmes

Conclusion

Project Glasswing illustrates the growing role of artificial intelligence in cybersecurity and national security. For India, access to advanced AI-driven vulnerability detection tools can strengthen the protection of critical infrastructure and enhance cyber resilience. However, maximising these benefits will require stronger indigenous capabilities, robust AI governance frameworks, and international cooperation to ensure the secure and responsible use of frontier technologies.

4. Indian Navy's Triple Commissioning: Strengthening Maritime Security and Indigenous Capability

Context

The Indian Navy recently commissioned three indigenously built vessels—**INS Dunagiri**, **INS Sanshodhak**, and **INS**



Agray—at Kolkata. The induction strengthens India's combat readiness, maritime awareness, and coastal security while advancing the objectives of **Aatmanirbhar Bharat** in defence manufacturing.

INS Dunagiri

1. **INS Dunagiri** is a stealth guided-missile frigate developed under **Project 17A**.
2. It is equipped with **BrahMos missiles, MRSAM systems, advanced radar, sonar, electronic warfare suites, and anti-submarine warfare capabilities**.
3. Designed for **blue-water operations**, it enhances the Navy's multi-dimensional combat capability across surface, air, and underwater domains.
4. It forms part of the next generation of frigates being inducted to strengthen India's long-range maritime power.

INS Sanshodhak

1. **INS Sanshodhak** is a **Survey Vessel Large (SVL)** designed for hydrographic and oceanographic surveys.
2. It conducts hydrographic and oceanographic surveys by mapping seabed features, water depths, navigational channels, and ocean conditions.
3. The vessel is equipped with **Autonomous Underwater Vehicles (AUVs), Remotely Operated Vehicles (ROVs), and multi-beam echo sounders**.
4. It supports safe navigation, submarine route planning, coastal development, and disaster-response operations.

INS Agray

1. **INS Agray** is an **Arnala-class Anti-Submarine Warfare Shallow Water Craft (ASW-SWC)**.
2. It is equipped with lightweight torpedoes, indigenous anti-submarine rocket launchers, and advanced sonar systems.
3. The vessel is designed to detect and neutralise submarines operating in shallow coastal waters.
4. It enhances the security of ports, naval bases, and critical coastal approaches.

Strategic Significance

1. Multi-Layered Naval Capability

The three vessels strengthen distinct dimensions of naval capability:

- a. **INS Dunagiri** – Blue-water combat and power projection.
- b. **INS Sanshodhak** – Maritime domain awareness and hydrographic support.

- c. **INS Agray** – Coastal defence and anti-submarine warfare.

Together, they contribute to a comprehensive and layered maritime security architecture.

2. Strengthening India's Maritime Posture

- a. The induction enhances India's ability to safeguard its interests across the **Indian Ocean Region (IOR)** and the wider **Indo-Pacific**.
- b. It improves preparedness against conventional and emerging maritime security challenges.
- c. The expanded capabilities strengthen India's ability to secure critical sea lanes of communication and safeguard its maritime interests.

3. Advancing Aatmanirbhar Bharat

- a. All three vessels were constructed by **Garden Reach Shipbuilders & Engineers (GRSE), Kolkata**.
- b. Their commissioning reflects the growing maturity of India's indigenous naval shipbuilding ecosystem.
- c. The participation of numerous domestic industries and MSMEs highlights the strengthening of the country's defence manufacturing base.

Conclusion

The commissioning of **INS Dunagiri**, **INS Sanshodhak**, and **INS Agray** marks an important milestone in India's naval modernisation. By strengthening **blue-water operations, maritime domain awareness, and coastal defence**, the three vessels significantly enhance India's maritime preparedness while reinforcing self-reliance in defence production.

5. Seafarer Safety and Maritime Security in Conflict Zones

Context

The deaths of three Indian seafarers aboard the merchant vessel **Settebello** have highlighted the growing risks faced by civilian mariners operating in conflict-affected maritime regions. The incident has renewed focus on strengthening seafarer protection and maritime security amid rising geopolitical tensions.

Institutional Framework for Seafarer Welfare

1. **Directorate General of Shipping (DGS):** It is India's apex maritime regulator responsible for:
 - a. Seafarer training, certification, and welfare.
 - b. Issuance of Continuous Discharge Certificates



- (CDCs).
- c. Implementation of the Maritime Labour Convention (MLC), 2006.
 - d. Maintenance of a national database of Indian seafarers.
2. **National Shipping Board:** It advises the government on:
- a. Shipping and merchant marine policies.
 - b. Maritime sector development.
 - c. Measures relating to seafarer welfare and safety.
3. **Skill Development Initiatives:** India promotes maritime workforce development through:
- a. Pre-sea and apprenticeship training programmes.
 - b. Capacity-building and certification of maritime professionals.
 - c. Recognition of Prior Learning (RPL) for experienced seafarers.

Maritime Security Framework

1. **Maritime Domain Awareness:** India has strengthened maritime surveillance through:
- a. **Information Fusion Centre–Indian Ocean Region (IFC-IOR).**
 - b. Coordination among the Indian Navy, Coast Guard, and maritime authorities.
 - c. Real-time monitoring and intelligence-sharing mechanisms.
2. **Security and Rescue Measures:**
- a. Naval deployments in piracy-prone waters, including the Gulf of Aden.
 - b. Adoption of Best Management Practices (BMPs) for vessels operating in high-risk areas.
 - c. Maritime Rescue Coordination Centres (MRCCs) for search-and-rescue operations.
 - d. Rapid response capabilities during maritime emergencies.

Significance

1. Enhances the safety and welfare of Indian seafarers.
2. Strengthens maritime security and resilience of global supply chains.
3. Supports freedom of navigation and adherence to international maritime law.
4. Reinforces India's position as a major maritime nation and leading provider of seafaring manpower.
5. Strengthens India's role as a net security provider in

the Indian Ocean Region (IOR).

6. Highlights the importance of integrating seafarer welfare into maritime security policy.
7. Underscores the need for coordinated diplomatic, regulatory, and security responses to evolving maritime threats.

Challenges and Way Forward

Challenges	Way Forward
Growing exposure of seafarers to conflicts and security threats.	Strengthen maritime risk assessment mechanisms and issue timely advisories for high-risk regions.
Inadequate risk communication before deployment in conflict-prone areas.	Ensure mandatory risk disclosure and informed consent prior to deployment.
Legal uncertainty arising from multiple sanctions regimes.	Develop clear compliance guidelines for shipowners and seafarers.
Persistent threats from piracy, armed attacks, and maritime terrorism.	Enhance naval deployments, surveillance capabilities, and maritime security cooperation.
Delays in emergency response during crises.	Strengthen search-and-rescue infrastructure and rapid response systems
Fragmented coordination among stakeholders.	Establish an integrated inter-ministerial maritime security framework involving regulators, security agencies, shipowners, and seafarers' representatives.
Balancing seafarer welfare with trade and employment considerations.	Adopt a calibrated approach based on periodic threat assessments rather than blanket restrictions.
Gaps in real-time intelligence dissemination.	Strengthen maritime domain awareness and improve intelligence-sharing networks.

Conclusion

As maritime trade increasingly intersects with geopolitical conflicts, safeguarding seafarers must become a core component of maritime governance. Strengthening risk assessment, intelligence sharing, security preparedness, and stakeholder coordination will be essential for protecting Indian seafarers and securing India's maritime interests.

6. Long Range Land Attack Cruise Missile (LRLACM): India's Indigenous Precision Strike Capability

Context

Recently, DRDO achieved a significant milestone in indigenous defence research with the successful validation of the Long -Range Land Attack Cruise Missile (LRLACM), a system developed to enhance India's long-range precision engagement capability.

About Long Range Land Attack Cruise Missile (LRLACM)

1. The **Long Range Land Attack Cruise Missile (LRLACM)** is an indigenous **subsonic, surface-launched cruise missile** developed for precision engagement of land-based targets at extended ranges.
2. It strengthens India's capability to conduct long-range conventional strikes with high accuracy.

Key Features

1. Possesses a strike range of nearly **1,000 km** and can carry a **450 kg conventional warhead**.
2. Integrates **inertial navigation, satellite-assisted guidance, and terminal guidance systems** for precise target engagement.
3. Operates at **low altitudes with terrain-hugging flight profiles**, reducing the chances of detection and interception.
4. Powered by a **turbofan/turbojet propulsion system**, enabling sustained long-range flight.
5. Capable of engaging **high-value military assets**, including command centres, logistics hubs, radar installations, and strategic infrastructure.

Development

1. Developed by the **Aeronautical Development Establishment (ADE), Bengaluru**, with contributions from various **DRDO laboratories** and Indian industry partners.
2. Reflects the growing role of indigenous research and industry participation in India's missile development programme.

7. INS Baaz and Its Strategic Significance

Context

The government has decided to develop a new **civil-**

military airport under the **Great Nicobar Project**, rather than expanding the existing naval air station at **INS Baaz**. This move is expected to strengthen connectivity and support the island's long-term strategic and economic development.

About INS Baaz

1. **INS Baaz** is a naval air station situated near **Campbell Bay** on **Great Nicobar Island** in the Andaman and Nicobar Islands.
2. Commissioned on **31 July 2012**, it was the **first air station established in the Nicobar Islands**.
3. It operates under the **Andaman and Nicobar Command (ANC)**, India's only integrated tri-services command.
4. As the **southernmost air station of the Indian Armed Forces**, it strengthens India's strategic presence in the **Indian Ocean Region (IOR)**.
5. Its location near the **Strait of Malacca** and the **Six Degree Channel** provides a strategic advantage for monitoring vital maritime routes.
6. The station plays an important role in **intelligence, surveillance, and reconnaissance (ISR)** operations across the Indian Ocean.
7. It serves as a base for **Dornier Do 228** maritime reconnaissance aircraft and is also capable of operating **C-130J Super Hercules** transport aircraft.
8. The airfield has a **3,500-foot (1,100 m) runway**, which is planned to be extended to support the operation of heavier aircraft.

8. Drone Warfare: Reshaping Contemporary Military Operations

Context

Recent conflicts in **Ukraine, Lebanon, and West Asia** have demonstrated the increasing centrality of drones in warfare. Their widespread deployment has transformed battlefield operations and altered traditional approaches to military power and conflict management.

Concept of Drone Warfare

Drone warfare refers to the employment of **Unmanned Aerial Systems (UAS)** for military purposes, including surveillance, reconnaissance, targeting, combat missions, logistics support, and electronic warfare. Their affordability, scalability, and versatility have made them integral to modern military strategies.



Types of Military Drones

1. **Reconnaissance Drones:** Used for intelligence collection, surveillance, and battlefield awareness.
2. **Strike Drones:** Armed systems designed to engage enemy personnel, equipment, and infrastructure.
3. **Loitering Munitions:** Platforms capable of remaining airborne before identifying and attacking targets.
4. **FPV (First-Person View) Drones:** Remotely controlled drones employed for highly precise attacks on tactical targets.

Transformation of Warfare

The proliferation of drones has challenged the traditional link between military strength and expensive conventional platforms. Drones now support a wide spectrum of operations, including:

1. Intelligence, Surveillance and Reconnaissance (ISR)
2. Target acquisition and battlefield coordination
3. Precision engagement of enemy assets
4. Electronic warfare operations
5. Logistics and tactical support

This has created an environment where battlefield visibility is significantly enhanced and operational secrecy is increasingly difficult to maintain.

Ukraine: The Rise of Drone-Intensive Warfare

The Russia-Ukraine conflict has emerged as a major example of large-scale drone integration in combat.

Ukraine initially modified commercially available drones for reconnaissance and strike missions. Over time, drones became indispensable for battlefield awareness, target engagement, and attacks on military infrastructure and supply chains.

FPV Drones

FPV drones have become one of the most widely used systems in the conflict.

Their roles include:

1. Precision attacks against armoured vehicles and military positions.
2. Delivery of explosive payloads on tactical targets.
3. Long-range strikes on logistics facilities and critical infrastructure.

Their effectiveness highlights how inexpensive systems can generate substantial battlefield impact.

Loitering Munitions: It provides the ability to search for targets before conducting precision strikes, enhancing operational flexibility and responsiveness.

Fibre-Optic Drones: A significant innovation has been the emergence of **fibre-optic drones**, which use fibre-optic cables instead of radio-frequency links for communication. This reduces vulnerability to electronic jamming and improves performance in contested electromagnetic environments.

Iran's Approach to Drone Warfare

Iran employs drones as instruments of deterrence and regional influence. Through indigenous development and support to allied groups, it has expanded its ability to project power and impose costs on adversaries across West Asia without relying on expensive conventional assets.

Changing Economics of Conflict

The increasing use of drones has altered the cost structure of warfare:

1. Affordable systems can neutralize high-value military assets.
2. Manufacturing capacity has become a strategic advantage.
3. Sustained innovation is essential to maintain operational effectiveness.
4. Long-term military competitiveness increasingly depends on the ability to adapt to evolving technologies.

Challenges Associated with Drone Warfare

1. Greater exposure of military bases and critical infrastructure to low-cost attacks.
2. Difficulties in detecting and intercepting small unmanned systems.
3. Wider availability of drone technology to non-state actors and terrorist organisations.
4. Rising importance of cyber and electronic warfare capabilities.
5. Regulatory and ethical concerns surrounding autonomous weapon systems.

Implications for India

India faces growing drone-related security challenges along both its western and northern frontiers, making preparedness a strategic necessity.

Key Priorities

1. Promote indigenous drone development through initiatives such as **Make in India** and **iDEX**.
2. Strengthen counter-drone capabilities through both kinetic and electronic measures.
3. Expand capacities in swarm drones and unmanned



combat systems.

4. Invest in advanced technologies, including **fibre-optic drones** and AI-enabled platforms.
5. Enhance coordination among the armed forces, **DRDO**, start-ups, and private industry.
6. Develop a resilient defence manufacturing ecosystem capable of rapid innovation and scale.

Significance

1. Illustrates the growing role of unmanned systems in military operations.
2. Reduces the cost barrier to precision-strike capabilities, altering traditional military power equations.
3. Narrows the distinction between conventional and asymmetric warfare.
4. Increases the relevance of automation, artificial intelligence, and electronic warfare in conflict.
5. Encourages military organisations to adapt doctrine, force structures, and procurement strategies to emerging technologies.

Conclusion

Drone warfare has become a defining feature of twenty-first-century conflict. As military effectiveness increasingly depends on technological adaptability and innovation, the ability to develop, deploy, and counter advanced unmanned systems will play a decisive role in shaping future security outcomes.

9. Burevestnik: Russia's Nuclear-Powered Cruise Missile

Context

Russia's Burevestnik cruise missile recently attracted global attention after a new study suggested that its nuclear-powered propulsion system may release radioactive material during flight.

About Burevestnik Missile

1. **Burevestnik** (meaning "*Storm Petrel*") is a **ground-launched, nuclear-powered, nuclear-capable cruise missile** developed by **Russia**.
2. It is regarded as the **world's first nuclear-powered cruise missile** and was unveiled by the Russian President in **2018** as one of **six advanced strategic weapon systems**.
3. The missile is designated **SSC-X-9 Skyfall** under the **NATO** reporting system.
4. Powered by a **compact nuclear reactor**, it is designed for **long-endurance missions**, enabling it to remain

airborne for prolonged periods and approach targets from unexpected directions.

5. It flies at **very low altitudes**, making detection by radar and interception by enemy air-defence systems more difficult.
6. The combination of **nuclear propulsion** and a **low-altitude flight profile** enhances its ability to penetrate advanced air-defence networks.

10. Asymmetric Warfare and Fibre-Optic Drones

Context

Recent conflicts in Southern Lebanon and the Russia–Ukraine war have highlighted the growing significance of fibre-optic drones. Their effectiveness despite advanced electronic warfare measures underscores the increasing role of disruptive technologies in modern warfare.

Asymmetric Warfare

Asymmetric warfare refers to a conflict between actors with unequal military capabilities, resources, or technological strength. In such situations, the weaker side relies on unconventional tactics and cost-effective technologies to offset conventional disadvantages and impose disproportionate costs on a stronger adversary.

Key Features

1. Use of irregular forces and guerrilla tactics.
2. Reliance on low-cost and innovative technologies.
3. Exploitation of vulnerabilities in conventional military systems.
4. Emphasis on mobility, surprise, and adaptability.

Evolution of Drone Warfare

Drones were initially employed for surveillance, reconnaissance, and intelligence gathering. Technological advancements have transformed them into offensive platforms capable of precision strikes, loitering missions, explosive delivery, and swarm operations.

Recent conflicts have demonstrated their ability to threaten armoured vehicles, artillery systems, and advanced air-defence networks, significantly altering battlefield dynamics.

Fibre-Optic Drones

Fibre-optic drones are unmanned aerial vehicles controlled through a fibre-optic cable instead of radio-frequency or satellite-based communication systems. The cable provides a secure and uninterrupted channel for transmitting commands and operational data in real time.



Key Characteristics

1. High-speed and secure data transmission.
2. Real-time control and operational feedback.
3. Limited dependence on GPS and radio communications.
4. Minimal electronic signature.
5. Secure communication over extended operational distances.

Advantages

1. **Resistance to Electronic Warfare:** Largely immune to jamming, spoofing, and signal interception.
2. **Enhanced Precision:** Real-time data exchange improves navigation, situational awareness, and targeting accuracy.
3. **Cost-Effectiveness:** Delivers significant combat capability at relatively low cost.
4. **Low Detectability:** Minimal electromagnetic emissions make detection and tracking difficult.

Limitations

1. Performance may be affected by adverse weather conditions.
2. Fibre-optic cables can become entangled with terrain or obstacles.
3. Damage to the cable can immediately disrupt communication.
4. Operational flexibility may be lower than that of fully wireless drones.

Implications for India

The increasing use of drones, loitering munitions, and swarm technologies in contemporary conflicts highlights the need for stronger counter-drone preparedness. Fibre-optic drones pose a particular challenge as traditional electronic warfare measures may be less effective against them.

India should strengthen advanced radar and sensor networks, AI-enabled detection systems, integrated air-defence frameworks, and hard-kill counter-drone

capabilities. Simultaneously, it must accelerate indigenous development of anti-drone technologies and integrate drone warfare scenarios into military planning, training, and operational doctrines.

Conclusion

Fibre-optic drones exemplify the transformation of asymmetric warfare, where technological innovation and cost-effectiveness increasingly shape battlefield outcomes. Their growing deployment underscores the need for adaptive military doctrines, indigenous technological capabilities, and resilient counter-drone systems to address emerging security challenges.

11. Project UDAYAK: Strengthening Strategic Connectivity in India's Eastern Frontier

Context

“The Border Roads Organisation (BRO) recently marked the 37th Raising Day of Project UDAYAK, which supports strategic connectivity in India's eastern border areas.”

About Project UDAYAK

1. It was established on 1st June 1990 at **Doomdooma, Assam**, to promote infrastructure development in India's far-eastern region.
2. The name “**UDAYAK**” means “**Rising Sun**”, as its area of responsibility includes the region that receives the country's first sunrise.
3. It develops and maintains strategic road infrastructure in **Arunachal Pradesh** and parts of **Assam**.
4. It enhances connectivity in border areas along the **Line of Actual Control (LAC)** and the **India–Myanmar border**.
5. It is currently constructing roads and border-fencing infrastructure along the India–Myanmar border, supporting border management, regional connectivity, and national security.

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ECONOMY

1. Assam–Nagaland Oil Exploration Agreement

Context

The Union Government, Assam, and Nagaland have signed a tripartite MoU to resume oil and gas exploration in the **Disputed Area Belt (DAB)** along their border. Exploration in this hydrocarbon-rich region had remained suspended for nearly three decades due to boundary disputes and security concerns. The agreement seeks to facilitate resource development without affecting the ongoing territorial dispute.

Key Features of the MoU

- Covers over **1,000 sq km** of the disputed border region.
- Establishes a coordinated mechanism for petroleum exploration and production.
- Provides a framework for operational coordination and security management.
- Enables exploration activities without affecting the legal positions of either state in the boundary dispute.
- Recognises hydrocarbon resources in the region as assets of national importance.
- Extends exploration beyond previously identified oil and gas fields to other prospective areas.

Significance

- Energy Security:** India remains heavily dependent on imported hydrocarbons:
 - More than **88% of crude oil requirements** are met through imports.
 - Nearly **50% of natural gas demand** relies on external sources.

In this context, enhanced domestic production can:

- Reduce import dependence.
 - Strengthen energy security.
 - Mitigate risks arising from geopolitical disruptions and supply shocks.
 - Advance the objective of **energy self-reliance (Atmanirbhar Bharat)**.
- Hydrocarbon Potential:**
The Northeast possesses substantial untapped

petroleum resources.

- Assam accounts for nearly **22% of India's crude oil reserves** and around **15% of natural gas reserves**.
- Nagaland contains significant hydrocarbon prospects within the **Naga-Schuppen Belt**, a part of the **Assam–Arakan Basin**.

The agreement provides a framework for harnessing untapped reserves and enhancing the Northeast's contribution to India's energy security.

Developmental Significance

The MoU is expected to:

- Attract investment into resource-rich regions.
- Generate employment and livelihood opportunities.
- Enhance state revenues.
- Improve infrastructure in border areas.
- Support the economic integration of the Northeast with national development priorities.

Challenges and Way Forward

Challenges	Way Forward
Unresolved boundary disputes may create future operational and administrative uncertainties.	Strengthen institutional dialogue, confidence-building measures, and co-ordination mechanisms between the two states.
Exploration activities may affect ecologically sensitive regions	Ensure strict environmental safeguards and adopt sustainable extraction practices.
Concerns related to land rights, resource ownership, and benefit-sharing may emerge among local communities.	Promote community participation, transparent consultations, and equitable sharing of developmental gains.
Infrastructure deficiencies in remote border areas may hinder exploration and production.	Invest in transport, communication, and energy infrastructure to support resource development.
Security and governance challenges could affect project implementation.	Enhance coordination among central agencies, state governments, and local stakeholders.



Conclusion

The Assam–Nagaland Oil Exploration Agreement demonstrates how cooperative governance can unlock strategic resources despite unresolved territorial disputes. By advancing energy security, regional development, and cooperative federalism, it offers a pragmatic model for converting long-standing disputes into opportunities for shared growth.

2. RBI Surplus Transfer and Its Implications

Context

The Reserve Bank of India (RBI) has approved a record surplus transfer of **₹2.87 lakh crore** to the Union Government for FY 2025–26, the highest-ever transfer by the central bank. While the transfer is in accordance with the **Economic Capital Framework (ECF)**, its scale has revived discussions on central bank independence, fiscal policy, and fiscal federalism.

Sources of RBI Surplus

The RBI generates income through:

1. Interest earned on government securities.
2. Returns from foreign exchange reserves and gold holdings.
3. Foreign exchange market operations.
4. Reserve and investment management activities.

Strong earnings from these sources, coupled with the expansion of the RBI's balance sheet, contributed to the record surplus.

Economic Capital Framework (ECF)

1. The surplus transfer is governed by the **Economic Capital Framework (ECF)** adopted in 2019 based on the recommendations of the **Bimal Jalan Committee**.
2. The framework determines the level of contingency reserves and risk buffers to be maintained by the RBI before transferring surplus to the government.
3. The current transfer has been made within the provisions of this framework.

Significance of the Transfer

1. Creates additional fiscal space without increasing taxes or borrowings.
2. Supports fiscal consolidation and reduces pressure on government finances.
3. Strengthens the government's capacity to fund developmental and welfare expenditure.
4. Reflects the robustness of the RBI's balance sheet and

reserve management practices.

5. Enhances resilience against external shocks and global financial volatility.

Key Concerns

1. Fiscal-Monetary Interface

- a. Growing surplus transfers have increased the fiscal significance of RBI earnings.
- b. Persistent reliance on such transfers may create perceptions of **fiscal dominance**, where fiscal considerations influence monetary policy.
- c. Frequent dependence on central bank resources may blur the distinction between fiscal management and monetary functions.
- d. Preserving the RBI's operational autonomy remains essential for maintaining policy credibility and investor confidence.

2. Fiscal Federalism

- a. RBI surplus is treated as **non-tax revenue** of the Union Government.
- b. It does not form part of the divisible pool shared with States through Finance Commission recommendations.
- c. Consequently, States receive no automatic share despite bearing substantial expenditure responsibilities in sectors such as health, education, and social welfare.
- d. This has raised concerns regarding the growing concentration of fiscal resources at the Union level and its implications for cooperative federalism.

Way Forward

1. Safeguard the RBI's independence and institutional credibility.
2. Ensure strict adherence to the Economic Capital Framework.
3. Maintain transparency in surplus calculation and transfer mechanisms.
4. Strengthen Centre–State fiscal coordination to promote balanced fiscal federalism.
5. Ensure that surplus transfers remain guided by prudential considerations rather than short-term fiscal requirements.
6. Balance immediate fiscal needs with long-term monetary and financial stability objectives.

Conclusion

The record surplus transfer underscores the RBI's strong financial position and provides additional fiscal space



to the government. However, preserving central bank independence, fiscal discipline, and cooperative federalism remains crucial for ensuring long-term macroeconomic stability, policy credibility, and institutional integrity.

3. NRI Deposits and RBI Measures to Strengthen External Sector Stability

Context

The Reserve Bank of India (RBI) has temporarily relaxed interest rate restrictions on select **FCNR(B)** and **NRE** deposits and introduced a concessional swap facility to attract higher foreign currency inflows from Non-Resident Indians (NRIs). The initiative seeks to enhance foreign exchange liquidity, support the rupee, and strengthen India's external sector resilience.

NRI Deposit Accounts: A Comparison

Account Type	Currency	Primary Purpose	Tax Treatment	Repatriability
FCNR(B)	Foreign Currency	Foreign currency savings and investments	Interest is tax-free in India	Fully repatriable
NRE	Indian Rupees	Parking overseas earnings in India	Interest is tax-free in India	Fully repatriable
NRO	Indian Rupees	Managing income earned in India	Interest is taxable in India	Subject to prescribed conditions

RBI's Recent Measures

1. Relaxation of Interest Rate Ceilings

- a. Interest rate ceilings have been withdrawn on:
 - Fresh **FCNR(B)** deposits with maturities between **three and five years**.
 - Fresh **NRE** deposits with maturities of **three years and above**.
- b. The relaxation will remain effective from **17 June 2026 to 30 September 2026**.
- c. Transfers from NRO accounts to NRE accounts are not eligible for this benefit.

2. Concessional Swap Facility

- a. Banks generally hedge FCNR(B) deposits against exchange rate fluctuations, increasing their

funding costs.

- b. The RBI's special swap facility lowers hedging costs by absorbing a part of the exchange rate risk.
- c. This enables banks to offer more attractive returns on FCNR(B) deposits and encourages higher NRI participation.

Objectives of the Measures

1. Attract higher NRI deposits and foreign currency inflows.
2. Strengthen foreign exchange reserves.
3. Improve foreign currency liquidity in the banking system.
4. Support exchange rate stability.
5. Enhance resilience of the external sector.

Significance for the Economy

1. Mobilises relatively stable and non-debt creating foreign capital from the Indian diaspora.
2. Strengthens foreign exchange reserves, balance of payments stability, and external sector resilience.
3. Enhances foreign currency liquidity within the banking system.
4. Supports the rupee during periods of global financial uncertainty.
5. Reduces funding pressures on banks and improves access to foreign currency resources.
6. Increases the economy's capacity to withstand external shocks and volatile capital flows.

Conclusion

The RBI's measures reflect a proactive approach to leveraging NRI savings for strengthening India's external sector. By attracting stable foreign currency inflows, improving liquidity conditions, and reinforcing foreign exchange reserves, the initiative can enhance macroeconomic stability and improve India's resilience to global financial volatility.

4. India's Ethanol Blending Programme: Beyond E20

Context

The Government has exempted higher ethanol-petrol blends (22–30% ethanol) from central excise duty and proposed recognition of **E85** and **E100** fuels under the Central Motor Vehicles Rules. These measures indicate India's gradual transition towards higher ethanol blends and the promotion of flex-fuel mobility as part of its broader biofuel strategy.



Understanding Ethanol Blending

Ethanol blending involves mixing ethanol, primarily derived from sugarcane and food grains, with petrol.

1. **E20**: 20% ethanol and 80% petrol.
2. **E85**: 85% ethanol and 15% petrol.
3. **E100**: 100% ethanol fuel.

India achieved its **20% ethanol blending target in 2025**, ahead of the scheduled timeline.

Rationale for Higher Ethanol Blending

1. **Energy Security**
 - a. Reduces dependence on imported crude oil.
 - b. Enhances energy self-reliance.
 - c. Reduces vulnerability to geopolitical disruptions and global oil price fluctuations.
2. **Agricultural Benefits**
 - a. Creates a stable market for sugarcane and surplus food grains.
 - b. Enhances farmers' income opportunities.
 - c. Supports diversification of agricultural demand.
3. **Environmental Benefits**
 - a. Reduces reliance on fossil fuels.
 - b. Lowers vehicular emissions.
 - c. Supports clean energy transition and climate objectives.

Key Concerns

1. **Vehicle Compatibility**: Higher ethanol blends may affect vehicles not specifically designed for such fuels, resulting in:
 - a. Corrosion of engine and fuel-system components.
 - b. Lower fuel efficiency.
 - c. Cold-start difficulties.
 - d. Reduced performance in older vehicles.
2. **Consumer Concerns**
 - a. Limited fuel choice at retail outlets.
 - b. Potential increase in maintenance costs.
 - c. Absence of pricing incentives for higher ethanol blends.
 - d. Uncertainty regarding long-term vehicle performance.
3. **Industry Challenges**
 - a. Requirement for engine recalibration and durability testing.
 - b. Additional compliance costs for automobile manufacturers.

- c. Logistical challenges in handling multiple fuel blends.

4. Feedstock Sustainability

- a. Excessive dependence on sugarcane may increase pressure on water resources.
- b. Diversion of food grains towards ethanol production may raise concerns regarding food security and resource allocation.
- c. Long-term expansion requires diversification of feedstock sources.

Lessons from Brazil

Brazil's ethanol programme highlights the importance of:

1. Phased implementation of blending targets.
2. Large-scale adoption of flex-fuel vehicles.
3. Consumer choice among different fuel options.
4. Pricing incentives to encourage ethanol use.
5. Protection of consumers during transitions to higher blending standards.
6. Stable policy support and long-term planning.

The Brazilian experience demonstrates that successful ethanol adoption depends on infrastructure readiness, market incentives, and consumer acceptance.

Challenges and Way Forward

Challenges	Way Forward
Balancing energy security objectives with consumer interests.	Adopt a phased transition supported by adequate consumer safeguards and awareness programmes.
Ensuring readiness of the automobile and fuel distribution ecosystem.	Provide sufficient transition timelines and strengthen industry–government coordination.
Developing a robust flex-fuel vehicle ecosystem.	Promote flex-fuel vehicle manufacturing and expand fuel choices at retail outlets.
Ensuring sustainable and diversified feedstock availability.	Encourage second-generation biofuels, agricultural residues, and non-food feedstocks.
Managing environmental concerns associated with water-intensive crops.	Promote resource-efficient cultivation practices and region-specific feedstock strategies.

Conclusion

India's ethanol blending programme is a significant step towards energy security, cleaner mobility, and rural



economic growth. However, its long-term success will depend on a phased transition, sustainable feedstock management, technological preparedness, and adequate consumer safeguards. A balanced approach that aligns environmental objectives with economic and social considerations will be crucial for the sustainable expansion of India's biofuel ecosystem.

5. From WPI to PPI: Strengthening India's Producer Inflation Framework

Context

The Government of India will introduce a revised **WPI (Base Year: 2022–23)** from June 2026 and simultaneously launch a **Producer Price Index (PPI)** framework. Both indices will coexist for five years, with WPI likely to be phased out by 2031.

Producer Price Index (PPI)

PPI measures changes in prices received by producers for output and paid for inputs, thereby reflecting producer-level inflation.

Key Features of the Reform

- Revised WPI**
 - Base year revised to **2022–23**.
 - Commodity basket expanded from **697 to 957 items**.
 - Includes emerging sectors such as solar, wind, and nuclear energy.
- Components of PPI**
 - Output PPI:** Measures prices received by producers.
 - Input PPI:** Measures prices paid for inputs.
 - Services PPI:** Covers banking, insurance, transport, telecommunications, and other major services.
- Rationale for the Shift to PPI**
 - Captures inflation across the entire production chain.
 - Incorporates the services sector, which is excluded from WPI.
 - Improves GDP estimation through better inflation deflators.
 - Supports evidence-based economic policymaking.
 - Aligns India with global statistical practices.
- Transition Strategy (2026–2031)**
 - Simultaneous release of WPI and PPI during the transition period.

- Continuation of existing WPI-linked contracts.
- Gradual adoption of PPI-based indexation.
- Eventual discontinuation of WPI after 2031.

Significance of the Reform

- Provides a comprehensive measure of producer inflation.
- Improves inflation transmission analysis.
- Enhances the accuracy of real GDP estimates.
- Strengthens economic planning and forecasting.
- Aligns India's statistical framework with international best practices.

Challenges and Way Forward

Challenges	Way Forward
Limited producer-level data	Strengthen statistical and digital data systems
Experimental nature of Input PPI	Pilot testing and methodological refinement
Transition from WPI-linked contracts	Clear guidelines and phased adoption
Measuring service-sector prices	Develop sector-specific methodologies
Low stakeholder awareness	Capacity building and outreach
Maintaining continuity with WPI data	Develop robust back-series and harmonisation mechanisms



Conclusion

The transition from WPI to PPI marks a significant step in modernising India's statistical architecture. By providing a broader measure of producer-level inflation, it can improve GDP estimation, economic policymaking, and the international comparability of Indian statistics.

6. Decentralised Solar Energy and India's Energy Transition

Context

India emerged as the world's second-largest contributor to solar capacity additions in 2025 after China, with solar energy accounting for nearly 30% of its installed electricity capacity. Despite this progress, flagship decentralised solar initiatives such as **PM Surya Ghar Yojana** and **PM-KUSUM** continue to lag behind their targets, highlighting important policy and implementation challenges.

Major Decentralised Solar Schemes

PM Surya Ghar Yojana



1. Aims to install rooftop solar systems in **one crore households**.
2. Provides financial assistance to support rooftop solar installations.
3. Seeks to reduce household dependence on conventional grid electricity and promote clean energy generation.

PM-KUSUM

1. Promotes solar-powered irrigation and decentralised renewable energy generation in the agricultural sector.
2. Supports installation of solar pumps and small solar plants on unused or underutilised land.
3. Enables farmers to lower energy costs and earn additional income through the sale of surplus electricity.

Current Status

1. The two schemes have achieved only a fraction of the targeted **40 GW decentralised solar capacity**, indicating a significant implementation gap.
2. PM-KUSUM has recorded relatively better progress in the deployment of standalone solar pumps.
3. Rooftop solar installations remain concentrated in a few states, reflecting substantial regional disparities.
4. State-level electricity pricing and subsidy policies have played a decisive role in determining scheme outcomes.

Impact of Electricity Subsidies on Solar Deployment

A major constraint to decentralised solar expansion is the widespread availability of free or heavily subsidised electricity.

Key Issues

1. Consumers have little incentive to invest in solar systems when electricity is available at negligible cost.
2. The upfront expenditure on solar installations remains a significant barrier.
3. The financial gains from rooftop solar decline when electricity bills are already minimal.
4. States with extensive electricity subsidies have generally witnessed lower participation in decentralised solar programmes.

This creates a policy paradox where subsidies designed to improve affordability inadvertently weaken incentives for renewable energy deployment.

Policy Measures to Improve Participation

Several states have sought to address this challenge by

supplementing central assistance with additional financial support.

Emerging Approaches

1. Providing state-level incentives to reduce installation costs.
2. Expanding financial assistance for households and farmers.
3. Promoting one-time asset creation in place of recurring consumption subsidies.

Potential Benefits

1. Encourages wider deployment of decentralised solar systems.
2. Reduces the burden of upfront investment.
3. Lowers future subsidy liabilities for state governments.
4. Promotes long-term energy self-reliance and sustainability.

Importance of Decentralised Solar Energy

1. Supporting India's Energy Transition

- a. Contributes to India's target of achieving **500 GW of non-fossil fuel capacity by 2030**.
- b. Expands renewable energy generation beyond utility-scale projects.

2. Efficient Land Utilisation

- a. Utilises rooftops and existing agricultural land.
- b. Reduces pressure on land acquisition for large solar parks.

3. Strengthening Energy Security

- a. Enhances local power generation capacity.
- b. Reduces transmission losses and dependence on centralised infrastructure.

4. Improving Grid Stability

- a. Distributed generation reduces pressure on the electricity grid.
- b. Helps meet peak electricity demand more effectively.

5. Enhancing Climate Resilience

- a. Supports electricity supply during periods of extreme weather and rising demand.
- b. Reduces vulnerability arising from climate-related stress on conventional energy systems.

6. Reducing Fiscal Burden

- a. Can gradually reduce dependence on recurring electricity subsidies.
- b. Replaces long-term consumption subsidies with productive energy assets.

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- c. Supports a transition towards sustainable and self-generating energy systems.

Challenges and Way Forward

Challenges	Way Forward
Free or heavily subsidised electricity reduces incentives for solar deployment	Align electricity subsidy policies with renewable energy objectives
High upfront cost of solar installations	Expand capital subsidies, concessional credit, and innovative financing mechanisms
Uneven implementation across states	Strengthen state-level execution and promote best-practice sharing
Limited awareness of long-term economic benefits	Intensify consumer awareness and outreach programmes
Large recurring subsidy burden on state governments	Gradually shift from consumption-based subsidies to asset-creation support for solar systems
Land constraints affecting large renewable energy projects	Promote rooftop, community-based, and farm-level solar generation

Conclusion

The experience of PM Surya Ghar Yojana and PM-KUSUM illustrates how policy incentives shape renewable energy outcomes. Moving from consumption-based subsidies to asset-based support, while improving affordability and implementation, will be critical for expanding decentralised solar energy and achieving India's long-term energy transition and climate goals.

7. End of the Era of Cheap Global Money and Its Implications for India

Context

The RBI's Annual Report 2025–26 highlights rising global bond yields and tighter monetary conditions, signalling the gradual end of the era of cheap global money that followed the 2008 Global Financial Crisis and the COVID-19 pandemic.

Core Concepts

1. Government Bonds

- a. Debt instruments issued by governments to raise funds.
- b. Offer periodic interest payments and repayment of principal at maturity.

2. Bond Yields

- a. Return earned on government bonds.
- b. Serve as benchmark interest rates across the economy.

3. Quantitative Easing (QE)

- a. Monetary policy under which central banks purchase financial assets using newly created money.
- b. Aims to increase liquidity and reduce borrowing costs.

Era of Cheap Global Liquidity

1. Ultra-low interest rates and large-scale quantitative easing.
2. Low inflation and abundant global liquidity.
3. Strong capital flows towards emerging economies.

Drivers of Tightening Global Liquidity

1. Resurgence of inflation due to supply-chain disruptions and geopolitical tensions.
2. Withdrawal of accommodative monetary policies by major central banks.
3. Rising sovereign debt and borrowing requirements.
4. Sustained increase in sovereign bond yields across advanced economies.

Implications for India

1. Reduced attractiveness of emerging-market assets, including those in India.
2. Greater volatility in capital flows and financial markets.
3. Pressure on the rupee and external-sector stability.
4. Higher borrowing costs for governments and businesses.
5. Increased challenges in financing the Current Account Deficit (CAD).

Significance

1. Marks a shift from liquidity-driven to fundamentals-driven capital flows.
2. Enhances the importance of macroeconomic stability and investor confidence.
3. Highlights the need for stronger domestic growth drivers and financial resilience.

Challenges and way forward

Challenges	Way forward
Tighter global liquidity conditions.	Maintain fiscal prudence and monetary stability.



Volatile capital flows.	Strengthen forex reserves and external-sector resilience.
Reduced attractiveness of Indian assets.	Improve the investment climate through structural reforms.
Higher borrowing costs.	Diversify funding sources and deepen capital markets.
Limited depth of domestic financial markets.	Develop bond and corporate debt markets.
Pressure on the rupee and external balances.	Ensure orderly exchange-rate management and external stability.
Structural bottlenecks affecting competitiveness.	Promote manufacturing, exports, and ease of doing business reforms.

Conclusion

The end of the cheap-money era marks a structural shift in global capital flows. In this evolving financial environment, India's long-term attractiveness will increasingly depend on macroeconomic stability, sustained growth, deeper financial markets, and continued structural reforms.

8. India-US Trade Relations and Ongoing Trade Negotiations

Context

India and the United States are in the final phase of negotiations for the first tranche of a bilateral trade agreement. The talks have gained importance amid changing trade patterns, a declining Indian trade surplus, and efforts by both countries to deepen economic cooperation while addressing market-access concerns.

India-US Trade Relations

1. India and the United States share one of the most significant bilateral economic partnerships in the world.
2. Bilateral goods trade was estimated at approximately **\$149.4 billion in 2025**.
3. Major Indian exports include **pharmaceuticals, engineering goods, petroleum products, textiles, gems and jewellery, electronics, and chemicals**.
4. Key US exports to India include **crude oil, LNG, defence equipment, agricultural products, machinery, aircraft components, electronics, and medical devices**.
5. Economic ties have expanded beyond merchandise

trade to encompass:

- a. **Services trade**, particularly information technology and business services.
- b. **Investment and technology partnerships**.
- c. Cooperation in **semiconductors, digital technologies, advanced manufacturing, energy, and defence sectors**.

Major Areas of Negotiation

1. United States' Priorities:

- a. Greater access for agricultural products and business opportunities in the Indian market.
- b. Reduction of tariffs on industrial goods.
- c. Expansion of energy exports to India.

2. India's Priorities:

- a. Improved access for Indian goods and services in the US market.
- b. Stable and predictable tariff arrangements.
- c. Protection of domestic agriculture from the adverse effects of heavily subsidised imports.

3. Changing Trade Dynamics:

- a. India's merchandise trade surplus with the United States has narrowed significantly during the ongoing negotiations.
- b. Rising imports of energy products, electronic components, chemicals, motor vehicles, scientific instruments, and other manufactured goods have contributed to this trend.
- c. The United States has also emerged as a major supplier of **LNG and LPG** to India.
- d. These developments indicate growing US market presence in several sectors and a gradual reduction in India's trade surplus.

4. Agriculture: The Most Sensitive Issue:

- a. Agriculture remains the most contentious area in the negotiations.
- b. Concerns have been raised regarding the impact of subsidised US agricultural products on Indian farmers.
- c. Commodities such as **apples, almonds, walnuts, soybean, cotton, and rubber** are considered particularly vulnerable.
- d. Farmer organisations have cautioned that greater access for subsidised imports could adversely affect domestic producers and rural livelihoods.
- e. The issue is closely linked to India's long-standing position in the **World Trade Organization**



(WTO) on agricultural subsidies and fair trade practices.

Strategic Dimension

- The negotiations are taking place against the backdrop of possible US trade measures under **Section 301**, a mechanism used to investigate and address perceived unfair trade practices.
- The proposed agreement is expected to provide greater certainty in bilateral trade and reduce the risk of future tariff-related disruptions.
- The talks also complement broader cooperation in areas such as technology, energy security, resilient supply chains, and strategic industries.

Significance

- The negotiations will influence India's future access to one of its largest export markets.
- The outcome will shape bilateral trade, investment flows, technology partnerships, and supply-chain cooperation.
- The negotiations could influence India's approach to agricultural trade and future WTO negotiations.
- The talks reflect India's broader objective of strengthening economic ties with the United States while safeguarding domestic manufacturing, agriculture, and trade policy autonomy.
- The negotiations could also enhance India's integration into global supply chains and emerging technology ecosystems.

Conclusion

The ongoing negotiations reflect the growing depth of India-US economic relations and their strategic importance in an evolving global trade environment. The success of the agreement will depend on achieving a balance between deeper economic integration and the protection of India's strategic and developmental interests.

9. Mule Accounts and Cyber Financial Fraud Networks

Context

A major cybercrime investigation by the **Gujarat Police** recently exposed a large-scale online fraud network worth over **₹2,289 crore**, with **mule accounts** being used to channel and conceal illegally obtained funds.

About Mule Accounts

- A **mule account** is a bank account used to **receive, transfer, or conceal illegally obtained funds**, often

as part of fraud and money-laundering schemes.

- The account holder, known as a **money mule**, may either knowingly participate in such activities or be unaware that the account is being misused.
- Criminal networks use these accounts to channel proceeds from **cyber fraud, online scams, drug trafficking, human trafficking, and other unlawful activities**.
- Mule accounts act as intermediaries, allowing illicit funds to pass through legitimate financial channels while concealing their source.
- Funds are often routed through multiple accounts or converted into different currencies to hide their origin and destination.
- This practice, known as **layering**, obscures the money trail and makes detection more difficult for financial institutions and law-enforcement agencies.

10. SEBI's Regulatory Overhaul and Capital Market Reforms

Context

The Securities and Exchange Board of India (SEBI) has initiated a comprehensive review of market regulations to strengthen corporate governance, enhance investor protection, deepen capital markets, and address emerging technological challenges.

Rationale for the Reforms

India's capital markets are expanding rapidly due to rising retail participation, technological advancements, and increasing global investor interest. In this context, SEBI seeks to:

- Strengthen governance and disclosure standards.
- Improve market efficiency and liquidity.
- Facilitate greater participation by domestic and foreign investors.
- Enhance risk management mechanisms.
- Support innovation-driven sectors requiring long-term capital.
- Develop appropriate regulatory frameworks for emerging technologies such as Artificial Intelligence (AI).

Key Reform Initiatives

- Corporate Governance and Disclosure Framework**
 - SEBI is reviewing the **Listing Obligations and Disclosure Requirements (LODR)** framework to improve transparency, compliance, and



governance standards.

- b. The delisting framework is also being reassessed to ensure a balanced and efficient mechanism for both market entry and exit.
2. **Strengthening the Role of Independent Directors**
 - a. Independent Directors are expected to play a greater role in addressing strategic issues such as AI, cybersecurity, ESG concerns, innovation, and technological disruption.
 - b. SEBI plans to strengthen capacity-building mechanisms to improve board effectiveness and protect minority shareholder interests.
3. **Facilitating Foreign Investment**
 - a. Simplification of KYC requirements for Foreign Portfolio Investors (FPIs) and Non-Resident Indians (NRIs).
 - b. Adoption of a risk-based disclosure framework to improve regulatory clarity and ease of investment.
 - c. These measures aim to enhance India's attractiveness as a global investment destination.
4. **Deepening Equity and Derivatives Markets**
 - a. Review of securities lending, borrowing, and short-selling regulations.
 - b. Measures to strengthen linkages between cash and derivatives markets and improve price discovery.
 - c. Promotion of longer-duration futures and options contracts to expand hedging opportunities.
 - d. Introduction of bond index derivatives in collaboration with the Reserve Bank of India (RBI).
5. **Commodity Derivatives Reforms**
 - a. Review of position limits and settlement mechanisms.
 - b. Extension of early pay-in benefits to options contracts.
 - c. Gradual expansion of physical settlement in selected agricultural commodity contracts.
 - d. These measures aim to improve market integrity, efficiency, and risk management.
6. **Municipal Debt and Portfolio Management Reforms**
 - a. Review of regulations governing municipal debt instruments and Portfolio Management Services (PMS).
 - b. Efforts to address operational constraints and improve market accessibility.

Supporting Innovation and Emerging Industries

1. **Revamping the Innovators Growth Platform (IGP)**
 - a. SEBI is strengthening the Innovators Growth Platform to improve capital access for high-growth sectors.
 - b. **Key focus areas include:**
 - I. Artificial Intelligence
 - II. Semiconductors
 - III. Clean Energy
 - IV. Biotechnology
 - V. Advanced Materials
 - VI. Defence Technology
2. **Deepening Debt Markets**
 - a. Introduction of a market-making framework to improve liquidity in the corporate bond market.
 - b. Expansion of the municipal bond market to support infrastructure financing by urban local bodies.
 - c. Exploration of corporate bond tokenisation to leverage financial technology innovations.
3. **Artificial Intelligence and Capital Market Regulation**
 - a. AI can strengthen market surveillance, fraud detection, risk assessment, compliance monitoring, and investor services.
 - b. At the same time, concerns relating to algorithmic bias, lack of transparency, data privacy, cybersecurity, and accountability require regulatory oversight.
 - c. To address these challenges, SEBI proposes a responsible AI framework aligned with international best practices, including the **IOSCO AI Supervisory Toolkit**.

Significance of the Reforms

1. Stronger corporate governance and investor confidence.
2. Greater transparency, compliance, and market integrity.
3. Deeper equity, debt, and derivatives markets.
4. Enhanced participation by domestic and foreign investors.
5. Improved access to capital for innovation-led sectors.
6. Increased resilience and global competitiveness of India's financial markets.

Conclusion



SEBI's regulatory overhaul reflects a proactive approach to adapting India's capital markets to evolving economic, technological, and investment realities. By strengthening governance standards, broadening market participation, promoting innovation, and addressing emerging risks, the reforms seek to create a transparent, resilient, and globally competitive capital market ecosystem.

11. Arbitrage Funds: Features, Benefits and Limitations

Context

Arbitrage funds are in focus as they seek to generate returns by exploiting temporary price differences between the cash and futures markets through a largely hedged investment strategy.

About Arbitrage Funds

1. Arbitrage funds are **equity-oriented hybrid mutual funds** that generate returns by exploiting temporary price differences between related securities or markets.
2. They exploit price mismatches between the **spot and futures markets** or across different trading platforms through simultaneous buy-and-sell transactions.
3. The strategy seeks to capture the price spread while largely eliminating directional market risk through hedged positions.
4. Unlike traditional equity funds, returns depend on market inefficiencies rather than sustained appreciation in stock prices.
5. Since arbitrage spreads are usually small and short-lived, fund managers execute multiple transactions to generate meaningful returns.
6. When suitable arbitrage opportunities are unavailable, a portion of the portfolio is invested in **short-term debt and money market instruments** to maintain liquidity and stability.
7. As per **SEBI regulations**, arbitrage funds must invest at least **65% of their assets in equities and equity-related instruments**, qualifying them as equity-oriented mutual funds.

Benefits of Arbitrage Funds

1. **Lower Risk Profile:** Hedged positions minimise exposure to market volatility.
2. **Tax Efficiency:** Being treated as equity-oriented funds, they enjoy favourable taxation compared to most debt-oriented schemes.
3. **High Liquidity:** Investments can generally be redeemed with ease.

4. **Portfolio Diversification:** Exposure to multiple securities and instruments helps reduce concentration risk.

Limitations of Arbitrage Funds

1. **Opportunity-Dependent Returns:** Performance depends on the availability of arbitrage opportunities in the market.
2. **Volatility-Linked Returns:** Lower market volatility can reduce arbitrage spreads and limit return potential.
3. **Moderate Return Potential:** Returns are generally lower than those of pure equity funds during strong bull markets.
4. **Limited Long-Term Growth Potential:** These funds prioritise capital preservation and stable returns over long-term wealth creation.

12. Digital Payment Frauds and RBI's Consumer Protection Framework

Context

The Reserve Bank of India (RBI) has introduced a revised compensation framework under the **RBI (Commercial Banks – Responsible Business Conduct) Third Amendment Directions, 2026** to strengthen consumer protection and improve compensation for victims of digital payment frauds. The revised provisions will apply to unauthorised electronic banking transactions from **1st January 2027**.

Growing Digital Fraud Landscape

India's rapid expansion of **UPI, mobile banking, internet banking, and card-based payments** has been accompanied by a sharp rise in digital financial frauds.

Common forms of fraud include:

1. Phishing, vishing, and OTP theft.
2. SIM swapping.
3. Fake UPI IDs and QR code scams.
4. AI-enabled deepfake and social engineering attacks.

Elderly citizens, first-time digital users, and rural consumers remain particularly vulnerable.

According to RBI, the banking sector reported over **36,000 fraud cases** involving nearly **₹13,930 crore** during **2023–24**.

RBI's Regulatory Measures

To strengthen digital payment security and consumer protection, the RBI has introduced multiple safeguards:

1. **Limited Liability Framework:** Customers bear zero or limited liability if unauthorised transactions are



reported within the prescribed timeline.

2. **Two-Factor Authentication (2FA):** Mandatory authentication for digital payment transactions.
3. **Real-Time Fraud Monitoring:** Banks are required to deploy real-time transaction monitoring systems and report major frauds to the **Central Fraud Registry**.
4. **Action Against Mule Accounts:** Banks must identify and freeze accounts used for routing fraudulently obtained funds.
5. **Financial Consumer Protection:** Initiatives such as **'100 Days 100 Pays'** reflect RBI's broader commitment to strengthening consumer protection and improving financial governance.

Persistent Challenges

Despite regulatory measures, several challenges continue:

1. Low digital awareness among vulnerable users.
2. Poor recovery of fraudulently transferred funds.
3. Difficulty in investigating cross-border frauds.
4. Rapidly evolving mule account networks.
5. Increasing use of AI-driven fraud techniques.

Revised Compensation Framework

Eligibility

A bona fide customer is eligible for compensation if the fraud is reported to the **National Cyber Crime Reporting Portal** or the **Cyber Crime Helpline (1930)** and the concerned bank within **five calendar days**. The benefit is available **once during the customer's lifetime**.

Compensation: For losses up to **₹50,000**, compensation will be **85% of the net loss or ₹25,000, whichever is lower**.

Liability Sharing

1. **Domestic fraud:** Compensation is shared among the RBI, the customer's bank, and the beneficiary bank according to the prescribed framework.
2. **Cross-border fraud:** Liability is shared between the RBI and the customer's bank.

Additional Provisions

1. **Credit card fraud:** Banks must provide a **shadow reversal** within **five calendar days** of receiving the complaint.
2. **Post-recovery adjustment:** Compensation must be revised if the defrauded amount is recovered subsequently.

Way Forward

Strengthening the digital payment ecosystem requires:

1. Enhancing digital and financial literacy.
2. Promoting AI-based fraud detection and real-time transaction monitoring.
3. Strengthening cybercrime investigation and inter-agency coordination.
4. Improving grievance redressal and fund recovery mechanisms.
5. Regularly updating cybersecurity regulations to address emerging threats.

Conclusion

As digital payments become central to India's financial ecosystem, strengthening consumer protection, cybersecurity, institutional coordination, and digital awareness will be essential to sustaining public trust, promoting financial inclusion, and ensuring a secure and resilient digital economy.

13. Drunix: NPCI's Distributed Ledger Technology Platform

Context

The National Payments Corporation of India (NPCI) has recently launched the Drunix platform, a distributed ledger technology framework aimed at enabling secure, scalable, and enterprise-grade blockchain applications.

About Drunix

1. **Drunix** is an enterprise-grade **Distributed Ledger Technology (DLT)** platform designed to support tokenisation, digital asset ecosystems, and multi-organisation blockchain networks.
2. It is a **private blockchain framework** built for high scalability, performance, and large-scale deployment across enterprise and public infrastructure.
3. Drunix is developed from an enhanced version of Hyperledger Fabric, an open-source enterprise blockchain framework.
4. **Hyperledger Fabric** is an open-source enterprise blockchain framework developed under the **Linux Foundation**.

Blockchain Technology and its key features

1. **Blockchain, or Distributed Ledger Technology (DLT)**, is a digital system for recording and managing transactions or assets across a network of computers without relying on a central authority.
2. **Distributed Ledger:** Data is stored across multiple nodes in a peer-to-peer network.
3. **Decentralisation:** Network control is distributed



among participants rather than a single entity.

4. **Consensus Mechanism:** Transactions are validated according to predefined network rules before being recorded.
5. **Immutability:** Once recorded, data is extremely difficult to alter or remove.
6. **Security:** Cryptographic techniques such as hashing and digital signatures ensure data integrity and participant authentication.

14. Employment Trends in India: Key Findings and Challenges

Context

Growing concerns over employment generation have shifted attention from headline GDP growth to the availability of productive and quality jobs. An analysis of CMIE data for **2016-17 to 2025-26** highlights important trends and structural issues in India's labour market.

Significance of Employment Rate

1. The **Unemployment Rate (UER)** measures unemployed persons as a proportion of the labour force.
2. Since individuals who stop actively seeking work are excluded from the labour force, the UER may not fully reflect labour market stress.
3. The **Employment Rate (ER)** measures the share of employed persons in the total working-age population.
4. As it is less affected by changes in labour force participation, ER provides a more comprehensive assessment of employment conditions.

Key Findings

1. **Declining Employment Rate**
 - a. India's Employment Rate declined from **42.7% in 2016-17 to 38.7% in 2025-26**.
 - b. Although total employment increased in absolute numbers, job creation lagged behind the growth of the working-age population.
 - c. Employment levels fell sharply during the COVID-19 period and have only partially recovered since then.
2. **Demographic and Social Trends**
 - a. Employment participation declined among both men and women, with the decline being more pronounced among women.
 - b. The steepest fall was observed in the **15-24 years** age group, indicating growing barriers to labour

market entry for youth.

- c. Employment rates declined across all educational categories, indicating that education alone has not insulated workers from weakening employment prospects.
- d. Similar trends across caste, religious, and social groups indicate that the employment challenge is broad-based and structural in nature.

3. Central Concern

- a. The decline in the Employment Rate despite sustained economic growth points to a disconnect between workforce expansion and employment generation.
- b. This raises concerns about the ability of the economy to convert growth into adequate employment opportunities.

Structural Causes of Employment Stress

1. Jobless Growth

- a. Economic growth has not translated into commensurate employment creation.
- b. A significant share of recent growth has occurred in sectors with relatively low labour absorption capacity.
- c. As a result, the pace of job creation has remained slower than workforce growth.

2. Slowdown in Globalisation

- a. Rising protectionism and slower global economic integration have weakened export-led employment opportunities.
- b. Limited participation in global value chains constrains large-scale job creation, particularly in labour-intensive industries.

3. Technological Transformation

- a. Artificial Intelligence (AI) and automation are reshaping labour markets across sectors.
- b. Routine and repetitive jobs face a higher risk of displacement.
- c. This is increasing the demand for digital, cognitive, and adaptable skill sets.

Challenges and Way Forward

Challenges	Way Forward
Job creation is insufficient to absorb the growing working-age population.	Promote labour-intensive sectors such as manufacturing, textiles, tourism, construction, and MSMEs.



Rising youth employment concerns and difficulties in labour market entry.	Expand vocational education, apprenticeships, internships, and industry-linked skilling programmes.
Persistently low female workforce participation.	Improve workplace safety, childcare support, flexible work arrangements, and women-centric skill development initiatives.
Mismatch between educational outcomes and labour market needs.	Align curricula with industry requirements and strengthen employability-focused training.
Economic growth has not generated adequate employment opportunities.	Integrate employment generation as a core objective of industrial and economic policy.
Weakening export-led employment prospects.	Enhance export competitiveness and deepen integration with global value chains.
Increasing impact of AI and automation on jobs.	Invest in reskilling, digital literacy, and future-ready workforce development.

Conclusion

India's employment trends reveal a persistent gap between economic growth and employment generation. Harnessing the demographic dividend will require a shift towards employment-intensive growth, stronger human capital development, higher female labour force participation, deeper integration with global markets, and continuous adaptation to technological change. Expanding productive and quality employment opportunities will be essential for achieving inclusive and sustainable economic development.

15. India's New Bilateral Investment Treaty (BIT) Framework

Context

India is revising its **Bilateral Investment Treaty (BIT)** framework to create a balanced investment regime that promotes foreign investment while safeguarding regulatory and fiscal sovereignty. The proposed framework is built around three key principles: a shorter domestic remedy requirement before arbitration, exclusion of the Most Favoured Nation (MFN) clause, and keeping taxation matters outside the ambit of investment treaties.

Bilateral Investment Treaty (BIT)

A **Bilateral Investment Treaty (BIT)** is an agreement between two countries that promotes and protects investments made by investors of one country in the territory of the other.

Objectives

1. Promote and facilitate foreign investment.
2. Ensure fair and equitable treatment of investors.
3. Protect investments against arbitrary actions and unlawful expropriation.
4. Provide a stable and predictable investment environment.
5. Establish mechanisms for resolving investment disputes.

Investor-State Dispute Settlement (ISDS)

ISDS is a dispute-resolution mechanism that allows foreign investors to directly initiate international arbitration against a host state for alleged violations of treaty obligations.

Importance

1. Provides an independent forum for resolving investment disputes.
2. Enhances investor confidence through legal protection.
3. Reduces uncertainty associated with cross-border investments.

Concerns

1. May constrain a state's regulatory and policy-making space.
2. Can expose governments to costly arbitration claims.
3. Raises concerns regarding regulatory and fiscal sovereignty.

Evolution of India's BIT Framework

1993 Model BIT

1. India signed BITs with several countries under the 1993 Model BIT.
2. The framework allowed foreign investors direct access to international arbitration.
3. It primarily emphasised investor protection.

Need for Reform

1. Arbitration disputes involving Vodafone and Cairn Energy raised concerns regarding India's fiscal and regulatory sovereignty.
2. These cases highlighted the need to balance investor protection with the state's policy autonomy.

2016 Model BIT

1. Required investors to first exhaust domestic remedies



- before approaching international arbitration.
- 2. Marked a shift towards balancing investor rights with sovereign regulatory interests.
- 3. Led to the renegotiation of several existing investment treaties.

Key Features of the Proposed BIT Framework

Reduced Domestic Remedy Requirement

Proposed Change

Reduction of the mandatory waiting period for exhausting domestic remedies from **five years to two years**, with flexibility in specific bilateral negotiations.

Significance

- 1. Makes the investment regime more investor-friendly.
- 2. Strengthens the role of domestic institutions.
- 3. Retains international arbitration as a mechanism of last resort.

Exclusion of the Most Favoured Nation (MFN) Clause

MFN Clause

The MFN clause requires a country to extend to one treaty partner any favourable treatment granted to another treaty partner.

Rationale for Exclusion

- 1. Enables country-specific investment arrangements.
- 2. Prevents automatic extension of concessions across treaties.
- 3. Provides greater flexibility in treaty negotiations.

Exclusion of Taxation Matters

Rationale

- 1. Tax disputes were a major source of investment arbitration claims against India.
- 2. Taxation is considered a core sovereign function of the state.

Significance

- 1. Protects fiscal sovereignty.
- 2. Limits arbitration arising from tax-related measures.
- 3. Preserves policy flexibility in taxation matters.

Debate on the Revised Framework

Concerns Raised

- 1. A two-year domestic remedy requirement may still exceed prevailing international practice.
- 2. Delayed access to arbitration could affect investor confidence.

- 3. Additional procedural requirements may reduce investment attractiveness.

Government's Perspective

- 1. Investor protection must be balanced with sovereign policy space.
- 2. FDI inflows depend on broader economic fundamentals, institutional quality, and ease of doing business.
- 3. The revised framework seeks to ensure both investment promotion and regulatory autonomy.

Global Trends in Investment Governance

- 1. Several countries are reassessing traditional **Investor-State Dispute Settlement (ISDS)** mechanisms.
- 2. Some countries are increasingly exploring alternatives such as **State-to-State Dispute Settlement (SSDS)** and other treaty-specific dispute-resolution mechanisms.
- 3. There is a growing emphasis on balancing investor protection with public policy and developmental objectives.

India's Recent Investment Agreements

Since the adoption of the 2016 Model BIT, India has concluded investment agreements with:

- 1. Belarus
- 2. Kyrgyz Republic
- 3. United Arab Emirates (UAE)
- 4. Uzbekistan

India has also entered into an investment arrangement with Taiwan through designated institutional channels.

These agreements reflect India's gradual transition towards a more balanced, flexible, and sovereignty-conscious investment treaty framework.

Significance of the Revised BIT Framework

- 1. Balances investor protection with regulatory and fiscal sovereignty.
- 2. Enhances legal certainty and predictability in the investment regime.
- 3. Supports stable and long-term foreign investment inflows.
- 4. Reduces exposure to costly international arbitration disputes.
- 5. Facilitates flexible and country-specific investment partnerships.
- 6. Strengthens India's credibility as a rules-based investment destination.



Conclusion

India's proposed BIT framework reflects an evolving approach to investment governance that seeks to balance investment facilitation with sovereign policy space. By recalibrating investor protections, refining dispute-resolution mechanisms, and providing greater flexibility in treaty design, the revised framework aims to create a stable, predictable, and mutually beneficial investment environment. Its long-term success will depend on maintaining investor confidence while preserving the state's ability to pursue legitimate economic, fiscal, and developmental objectives.

16. Farmer Producer Organisations (FPOs): Strengthening Agricultural Resilience

Context

With the IMD forecasting **below-normal monsoon rainfall in 2026**, the Ministry of Agriculture is leveraging **Farmer Producer Organisations (FPOs)** to promote water-efficient and drought-resilient farming practices.

Farmer Producer Organisations (FPOs)

FPOs are farmer-owned institutions that facilitate collective procurement, marketing, value addition, and access to credit, technology, and government support. They are particularly important as **small and marginal farmers constitute nearly 86% of India's operational landholders**.

Government Support

Formation and Promotion of 10,000 FPOs Scheme (2020)

1. Financial assistance of up to **₹18 lakh** over three years.
2. Equity grant of up to **₹15 lakh**.
3. Credit guarantee support of up to **₹2 crore**.
4. Implemented through NABARD, NCDC, SFAC, and State agencies.

Other Initiatives

1. Producer Organisation Development Fund (PODF).
2. Agricultural Infrastructure Fund (AIF).
3. SFAC support programmes.
4. Mission for Integrated Development of Horticulture (MIDH).

Current Status

1. Over **10,000 FPOs** have been formed.

2. More than **63 lakh farmers** are associated with them.
3. Active in agriculture, horticulture, dairy, fisheries, and beekeeping.

Role in Addressing Monsoon Variability

FPOs are promoting:

1. **Mulching** for soil moisture conservation.
2. **Drought-tolerant crops** such as millets and pulses.
3. **Mixed cropping** to reduce production risks.
4. **Drip irrigation** for efficient water use.
5. Training and awareness on sustainable farming practices.

Significance

1. Strengthens the economic position of small and marginal farmers.
2. Improves market access and price realisation.
3. Reduces dependence on intermediaries.
4. Encourages crop diversification and efficient resource use.
5. Facilitates delivery of government schemes and institutional support.

Challenges and Way Forward

Challenges	Way Forward
Limited managerial capacity	Strengthen training and professional support
Inadequate institutional finance	Expand affordable credit access
Weak market linkages	Improve integration with e-NAM and value chains
Fragmented landholdings	Promote greater farmer aggregation
Climate-related risks	Encourage climate-smart farming practices

Conclusion

FPOs have emerged as important institutions for improving farmer incomes, strengthening market access, and promoting sustainable agriculture. Their role in advancing climate-resilient farming will be critical for ensuring long-term agricultural stability.





SCIENCE AND TECHNOLOGY

1. ANCHOR: World's Most Detailed 3D Atlas of the Human Brainstem

Context

Recently, researchers at IIT Madras developed **ANCHOR**, a high-resolution 3D digital map of the human brainstem, providing an unprecedented view of its structure and supporting advanced neuroscience research.

About ANCHOR

1. **ANCHOR (Atlas of Neurochemical Characterization of the Human Brainstem with 3D Reconstruction)** is the world's most detailed 3D atlas of the human brainstem.
2. Developed by the **Sudha Gopalakrishnan Brain Centre (SGBC), IIT Madras**, it maps the brainstem across life stages, from the **prenatal period to adulthood**.
3. It employs a **multimodal approach**, integrating **MRI, histology, and neurochemical architecture**.
4. The atlas incorporates over **200 brainstem nuclei and fibre tracts**, reconstructed from hundreds of serial sections.
5. Its high-resolution reconstruction is based on **eight complementary immunostains** applied across more than **500 tissue sections**.
6. It enables examination of brain structures at the **micron level**, providing nearly **1,000-fold higher resolution than conventional MRI**.
7. It provides a high-resolution reference framework for understanding **brain development, neural connectivity, and cellular architecture**.
8. The atlas is expected to advance research on **neurological and neurodegenerative disorders**, supporting improved diagnosis and clinical investigations.

2. India's Semiconductor Industry: Strategic Imperatives

Context

A recent **NITI Aayog** report highlights the need for sustained investment, indigenous capabilities, and strategic partnerships to build a globally competitive semiconductor ecosystem in India.

About Semiconductors

1. **Semiconductors (chips)** are materials whose conductivity lies between conductors and insulators.
2. They are critical for **electronics, automobiles, telecommunications, defence systems, industrial automation, and healthcare devices**.

Semiconductor Value Chain

1. **Design** – Development of chip architecture and integrated circuits.
2. **Fabrication (Fab)** – Manufacturing chips on silicon wafers.
3. **ATMP** – Assembly, Testing, Marking, and Packaging.
4. **Fabrication** is the most capital-intensive and technologically advanced stage of the value chain.

India's Semiconductor Ecosystem

1. The **India Semiconductor Mission (ISM)** was launched with an outlay of **₹76,000 crore** to develop a domestic semiconductor ecosystem.
2. It supports:
 - a. Semiconductor and display fabrication units
 - b. Compound semiconductor facilities
 - c. Packaging and testing units
 - d. Chip design and innovation

Current Status

1. India's semiconductor manufacturing ecosystem remains at a **nascent stage**, with multiple fabrication, packaging, and testing projects currently under development.
2. **India's first semiconductor fabrication facility is under development at Dholera, Gujarat, and is expected to commence operations by 2028.**

Key Takeaways from the Report

1. Dependence on imported semiconductors poses risks to **national security, critical infrastructure, and supply-chain resilience**.
2. Developing a globally competitive semiconductor ecosystem requires long-term capital, technological capabilities, and skilled human resources.
3. India must strengthen capabilities in **R&D, chip design, intellectual property, materials science, and advanced manufacturing**.



4. Priority areas include:
 - a. Mature and strategically relevant technology nodes
 - b. Compound semiconductors
 - c. Packaging and testing
 - d. Indigenous innovation and design
5. Partnerships with the **United States, Japan, the European Union, and South Korea** can support technology access, research collaboration, and supply-chain security.

Challenges and Way Forward

Challenges	Way Forward
High capital requirements for fabrication facilities	Ensure sustained fiscal support and long-term investment
Dependence on foreign technology and intellectual property	Promote indigenous R&D and domestic IP creation
Shortage of specialised workforce	Expand semiconductor-focused skilling and industry-academia collaboration
Dependence on imported materials and components	Develop a domestic supplier ecosystem
Geopolitical and supply-chain disruptions	Diversify sourcing and strengthen partnerships with trusted countries
Infrastructure gaps for advanced manufacturing	Invest in semiconductor clusters and supporting infrastructure
Limited participation in advanced value-chain segments	Build capabilities in packaging, compound semiconductors, and niche semiconductor applications

Conclusion

A robust semiconductor ecosystem is essential for India's technological self-reliance, economic competitiveness, and strategic security. Sustained investment, indigenous innovation, skilled manpower, and strategic partnerships will be critical to strengthening India's position in the global semiconductor value chain.

3. Strengthening India's EV Supply Chains for Energy Security and Self-Reliance

Context

India's electric vehicle (EV) market is expanding rapidly, supported by policy measures such as subsidies, tax incentives, and registration benefits. However,

the increasing dependence on imported battery cells has emerged as a critical challenge for the long-term sustainability of the EV ecosystem and India's clean mobility ambitions.

Battery Import Dependence: A Strategic Concern

1. Lithium-ion batteries constitute the most critical and cost-intensive component of EVs. Despite policy initiatives to promote domestic manufacturing, India continues to rely heavily on imported battery cells and related technologies.
2. The rapid growth of electric mobility has therefore underscored the need to reduce reliance on external battery supply chains and strengthen domestic manufacturing capabilities.

Need for Resilient EV Supply Chains

1. Ensure uninterrupted availability of batteries and critical components.
2. Reduce exposure to external supply shocks and geopolitical uncertainties.
3. Strengthen energy security and strategic autonomy.
4. Support the objectives of Atmanirbhar Bharat and clean mobility.
5. Sustain long-term growth of the domestic EV industry.

Challenges and Way Forward

Challenges	Way Forward
Heavy dependence on imported battery cells and components	Expand domestic battery manufacturing capacity and local value addition
Concentrated supply chains	Diversify sourcing through a multi-country procurement strategy
Rising battery and logistics costs	Improve manufacturing efficiency and strengthen domestic supply networks
Limited access to critical minerals	Secure mineral supplies through international partnerships and overseas asset acquisition
Slow adoption of emerging battery technologies	Increase investment in R&D, innovation, and pilot projects
Technological gaps in domestic manufacturing	Promote technology transfer and industry-academia collaboration
Geopolitical and trade-related disruptions	Build resilient and diversified supply chains with strategic reserves



Conclusion

As India advances towards sustainable mobility, supply-chain resilience will be as important as market expansion. Building domestic manufacturing capabilities, securing critical minerals, diversifying sourcing networks, and investing in emerging technologies will be crucial for creating a secure, competitive, and self-reliant EV ecosystem.

4. GPS Aided GEO Augmented Navigation (GAGAN): India's Satellite-Based Navigation System for Civil Aviation

Context

A private jet was recently landed for the first time under the supervision of the Directorate General of Civil Aviation (DGCA) using the GPS Aided GEO Augmented Navigation (GAGAN) system, highlighting India's indigenous satellite-based navigation capability for civil aviation.

About GPS Aided GEO Augmented Navigation (GAGAN)

1. GPS Aided GEO Augmented Navigation (GAGAN) is India's Satellite-Based Augmentation System (SBAS), jointly developed by the **Airports Authority of India (AAI)** and the **Indian Space Research Organisation (ISRO)**.
2. It enhances the accuracy, integrity, and reliability of GPS signals, enabling safe and precise navigation for civil aviation.
3. Its primary objectives are to provide high-precision satellite navigation and improve air traffic management over Indian airspace.
4. GAGAN is interoperable with international SBAS networks, enabling seamless navigation across regional boundaries.
5. The system integrates ground and space segments to detect GPS signal errors, generate corrections, and transmit accurate navigation information to aircraft.

Ground Segment

1. **Indian Reference Stations (INRES)**: A network of 15 reference stations across India continuously monitors GPS signals and detects errors caused by ionospheric disturbances, satellite orbit variations, and clock inaccuracies.
2. **Indian Master Control Centre (INMCC)**: Processes data received from the reference stations and generates correction messages.

3. **Indian Land Uplink Station (INLUS)**: Transmits the correction messages to geostationary satellites for broadcasting to aircraft.

Space Segment

1. The space segment comprises GSAT-8 (2011), GSAT-10 (2012), and GSAT-15 (2015), each carrying dedicated GAGAN payloads.
2. These geostationary satellites broadcast the correction messages to GPS receivers on aircraft, enabling accurate and reliable navigation.

Importance

1. Enhances the accuracy and safety of aircraft navigation and precision landing.
2. Improves air traffic management and the efficient utilisation of Indian airspace.
3. Minimises navigation errors caused by atmospheric disturbances and satellite inaccuracies.
4. Ensures compatibility with global Satellite-Based Augmentation Systems (SBAS) for seamless cross-border navigation.
5. Strengthens India's indigenous satellite-based navigation capability and reduces dependence on foreign augmentation systems.

Conclusion

GAGAN is a significant achievement in India's aviation and space sectors. By integrating satellite technology with ground-based correction systems, it provides accurate and reliable navigation services, enhances aviation safety, and strengthens India's self-reliance in satellite-based air navigation.

5. Varya AI: India's Distilled Video Generation Model

Context

Recently, **Avataar.ai** launched **Varya AI**, a video-generation model developed to deliver cost-effective AI-powered video creation and support wider adoption of generative AI applications in India.

About Varya AI

1. **Varya AI** is a **distilled video-generation model** designed to make AI-powered video creation more affordable and accessible in India.
2. It has been developed with support from the **India AI Mission**.
3. The model uses **distillation**, a machine-learning technique in which a compact model learns from a



larger one, reducing video generation from nearly **50 processing steps to just 4** while maintaining comparable output quality.

4. It can generate videos at about **₹0.48 per second**, making it up to **10 times more cost-efficient** than several leading global models.
5. Users can create videos through **text prompts** or **image inputs** and extend them into longer video sequences.
6. Its applications span **education** (visual learning content), **MSMEs** (product advertising), and **governance** (video-based dissemination of public information).
7. By significantly lowering computational requirements, the model enables faster, scalable, and cost-effective video generation.

6. Shigellosis (Bacillary Dysentery): Causes, Transmission and Symptoms

Context

A recent increase in cases of **shigellosis (bacillary dysentery)** in **Keralam** has drawn attention to this highly infectious bacterial disease and its public health implications.

About Shigellosis (Bacillary Dysentery)

1. **Shigellosis** is a highly contagious diarrhoeal disease caused by **Shigella** bacteria.
2. It is one of the leading bacterial causes of diarrhoea worldwide.
3. **Humans are the only natural reservoir of Shigella.**
4. Although it can affect all age groups, **children under five years** are particularly vulnerable.
5. Severe disease is more common among young children, older adults, malnourished individuals, and people with weakened immunity.

Transmission

1. The disease spreads mainly through the **faecal-oral route**.
2. It can spread through direct contact with infected persons, contaminated food or water, contact with infected faecal matter, and certain forms of close personal or sexual contact.

Symptoms

1. The main symptom is **diarrhoea**, which may contain **blood or mucus** and can persist for several days.
2. Other symptoms include **abdominal cramps, fever, vomiting**, and a frequent urge to pass stools.

7. Blue Micromoon: A Rare Lunar Phenomenon

Context

A rare **Blue Micromoon** will occur this month, bringing together two uncommon lunar events—a **Blue Moon** and a **Micromoon**—in a single full moon occurrence.

Blue Moon

1. A **Blue Moon** refers to the **second full moon occurring within a calendar month**.
2. It occurs because the lunar cycle lasts about **29.5 days**, occasionally allowing two full moons in the same month.
3. A Blue Moon occurs roughly once every **33 months**.
4. The term “**Blue Moon**” is unrelated to the Moon’s actual colour.

Micromoon

1. A **Micromoon** occurs when a full moon coincides with the Moon’s **apogee**, the farthest point in its orbit from Earth.
2. The Moon follows an **elliptical orbit**, causing its distance from Earth to vary.
3. At **apogee**, the Moon is about **403,945 km** from Earth, while at **perigee** (the closest point), it is about **363,711 km** away.
4. A Micromoon appears about **6% smaller than an average full moon** and around **14% smaller than a Supermoon**.

Blue Micromoon

1. A **Blue Micromoon** occurs when a **Blue Moon** coincides with a **Micromoon**.
2. It is a relatively rare lunar event that generally occurs once every **few decades**, although the interval is not fixed.
3. The phenomenon can be observed with the **naked eye** under clear sky conditions.

8. Aurora Borealis: Causes and Occurrence

Context

The **Aurora Borealis**, also known as the **Northern Lights**, was recently expected to be visible from some parts of India due to increased activity on the Sun. This phenomenon is usually seen in areas located near the Earth’s North Pole.



About Aurora Borealis

1. It is a natural light phenomenon observed in the night sky of the northern hemisphere.
2. It is most commonly seen in high-latitude regions such as Norway, Sweden, Finland, Iceland, Canada, Alaska, and Greenland.
3. The corresponding phenomenon in the southern hemisphere is known as **Aurora Australis** or the **Southern Lights**.
4. Auroras originate from activity on the Sun, which continuously emits charged particles through the **solar wind**.
5. As these particles approach Earth, most are deflected by the planet's magnetic field, while some are guided towards the polar regions.
6. When these charged particles interact with gases in the upper atmosphere, they produce colourful displays of light.
7. Interactions with **oxygen** generally produce green light, whereas **nitrogen** gives rise to blue and purple hues.
8. Auroras are usually confined to regions near the poles due to the concentration of Earth's magnetic field lines in these areas.
9. During periods of intense solar activity, such as **solar flares** and **coronal mass ejections (CMEs)**, stronger solar winds can cause auroras to extend to lower latitudes.
10. Such events may also trigger **geomagnetic storms**, which are temporary disturbances in Earth's magnetic field.

9. Foraminifera and Marine Microbial Biodiversity

Context

Researchers at the **Agharkar Research Institute (ARI), Pune** have reported the discovery of a previously unknown species of **Foraminifera** and named it **Portatrochammina bharatensis**, highlighting ongoing efforts to document marine biodiversity and microscopic life forms.

About Foraminifera

1. **Foraminifera** are microscopic **single-celled marine organisms** that have inhabited Earth's oceans for over **500 million years**.
2. They are among the most abundant and ecologically significant organisms in marine ecosystems.
3. Most species possess protective shells, known as

tests, perforated by tiny openings called **foramina**.

4. Typically measuring **50–500 micrometres**, they are found in the **open ocean, coastal waters, and estuaries**.
5. Based on their habitat, they may occur as **planktonic forms** floating in the water column or **benthic forms** living on the seafloor.
6. Their shells range from simple single-chambered forms to complex multi-chambered structures and are often built from mineral particles gathered from their surroundings.
7. They move and capture food using **pseudopodia (false feet)** that extend through the openings in their shells.
8. The absence of a rigid cell wall enables them to change shape and move efficiently through their surroundings.
9. Their diet includes **organic detritus, bacteria, algae, diatoms, and small zooplankton** such as copepods.
10. Their abundance and long evolutionary history make them valuable indicators of **marine environments, oceanic changes, and past climatic conditions**.

10. AI Agent Security Framework: Managing Risks of Autonomous AI Systems

Context

Google DeepMind has introduced an **AI Agent Security Framework** through its **AI Control Roadmap** to address the security risks posed by autonomous AI agents. The framework argues that conventional AI alignment techniques alone are insufficient for the safe deployment of advanced AI systems.

AI Agents

1. AI agents are AI-powered software systems capable of **planning, reasoning and executing tasks autonomously** with minimal human intervention.
2. They interact with multiple tools and digital environments to perform complex tasks across sectors such as **software development, cybersecurity, scientific research and business operations**.

Rationale for the Framework

1. As AI agents gain greater autonomy and access to sensitive systems, the risks of unintended or harmful actions increase.
2. This necessitates a security framework that complements AI alignment with robust operational



safeguards throughout an AI system's lifecycle.

Defence-in-Depth Strategy

1. The framework adopts a **Defence-in-Depth** strategy by integrating multiple layers of **preventive, detective and corrective** security controls.
2. Instead of relying solely on model training, it seeks to identify, contain and mitigate risks throughout an AI agent's operation.

AI Agents as Potential Insider Threats

1. The framework treats highly autonomous AI agents as **potential insider threats**, recognising that privileged system access can amplify security risks if an agent behaves unexpectedly.
2. Accordingly, AI agents should operate under controlled permissions and continuous oversight, similar to privileged users in cybersecurity.

Key Risks

1. **Loss of Control:** AI agents operate beyond authorised oversight or initiate unauthorised deployments.
2. **Operational Sabotage:** AI agents compromise safety mechanisms or introduce vulnerabilities into critical systems.
3. **Direct Harm:** Misuse of privileged access leading to theft of sensitive information, destruction of data or other harmful actions.

Security Measures

1. **Graduated Permissions:** AI agents should receive system access progressively based on demonstrated reliability, following the **principle of least privilege**.
2. **Continuous Monitoring:**
 - a. Independent oversight systems should continuously evaluate an AI agent's decisions and actions.
 - b. Suspicious behaviour should trigger timely intervention before harmful actions are executed.

Future Challenges

1. **Limited Observability:** Advanced AI systems may conceal or obscure their internal reasoning, making effective oversight more difficult.
2. **Real-Time Risk Management:** High-risk scenarios require preventive intervention before harmful actions occur, rather than relying on post-incident correction.

Relevance for AI Governance

1. Strengthens AI risk management through continuous monitoring and layered security.
2. Promotes the safe deployment of autonomous AI

systems in critical sectors.

3. Supports the development of trustworthy, secure and accountable AI.
4. Encourages adaptive regulatory and technical safeguards as AI capabilities continue to evolve.

Conclusion

The AI Agent Security Framework represents a shift from **model-centric AI safety** to **lifecycle-based AI governance**. By integrating layered security, controlled access and continuous oversight, it seeks to ensure that increasingly autonomous AI systems remain secure, trustworthy and aligned with human objectives.

11. GRAPES-3 Telescope and Cosmic Ray Research

Context

Recently, findings from the GRAPES-3 telescope highlighted that changes in atmospheric conditions and solar magnetic activity can significantly influence the number of muons reaching the Earth's surface.

About GRAPES-3 Telescope

1. **GRAPES-3 (Gamma Ray Astronomy PeV EnergieS Phase-3)** is a cosmic ray observatory that studies the **origin, acceleration and propagation of cosmic rays** by measuring extensive air showers.
2. It investigates air showers generated when **high-energy cosmic rays or gamma rays** enter the Earth's atmosphere in the **TeV to PeV energy range**.
3. The facility also studies **solar activity and thunderstorm phenomena** using cosmic ray muons.
4. It employs an array of **plastic scintillator detectors** and a large-area **muon detector** based on proportional counters.
5. It is located in **Ooty, Tamil Nadu**, and is operated by the **Tata Institute of Fundamental Research (TIFR)**.

Cosmic Rays

1. **Cosmic rays** are among the most energetic particles in the universe and were discovered over a century ago.
2. They continuously bombard the Earth from outer space and arrive from nearly all directions.
3. Their interaction with the atmosphere produces **extensive air showers** comprising electrons, photons, muons, protons and neutrons, which travel towards the Earth's surface at speeds close to that of light.



4. Cosmic rays have been observed across a broad energy spectrum ranging from 10^8 to 10^{20} electronvolts (eV).

12. Murchison Widefield Array (MWA): Advancing Low-Frequency Radio Astronomy and Pulsar Discovery

Context

Astronomers have discovered a new millisecond pulsar using the Murchison Widefield Array (MWA) during the ongoing Southern-sky MWA Rapid Two-metre (SMART) survey, highlighting the telescope's role in advancing low-frequency radio astronomy.

About Murchison Widefield Array (MWA)

1. The **Murchison Widefield Array (MWA)** is a **low-frequency radio telescope** located at the **Murchison Radio-astronomy Observatory (MRO)** in Western Australia.
2. The observatory has also been selected to host **SKA-Low**, the low-frequency component of the **Square Kilometre Array (SKA)**.
3. The MWA is a collaborative project involving **20 research institutions** from **Australia, Canada, China, Japan, and the United States**, led by **Curtin University, Australia**.
4. It serves as a **precursor telescope** for **SKA-Low**, helping develop technologies and scientific methods for the larger observatory.
5. The telescope comprises **4,096 spider-like antennas** operating in the **70–300 MHz** frequency range.
6. Its **wide field of view, high angular resolution, nanosecond time resolution, and digital pointing capability** enable rapid sky mapping and the observation of faint and transient radio sources.

Key Research Areas

The MWA supports research in:

1. The **Epoch of Reionization**, when the first stars and galaxies formed.
2. The formation and evolution of **galaxies and galaxy clusters**.
3. **Solar activity and space weather**, including solar flares and coronal mass ejections.
4. **Transient radio phenomena**, including **pulsars** and **Fast Radio Bursts (FRBs)**.
5. The **interstellar medium** and **cosmic magnetic fields**.

Southern-sky MWA Rapid Two-metre (SMART)

Survey

1. **SMART** is an ongoing survey that uses the **MWA** to discover new **pulsars** in the **Southern Hemisphere**.
2. It is the **only low-frequency pulsar survey** operating in the Southern Hemisphere, observing in the **140–170 MHz** frequency band.
3. The survey is expected to discover **hundreds of new pulsars** and provide an important reference dataset for future pulsar searches using **SKA-Low**.

Pulsars

1. **Pulsars** are rapidly rotating **neutron stars** that emit beams of electromagnetic radiation at regular intervals ranging from **milliseconds to seconds**.
2. **Neutron stars** are extremely dense remnants of massive stars formed after **supernova explosions**.
3. Pulsars possess extremely strong **magnetic fields** that channel charged particles along their magnetic poles, producing beams of electromagnetic radiation.
4. Since the **magnetic axis** is usually inclined to the **rotation axis**, these beams sweep across space as the star rotates.
5. A pulse is detected whenever one of these beams crosses Earth's line of sight, producing a highly regular signal.
6. Pulsars are observed mainly at **radio wavelengths**.
7. Most known pulsars have a mass of about **1.35 times the Sun's mass**, with observed masses ranging from **1.18 to 1.97 solar masses**.

Square Kilometre Array (SKA)

1. The **Square Kilometre Array (SKA)** is an international project to build the **world's largest and most sensitive radio telescope**.
2. The **SKA Observatory** is an **intergovernmental organisation (IGO)** established to oversee the construction and operation of the project.
3. The telescope is being developed at two sites:
 - a. **SKA-Low** in **Australia**.
 - b. **SKA-Mid** in **South Africa**.
4. Its operational headquarters is located in the **United Kingdom**, and construction officially commenced on **5 December 2022**.
5. The telescope will comprise hundreds of antennas capable of generating unprecedented volumes of astronomical data.
6. It aims to answer fundamental questions about the **origin of the Universe**, the **formation and evolution of galaxies**, and the **search for the origins of life**.



7. **India became a member of the SKA Observatory in December 2022.**
8. Other member countries include **Australia, South Africa, the United Kingdom, Canada, China, France, Germany, Italy, Portugal, Spain, Sweden, Switzerland, and the Netherlands.**

Importance

1. Enhances understanding of the **early Universe** and fundamental astrophysical processes.
2. Improves the discovery and study of **pulsars, Fast Radio Bursts (FRBs)**, and other transient radio sources.
3. Strengthens international collaboration in radio astronomy.
4. Serves as a technological and scientific precursor to next-generation observatories such as the **Square Kilometre Array (SKA)**.

Conclusion

The discovery of a new millisecond pulsar through the **SMART Survey** highlights the growing capabilities of low-frequency radio astronomy. Together with next-generation facilities such as the **Square Kilometre Array**, it is expected to deepen our understanding of the early Universe, extreme astrophysical objects, and the formation and evolution of galaxies.

13. National Internet Exchange of India (NIXI): Strengthening India's Digital Infrastructure

Context

The National Internet Exchange of India (NIXI), the organisation responsible for facilitating domestic internet traffic exchange and managing India's country-code domains, recently celebrated its 23rd Foundation Day on June 19.

About National Internet Exchange of India (NIXI)

1. NIXI is a not-for-profit organisation under the **Ministry of Electronics and Information Technology (MeitY)**, incorporated as a **Section 8 company** under the Companies Act, 2013.
2. It was established to promote internet penetration and strengthen India's digital infrastructure.
3. Its primary objective is to facilitate the exchange of domestic internet traffic among Internet Service Providers (ISPs), content providers, and other entities possessing Autonomous System (AS) numbers.

4. NIXI manages India's country-code top-level domains **".IN"** and **".Bharat"**, thereby supporting the country's digital identity and online presence.
5. Through the **Indian Registry for Internet Names and Numbers (IRINN)**, it allocates and manages **IPv4 and IPv6 addresses** in India.
6. It operates **79 Internet Exchange Points (IXPs)** across the country, enabling efficient routing of domestic internet traffic and reducing latency.
7. NIXI supports domain name registration in **22 Indian languages**, promoting multilingual access to digital services.
8. Through these initiatives, it contributes to a secure, resilient, and inclusive internet ecosystem aligned with India's digital transformation objectives.

14. SOLAR-1: Space Weather Monitoring Satellite

Context

The United States has activated **SOLAR-1 (Space Weather Observations at L1 to Advance Readiness-1)**, its **first dedicated space weather monitoring satellite**, to provide early warnings of solar storms and improve protection of satellites, communication networks, navigation systems, and power grids from space weather disturbances.

About SOLAR-1

1. It is operated by the **National Oceanic and Atmospheric Administration (NOAA)** and was earlier known as **Space Weather Follow-On-Lagrange 1 (SWFO-L1)**.
2. It was launched on **24th September 2025** using a **SpaceX Falcon 9** rocket.
3. The spacecraft is positioned at the **Sun-Earth Lagrange Point 1 (L1)**, about **1.6 million km from Earth towards the Sun**.
4. This gravitationally stable location provides a continuous and unobstructed view of solar activity.
5. It monitors **solar wind** and tracks **Coronal Mass Ejections (CMEs)** before they reach Earth.
6. It carries a **compact coronagraph** and other instruments for real-time observation of the Sun and space weather conditions.
7. It can transmit CME images and data to NOAA's Space Weather Prediction Center within about **30 minutes**, enabling faster warnings.
8. The mission is expected to improve space weather



forecasts and strengthen the protection of **satellites, communication systems, navigation networks, power grids, and space missions** from solar storms.

15. Bolides and Meteors: Understanding Atmospheric Entry of Space Objects

Context

A possible **bolide** event was reported recently after residents of Boston heard loud boom-like sounds and explosions, which experts believe may have resulted from a large meteor entering the Earth's atmosphere.

About Bolide

1. A bolide is an exceptionally bright meteor that often explodes or breaks apart in the Earth's upper atmosphere, producing a brilliant flash of light.
2. Larger bolides may generate loud sonic booms, and some fragments can survive atmospheric entry and reach the ground as meteorites.
3. Bolide events occur several times each year, although many go unnoticed because they take place over remote or sparsely populated regions.
4. The study of bolides helps scientists understand the composition of meteoroids and the processes involved during atmospheric entry.

Meteoroid, Meteor and Meteorite

1. A rocky object travelling through space is known as a meteoroid.
2. When a meteoroid enters the Earth's atmosphere and burns due to friction, it is called a meteor, commonly seen as a "shooting star."
3. If a part of the object survives its passage through the atmosphere and reaches the Earth's surface, it is known as a meteorite.

16. Export Controls on Anthropic's Advanced AI Models

Context

The United States has imposed export restrictions on **Fable 5** and **Mythos 5**, the latest artificial intelligence models developed by Anthropic. The order prohibits access by foreign nationals, including employees of the company, citing national security concerns. The move reflects a growing trend of treating advanced AI systems as strategic technologies with significant security implications.

Export Controls and Their Expanding Scope

Export controls are regulatory measures used to restrict

the transfer of sensitive goods, technologies, or services that may affect national security.

Traditionally, such controls have been applied to:

1. Advanced semiconductor chips.
2. Defence and military technologies.
3. Dual-use technologies with both civilian and strategic applications.

The current order marks a significant shift, as it extends export controls to access and use of advanced AI models, signalling the emergence of AI as a regulated strategic asset.

Key Features of the Order

1. Access to **Fable 5** and **Mythos 5** is restricted to authorised American users.
2. Foreign nationals are barred from using the models irrespective of their location.
3. The restrictions extend to Anthropic's foreign employees.
4. The decision is linked to concerns regarding the potential misuse of advanced AI capabilities, particularly in cybersecurity-related applications.

Fable 5 and Mythos 5

Fable 5 and Mythos 5 are Anthropic's most advanced publicly available AI models, built on the company's **Mythos-class architecture**.

Key Capabilities

1. Advanced reasoning and analytical abilities.
2. Sophisticated coding assistance.
3. Detection of software vulnerabilities.
4. Enhanced problem-solving capabilities.

Origin and Safety Concerns

The models are derived from **Mythos Preview**, an experimental system that was not publicly released.

Anthropic reportedly withheld its release due to concerns that its advanced vulnerability-detection capabilities could be misused against critical digital infrastructure and software systems.

Safety Safeguards

To minimise risks, the new models incorporate:

1. Restrictions on sensitive cybersecurity-related queries.
2. Filters for potentially harmful requests.
3. Redirection of high-risk prompts to less capable AI systems.
4. Enhanced monitoring mechanisms to prevent misuse.



Significance

AI as a Strategic Technology

- The decision highlights the growing perception of advanced AI as a strategic asset comparable to:
 - Advanced semiconductors.
 - Cyber capabilities.
 - Defence-related technologies.
- It reflects the increasing **securitisation of artificial intelligence** in international relations and signals a shift towards tighter regulation of frontier AI systems.
- It also indicates a transition from regulating AI hardware to governing access to advanced AI capabilities.

Implications for India

The episode highlights the strategic importance of building a resilient domestic AI ecosystem and reducing dependence on external technological platforms.

It underscores the need to:

- Strengthen indigenous AI research and development.
- Expand high-performance computing infrastructure.
- Build a resilient semiconductor ecosystem.
- Reduce dependence on foreign AI technologies.
- Promote public-private collaboration in frontier technologies.
- Establish robust frameworks for safe and responsible AI deployment.
- Enhance India's role in shaping global AI governance discussions.

Challenges and Way Forward

Challenges	Way Forward
Technological concentration and unequal access to frontier AI systems.	Promote indigenous AI innovation and strengthen technological self-reliance.
Absence of globally accepted norms for governing advanced AI models.	Develop multilateral frameworks for responsible AI governance and cooperation.
Potential misuse of AI for cyberattacks and critical infrastructure disruption.	Establish robust AI safety standards, monitoring systems, and cybersecurity safeguards.
Dependence on foreign AI models, computing infrastructure, and semiconductor supply chains.	Invest in domestic AI ecosystems, high-performance computing facilities, and semiconductor manufacturing.
Balancing technological innovation with security concerns.	Adopt a risk-based regulatory framework that encourages innovation while ensuring accountability and safety.

Conclusion

The restrictions on Anthropic's AI models highlight the emergence of artificial intelligence as a strategic technology with significant national security implications. For India, the episode underscores the importance of technological self-reliance, robust AI governance, and sustained investment in frontier technologies to secure long-term strategic and economic competitiveness.





GEOGRAPHY AND ENVIRONMENT

1. Climate Change and Rising Cost of Living

Context

Recent assessments, including those by the **World Bank**, indicate that climate change is increasingly influencing living costs in India. Rising temperatures, changing monsoon patterns, and extreme weather events are affecting food prices, energy demand, water availability, and healthcare expenditure. Consequently, climate change is emerging as a significant economic and social challenge alongside its environmental implications.

Channels Through Which Climate Change Raises Living Costs

Climate change affects household welfare by disrupting the availability and affordability of essential goods and services. Its impacts are transmitted through food inflation, higher energy consumption, water insecurity, and rising healthcare expenditure, placing sustained pressure on household budgets.

Impact on Food Security and Inflation

Agriculture remains highly vulnerable to climatic variability. Heatwaves, droughts, floods, and erratic rainfall can reduce crop productivity, disrupt supply chains, and create market uncertainties. These disruptions often lead to food shortages, price volatility, and inflation. Given the substantial share of food in household expenditure, climate-induced shocks can significantly increase living costs, particularly for vulnerable households.

Impact on Energy Expenditure

Rising temperatures have increased the demand for cooling and electricity. Higher energy consumption places pressure on power infrastructure and raises generation costs, which may eventually be reflected in increased electricity tariffs. For economically weaker households, rising energy bills can reduce spending on other essential needs and further aggravate financial stress.

Impact on Water Security

Changing rainfall patterns and declining groundwater reserves are making access to water more uncertain and costly. Rural households often incur additional expenditure in securing water, while urban areas increasingly rely on private and alternative water supply systems. Consequently, water scarcity is emerging as a

significant driver of household expenditure and livelihood vulnerability.

Impact on Health and Healthcare Costs

Climate change is associated with heat stress, deteriorating air quality, and the spread of climate-sensitive diseases. These factors increase healthcare expenditure, reduce labour productivity, and adversely affect household incomes. Vulnerable groups, including women, children, the elderly, and economically weaker sections, are particularly exposed to these risks.

Climate Change and Social Inequality

The burden of climate change is distributed unevenly across society. Marginalised communities, small and marginal farmers, and low-income households often possess limited adaptive capacity and reduced access to climate-resilient technologies and infrastructure. Consequently, climate change can deepen existing socio-economic inequalities and undermine livelihood security.

Economic Implications for India

Climate-related disruptions can generate broader macroeconomic consequences, including:

1. Higher inflationary pressures
2. Reduced agricultural productivity
3. Rising healthcare expenditure
4. Increased rural distress and livelihood insecurity
5. Higher public expenditure on disaster management and climate adaptation
6. Slower economic growth

According to the **World Bank**, rising temperatures and changing monsoon patterns could reduce India's GDP by up to **2.8% by 2050**, underscoring the long-term developmental risks posed by climate change.

Way Forward

1. Promote climate-resilient agriculture and sustainable farming practices.
2. Strengthen urban heat action plans and disaster preparedness systems.
3. Improve water conservation, watershed management, and groundwater recharge.
4. Expand affordable healthcare and social protection mechanisms.



- Invest in climate-resilient infrastructure and public services.
- Enhance adaptive capacity through technological innovation, skill development, and community participation.
- Mainstream climate resilience into economic planning and development strategies.

Conclusion

Climate change is increasingly emerging as a **cost-of-living, development, and governance challenge**. Addressing its impacts requires integrating climate resilience into economic planning, strengthening adaptive infrastructure, and expanding social protection systems. Such measures will be critical for safeguarding livelihoods, reducing vulnerabilities, and ensuring sustainable, inclusive, and resilient development.

2. Europe's Heatwave Crisis

Context

Western Europe is experiencing an intense heatwave, affecting countries such as the **Netherlands, the United Kingdom, France, and Italy**. The extreme temperatures have caused fatalities, disrupted essential services, and highlighted Europe's increasing vulnerability to climate-induced extreme weather events.

Omega Block (Heat Dome)

The immediate trigger for the heatwave is an **Omega Block**, a persistent atmospheric circulation pattern resembling the Greek letter Ω .

Under normal conditions, **jet streams** move weather systems across Europe. When the jet stream develops large meanders, a strong **high-pressure system** becomes trapped between two low-pressure systems, forming an Omega-shaped pattern. This creates a **heat dome** that traps warm air near the Earth's surface, resulting in:

- Persistent sunshine due to suppressed cloud formation.
- Reduced rainfall.
- Rising temperatures due to the compression of sinking air.
- Prolonged periods of extreme heat.

Drivers of Rapid Warming in Europe

According to recent climate assessments, **Europe is the fastest-warming continent** due to a combination of natural and human-induced factors:

- Urban Heat Island Effect:** Extensive concrete and asphalt surfaces absorb and retain more heat than natural landscapes.

- Declining Arctic Albedo:** Melting Arctic ice exposes darker ocean surfaces that absorb more solar radiation, accelerating regional warming.
- Fossil Fuel Dependence:** Continued extraction and use of fossil fuels have increased greenhouse gas emissions, intensifying global warming.

Factors Increasing Europe's Vulnerability

Europe is particularly vulnerable to extreme heat because much of its infrastructure and demographic profile evolved for a colder climate.

- Cold-climate infrastructure:** Buildings designed to retain heat and the relatively limited use of air conditioning increase indoor temperatures during heatwaves.
- Longer daylight hours:** Extended summer daylight prolongs solar heating and reduces night-time cooling.
- Ageing population:** A large elderly population is more susceptible to heat-related illnesses and mortality.
- Adaptation gap:** Although heat action plans and early-warning systems have improved since the 2003 European heatwave, adaptation efforts have not kept pace with the increasing frequency and intensity of heatwaves.

Implications

Prolonged heatwaves can lead to:

- Increased heat-related illnesses and mortality.
- Disruptions to healthcare, transport, education, and other public services.
- Higher energy demand for cooling, increasing pressure on electricity infrastructure.
- Greater risks of droughts, wildfires, and water scarcity.

Way Forward

Building resilience to extreme heat requires:

- Strengthening heat action plans and early-warning systems.
- Promoting climate-responsive urban planning through green spaces and cool-roof technologies.
- Protecting vulnerable populations, particularly the elderly.
- Accelerating the transition to clean energy and reducing greenhouse gas emissions.
- Investing in climate-resilient infrastructure and strengthening adaptation capacity.

Conclusion

Europe's recurring heatwaves demonstrate that climate



change is increasing not only average temperatures but also the frequency and intensity of extreme weather events. Strengthening climate-resilient infrastructure, sustainable urban planning, and effective adaptation measures will be essential to reducing future climate risks while safeguarding public health, economic resilience, and environmental sustainability.

3. Weak Monsoon in India

Context

The Government of India has formulated contingency plans for over **300 vulnerable districts** as a **weak southwest monsoon**, coupled with emerging **El Niño** conditions, threatens agriculture, water security, and rural livelihoods.

Significance of the Southwest Monsoon

The southwest monsoon contributes nearly **70–75% of India's annual rainfall** during the June–September season and is crucial for:

1. Kharif crop cultivation.
2. Groundwater recharge and reservoir replenishment.
3. Hydropower generation and drinking water supply.
4. Rural livelihoods and overall economic growth.

As nearly half of India's cultivated land remains rain-fed, deficient or delayed monsoon rainfall can significantly reduce agricultural production and farm incomes.

The **India Meteorological Department (IMD)** defines normal monsoon rainfall as **96–104% of the Long Period Average (87 cm)**. For **2026**, it has projected rainfall at around **90% of the LPA**, indicating a below-normal southwest monsoon.

Current Monsoon Conditions

The ongoing monsoon season has been marked by:

1. A significant rainfall deficit, particularly during June.
2. Delayed advance of the southwest monsoon.
3. Uneven spatial distribution of rainfall, affecting **kharif sowing**.

These conditions may adversely affect agricultural productivity even if rainfall improves later in the season.

Factors Behind the Weak Monsoon

The present rainfall deficit has primarily resulted from:

1. Weak low-pressure systems.
2. Reduced strength of monsoon currents.
3. An unfavourable phase of the **Madden–Julian Oscillation (MJO)**, which influences tropical rainfall patterns.

Although **El Niño** has developed over the equatorial Pacific Ocean, its influence on the Indian monsoon is expected to strengthen as the season progresses.

Government Response

The Government has prepared contingency plans for **315 vulnerable districts**, including **111 high-priority** and **76 medium-priority** districts, with emphasis on:

1. Promoting **short-duration and less water-intensive crops**, such as pulses, millets, and oilseeds.
2. Strengthening ponds, check dams, rainwater harvesting structures, and other local water conservation systems.
3. Conserving soil moisture to support agriculture during prolonged dry spells.

Factors Enhancing India's Resilience

India is better positioned to manage a weak monsoon due to:

1. Improved reservoir storage and groundwater availability.
2. Expansion of watershed development and rainwater harvesting.
3. Growing use of solar and wind energy, reducing dependence on hydropower and conserving reservoir water for irrigation and drinking purposes.
4. Improved weather forecasting and wider adoption of climate-resilient farming practices.

Likely Impacts

A prolonged weak monsoon can:

1. Reduce production of major **kharif crops**, including rice, maize, soybean, cotton, and sugarcane.
2. Lower farm incomes and weaken rural demand.
3. Increase food inflation.
4. Intensify water stress in rain-fed and drought-prone regions.
5. Moderate overall economic growth.

Way Forward

Strengthening long-term resilience requires:

1. Crop diversification and promotion of drought-resistant crop varieties.
2. Expansion of irrigation and efficient water-use technologies.
3. Integrated watershed management and rainwater harvesting.
4. Strengthening weather forecasting, early warning systems, and decentralised contingency planning.

Conclusion



The increasing variability of the southwest monsoon shows that the challenge extends beyond the quantity of rainfall to its **timing, spatial distribution, and intensity**. Strengthening climate-resilient agriculture, sustainable water management, and adaptive planning will be essential to ensuring food security, protecting rural livelihoods, supporting sustainable agricultural growth, and promoting long-term economic resilience.

4. Western Ghats Ecologically Sensitive Area (ESA)

Context

The Western Ghats Ecologically Sensitive Area (ESA) proposal has once again come under discussion as differences persist between the Centre and the six Western Ghats states over the finalisation of ESA boundaries. With the current notification valid until July 2026, efforts are ongoing to achieve a consensus that balances ecological conservation with developmental and livelihood concerns.

Significance of the Western Ghats

1. The **Western Ghats** are a mountain chain extending about **1,500 km** along India's western coast.
2. They are recognised as one of the world's **eight biodiversity hotspots** and harbour a large number of endemic plant and animal species.
3. The Ghats act as a major climatic barrier influencing the **southwest monsoon** and serve as the source of major rivers such as the **Godavari, Krishna, Cauvery, and Periyar**.
4. Spread across **Gujarat, Maharashtra, Goa, Karnataka, Kerala, and Tamil Nadu**, the region supports agriculture, plantations, and the livelihoods of millions of people.
5. Owing to their exceptional ecological value, the Western Ghats were inscribed as a **UNESCO World Heritage Site in 2012**.

Ecologically Sensitive Area (ESA)

1. An **Ecologically Sensitive Area (ESA)** is notified under the **Environment (Protection) Act, 1986** to protect ecologically fragile regions.
2. ESAs seek to minimise ecological degradation by regulating activities that may adversely affect biodiversity and ecosystem stability.
3. Activities such as **mining, quarrying, thermal power projects, highly polluting industries, and large-scale construction** are either prohibited or subject to strict regulation.

Gadgil Committee (2011)

1. The **Western Ghats Ecology Expert Panel (WGEEP)**, chaired by **Madhav Gadgil**, recommended ESA status for the entire **1,29,037 sq km** Western Ghats region.
2. It advocated a conservation-centric approach with stringent restrictions on developmental activities.
3. The recommendations faced opposition owing to concerns regarding their impact on livelihoods and economic activities.

Kasturirangan Committee (2013)

1. The committee headed by **K. Kasturirangan** proposed a more balanced approach towards conservation.
2. It classified the Western Ghats into **natural landscapes** and **human-use landscapes**.
3. Out of the total **1,64,280 sq km** area, nearly **60,000 sq km** of ecologically significant natural landscapes were recommended for ESA status.
4. Areas with significant human presence, including settlements, farmlands, and plantations, were largely kept outside the proposed ESA zone.
5. The recommendations sought to balance environmental protection with livelihood and developmental needs.

Evolution of the ESA Proposal

1. The first draft ESA notification was issued in **2014** based on the Kasturirangan Committee's recommendations.
2. The proposed ESA area was reduced to approximately **56,826 sq km**.
3. Persistent differences between the Centre and the states have delayed finalisation of ESA boundaries for more than a decade.
4. The latest notification, issued in **July 2024**, remains valid until **July 2026**.
5. It introduced a **state-wise implementation mechanism**, enabling progress in states where consensus has been achieved.

Challenges in ESA Implementation

1. Several states have raised concerns regarding restrictions on mining, quarrying, industries, infrastructure projects, and construction activities.
2. **Karnataka** has strongly opposed the proposed demarcation, while **Kerala** and **Maharashtra** have sought exclusion of certain villages and plantation areas.
3. Concerns primarily relate to livelihood security, plantation-based economies, and infrastructure development.



Sanjay Kumar Committee (2022)

1. The Centre constituted an expert committee under **Sanjay Kumar**, former Director General of Forests, to examine state-level objections to the ESA proposal.
2. The committee is reviewing village records, satellite imagery, and field-level data to facilitate consensus on ESA boundaries.

Payment for Ecosystem Services (PES)

1. **Payment for Ecosystem Services (PES)** is a proposed mechanism to compensate states for conserving ecologically important regions.
2. It recognises ecosystem benefits such as **water security, carbon sequestration, climate regulation, and biodiversity conservation**.
3. The mechanism is being explored to support long-term conservation efforts while addressing developmental concerns.

Way Forward

1. ESA boundaries should be finalised through scientific assessment, reliable ground-level data, and stakeholder consultation.
2. Financial mechanisms such as **Payment for Ecosystem Services (PES)** can encourage states to undertake conservation measures.
3. Greater cooperation among the Centre, states, and local communities is essential for effective implementation.
4. Conservation measures should be aligned with local livelihood requirements to ensure sustainable and inclusive development.

Conclusion

The Western Ghats ESA issue highlights the challenge of balancing ecological conservation with developmental needs. A science-based, participatory, and sustainable approach is essential for protecting this ecologically significant region while ensuring the well-being of local communities.

5. Seismic Doublet: Understanding Twin Earthquakes and Their Destructive Potential

Context

Venezuela was recently struck by two powerful earthquakes within **39 seconds**, a rare seismic phenomenon known as a **seismic doublet**. Measuring **7.2** and **7.5** in magnitude, the earthquakes are estimated by the **US Geological Survey (USGS)** to be among the country's deadliest natural disasters.

Earthquake Sequence

1. A **7.2-magnitude foreshock** occurred near **San Felipe** in **Yaracuy State**, about **160 km west of Caracas**.
2. Within **39 seconds**, a **7.5-magnitude mainshock** struck near **Moron** in **Carabobo State**.
3. The second earthquake was the strongest recorded in Venezuela since **1900**.
4. According to the **USGS**, the event resulted from the interaction of closely related fault ruptures, giving rise to a **seismic doublet**.

Seismic Doublet

A **seismic doublet** is a sequence of **two earthquakes of nearly equal magnitude** that occur within a short time interval and close geographical proximity due to separate but closely linked fault ruptures. Unlike a typical earthquake sequence, neither event is simply an aftershock of the other.

Difference Between Seismic Doublets and Aftershocks

Seismic Doublet	Aftershocks
Comprises two independent earthquakes of comparable magnitude.	Consists of smaller earthquakes following a mainshock.
Caused by separate but closely connected fault ruptures.	Caused by stress redistribution after the main earthquake.
Occurs within seconds, minutes or a few hours.	May continue for days, months or even years.
Produces repeated high-intensity shaking, increasing damage.	Generally, decline in frequency and magnitude over time.

Factors Contributing to High Destructiveness

1. **Shallow Focus**
 - a. The earthquakes originated at a depth of about **10 km**, allowing seismic energy to reach the Earth's surface with minimal loss.
 - b. This generates intense surface shaking, resulting in severe damage to buildings and infrastructure.
2. **Consecutive Major Earthquakes**
 - a. Two strong earthquakes occurring within seconds significantly prolong the duration of severe ground motion.
 - b. Structures weakened by the first event are immediately exposed to another powerful shock, increasing the risk of collapse, casualties and disruption of rescue operations.

Seismic Vulnerability of Venezuela

1. Venezuela lies along the **Caribbean Plate–South American Plate** boundary, one of the most active



tectonic regions in northern South America.

2. Earthquakes in the region mainly occur due to **strike-slip faulting**, where tectonic plates slide horizontally past one another.
3. The recent earthquakes were triggered by **shallow strike-slip movement** along this active plate boundary.

Major Types of Faults

1. **Normal Fault:** Formed by extensional forces, causing the hanging wall to move downward.
2. **Reverse Fault:** Formed by compressional forces, causing the hanging wall to move upward.
3. **Strike-slip Fault:** Formed by horizontal displacement of rock masses along the fault plane.

Seismic History of Venezuela

1. Venezuela has recorded nearly **1,000 earthquakes of magnitude 4.0 or above** over the past decade.
2. Before the 2026 event, the **1900 San Narciso earthquake (M 7.7)** was the country's strongest recorded earthquake.
3. Although Venezuela lies outside the **Pacific Ring of Fire**, its location along an active tectonic boundary makes it highly susceptible to earthquakes.

Significance

1. Highlights the exceptional destructive potential of **seismic doublets**.
2. Improves understanding of earthquake generation and **fault interactions**.
3. Strengthens scientific assessment of seismic hazards and disaster risk.
4. Reinforces the importance of resilient infrastructure, early warning systems and disaster preparedness.

Conclusion

The Venezuela seismic doublet demonstrates how complex tectonic processes can intensify earthquake impacts. Strengthening seismic monitoring, promoting earthquake-resistant infrastructure and integrating disaster risk reduction into development planning are essential to reducing the human and economic costs of future seismic events.

6. Non-Methane Hydrocarbons (NMHCs): Role in Air Quality and Ozone Formation

Context

A study conducted by the **Aryabhata Research Institute**

of Observational Sciences (ARIES) monitored **non-methane hydrocarbons (NMHCs)** in **Munsyari, Uttarakhand**, between **2022 and 2023** to assess their sources, seasonal variations, and implications for regional air quality and atmospheric chemistry.

About Non-Methane Hydrocarbons (NMHCs)

1. **Non-Methane Hydrocarbons (NMHCs)** are trace atmospheric hydrocarbons, excluding methane, and include compounds such as **ethane, ethene, propane, propene, and isoprene**.
2. They are emitted from both **natural and anthropogenic sources**, including vegetation, fuel combustion, vehicular emissions, industrial activities, and biomass burning.
3. Terrestrial ecosystems constitute the primary source of NMHCs, while marine environments contribute to a lesser extent. Their emissions vary according to climatic and environmental conditions.
4. NMHCs are highly reactive **volatile organic compounds (VOCs)** that participate in atmospheric chemical processes and influence the concentration of **hydroxyl radicals (OH)**, which play a crucial role in the atmosphere's self-cleansing capacity.
5. They act as important precursors for the formation of **tropospheric ozone** and **secondary organic aerosols (SOA)**, thereby influencing air quality, atmospheric composition, and climate-related processes.
6. Elevated NMHC concentrations can contribute to air pollution by increasing ozone and aerosol levels, with potential adverse effects on human health, ecosystems, and visibility.
7. Monitoring NMHCs is important for identifying pollution sources, understanding regional atmospheric dynamics, and supporting effective air-quality management and pollution-control strategies.

7. Joint Crediting Mechanism (JCM) under the Paris Agreement

Context

Recently, India and Japan agreed on the implementation framework for the Joint Crediting Mechanism (JCM), marking a step forward in bilateral cooperation on climate mitigation and carbon market mechanisms under the Paris Agreement.

About Joint Crediting Mechanism (JCM)

1. The **Joint Crediting Mechanism (JCM)** is a bilateral climate cooperation framework proposed by **Japan** and launched in **2013**.



2. It aims to promote the deployment of **advanced decarbonisation technologies and infrastructure** in partner countries through investments by Japanese entities.
3. The mechanism is implemented under **Article 6 of the Paris Agreement** and operates within the framework of the **United Nations Framework Convention on Climate Change (UNFCCC)**.
4. It supports the achievement of participating countries' **Nationally Determined Contributions (NDCs)** by quantifying emission reductions and facilitating the sharing of resulting carbon credits.
5. It complements existing international mechanisms such as the **Clean Development Mechanism (CDM)** and **Joint Implementation (JI)**.
6. **India is among the 31 partner countries** participating in the mechanism.
7. It promotes **sustainable development** in partner countries through technology transfer and climate-friendly investments.
8. Priority sectors under the mechanism include **renewable energy with storage, sustainable aviation fuel, compressed biogas, green hydrogen, green ammonia, and other hard-to-abate sectors**.

8. Electrification: Key to the Energy Transition

Context

At the Bonn Climate Conference, Turkey proposed a global target of meeting at least **35% of total energy demand through electricity by 2035**, highlighting the critical role of electrification in achieving global climate objectives.

Understanding Electrification

Electrification refers to the **replacement of direct fossil-fuel use with electricity** across sectors such as transport, industry, cooking, and heating.

It is central to the energy transition because most low-carbon energy sources, including solar, wind, hydropower, and nuclear power, generate electricity. Therefore, deep decarbonisation depends on both expanding clean electricity generation and increasing its use across end-use sectors.

Current Status

According to the **International Energy Agency (IEA)**:

1. Electricity accounted for about **21% of global Total Final Energy Consumption (TFEC)** in 2025.

2. India's share stood at approximately **23%**, indicating significant scope for further electrification.
3. Despite substantial growth in electricity generation, its share in overall final energy consumption has increased only gradually.

Challenges to Electrification

Electrification remains uneven across sectors due to technological, infrastructural, and economic constraints.

1. Aviation and shipping
2. Heavy-duty and long-haul transport
3. Iron and steel production
4. Cement manufacturing
5. Glass and ceramics industries
6. Certain heating applications

These sectors often require high-temperature processes or energy-dense fuels for which commercially viable electric alternatives are still limited.

The Clean Electricity Challenge

Electrification alone cannot deliver meaningful emission reductions unless electricity is generated from clean sources.

1. Around **42% of global electricity generation in 2025** came from non-fossil-fuel sources such as renewables, hydropower, and nuclear energy.
2. Consequently, fossil fuels continue to dominate global energy consumption.

This demonstrates that expanding electricity use alone is insufficient unless accompanied by a rapid increase in clean power generation.

Turkey's Proposal

Turkey has proposed raising the global share of electricity in final energy consumption to **35% by 2035**, based on a roadmap developed by the **International Renewable Energy Agency (IRENA)**.

According to IRENA, this level of electrification is necessary to keep the world on a pathway consistent with limiting global warming to **1.5°C** under the Paris Agreement.

The proposal is expected to be discussed further at **COP31**.

Requirements for Achieving the Target

Achieving the proposed target will require:

1. Increased investment in electricity infrastructure.
2. Rapid expansion of renewable energy capacity.
3. Large-scale deployment of battery storage systems.
4. Modernisation of transmission and distribution



networks.

- Greater electrification of transport and industrial sectors.

Progress may be affected by geopolitical tensions, supply-chain disruptions, energy-security concerns, and financing constraints.

Implications for India

Accelerated electrification can strengthen India's energy security, reduce dependence on imported fossil fuels, support electric mobility, lower greenhouse gas emissions, and contribute to its **net-zero target of 2070**.

However, achieving these objectives will require sustained investments in renewable energy, energy storage, smart grids, and industrial decarbonisation.

Conclusion

Electrification is a cornerstone of the global energy transition and essential for achieving long-term climate goals. However, its success will depend on the parallel expansion of clean power generation, modern energy infrastructure, and technological innovation in hard-to-abate sectors.

9. 3D-Printed Artificial Reefs for Marine Ecosystem Restoration

Context

As part of efforts to strengthen marine ecosystems and support sustainable fisheries, **Tamil Nadu will introduce India's first 3D-printed artificial reef structures in the coastal waters off Ramanathapuram** under the second phase of the Pradhan Mantri Matsya Sampada Yojana (PMMSY).

About India's First 3D-Printed Artificial Reef Modules

- The initiative will function as a **pilot project** to assess six innovative reef designs created through **3D printing**.
- Each reef structure weighs about one tonne** and was developed by **Tvasta**, an IIT Madras-incubated startup, in collaboration with the **ICAR-Central Marine Fisheries Research Institute (CMFRI)**.
- The structures will be installed approximately **two nautical miles offshore** to aid marine habitat restoration.

Key Features

- The reef structures contain **complex cavities and textured surfaces** that provide shelter and attachment sites for marine organisms.

- Unlike conventional artificial reefs, they are constructed **without iron reinforcement** and use materials designed to enhance porosity and biological colonisation.
- Their enhanced surface area and structural complexity facilitate the growth of **corals, sponges, and other reef-associated organisms**.
- The technology enables **faster fabrication, lower labour requirements, and site-specific customisation**, improving the efficiency of reef restoration efforts.
- The project is expected to **enhance marine biodiversity, strengthen fish habitats, and support sustainable fisheries**.

10. Summer Air Pollution in India: Emerging Urban Air Quality Challenge

Context

The reimposition of GRAP measures during summer indicates that air pollution in India is no longer confined to winter. PM10 and ground-level ozone have emerged as major summer pollutants, posing growing environmental and public health concerns.

Key Summer Pollutants

- PM10**
 - Coarse particulate matter ($\leq 10 \mu\text{m}$).
 - Generated mainly from dust storms, construction activities, and road dust.
- Ground-Level Ozone (O_3)**
 - Secondary pollutant formed when Nitrogen Oxides (NOx) and Volatile Organic Compounds (VOCs) react in the presence of sunlight.
 - Favoured by high temperatures and intense solar radiation.

Health Implications

- Respiratory and cardiovascular ailments.
- Increased vulnerability of children, elderly persons, and outdoor workers.
- Higher healthcare expenditure and productivity losses.

Geographic Spread

Summer pollution is increasingly affecting cities beyond Delhi-NCR, including Mumbai, Chennai, Hyderabad, Bengaluru, and Kolkata.

Challenges and Way Forward

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Challenges	Way Forward
Limited focus on summer pollution compared to winter smog.	Adopt a year-round air quality management framework.
Inadequate forecasting and public warning systems.	Strengthen early-warning mechanisms and real-time advisories.
Weak monitoring and source apportionment of PM10 and ozone.	Expand monitoring networks and improve scientific assessment.
Absence of city-specific summer pollution strategies.	Develop dedicated Summer Air Quality Action Plans.
Poor enforcement of dust-control and emission norms.	Strengthen compliance and regulatory oversight.
Low public awareness regarding health risks.	Promote awareness campaigns and exposure-reduction measures.
Fragmented institutional response.	Enhance coordination among environmental, urban, transport, and health agencies.

Conclusion

The rise of PM10 and ground-level ozone reflects the evolving nature of India's air pollution challenge. Addressing it requires a year-round approach based on scientific forecasting,

11. Similipal Tiger Reserve: Biodiversity and Conservation Significance

Context

The recent sighting of **four melanistic (black) tigers** in the **Similipal Tiger Reserve** of Odisha has once again drawn attention to the reserve's unique tiger population and its significance for wildlife conservation in India.

About Similipal Tiger Reserve

- Similipal Tiger Reserve** is located in the **Mayurbhanj district of Odisha** and derives its name from the **Simul (silk cotton) tree**, which grows abundantly in the region.
- Situated in the **Deccan Peninsular Biogeographic Zone**, it represents a unique convergence of biodiversity elements from the **Eastern Ghats, Western Ghats, and Eastern Himalayas**.
- The reserve is characterised by hills, plateaus, and notable waterfalls such as **Barehipani** and **Joranda**, with **Khairiburu** and **Meghashini** (1,515 m) forming

its highest peaks.

- Its vegetation comprises predominantly **moist mixed deciduous forests**, along with patches of **tropical semi-evergreen forests, dry deciduous forests, and grasslands**.
- Sal** is the dominant tree species. The reserve harbours nearly **7% of India's flowering plant species** and about **8% of its orchid species**.
- Similipal supports rich wildlife, including **tigers, elephants, leopards, sambars, and the hill mynah**.
- The region is also inhabited by several tribal communities, including the **Santhal, Bhumija, Kolha, Bhatudi, Gond, Khadia, Mankidia, and Sahara** tribes.

12. Zojila Tunnel: Strategic Connectivity Between Kashmir and Ladakh

Context

The **Zojila Tunnel** project has crossed a major construction milestone with more than 13 km of excavation completed. Once operational, it will provide all-weather connectivity between Jammu & Kashmir and Ladakh, enhancing strategic mobility, regional integration, and economic development in the Himalayan region.

Overview

- The tunnel is being constructed between **Sonamarg in Jammu & Kashmir** and **Minamarg in Ladakh**.
- Situated at an altitude of about **11,578 feet**, it will ensure year-round connectivity across the Zojila Pass.
- At **14.15 km**, it is expected to be India's longest road tunnel and one of Asia's longest bi-directional road tunnels.
- The project is being developed at an estimated cost of **₹6,500–6,800 crore**.
- It forms part of a larger **33-km transport corridor** connecting Kashmir and Ladakh.

Key Components

- Upgradation of the Z-Morh–Zojila highway stretch.
- Construction of tunnel infrastructure, bridges, and snow galleries.
- Integration with other strategic road projects in the region to improve connectivity.

Need for the Project

- Ensuring All-Weather Connectivity**
 - The Srinagar–Leh highway passes through the Zojila Pass, which remains closed for several



months due to heavy snowfall and avalanches.

- b. Seasonal disruptions affect the movement of people, goods, and essential supplies.
 - c. The tunnel will provide uninterrupted road access throughout the year.
- 2. Strategic Necessity**
- a. Ladakh shares sensitive borders with China and Pakistan, making reliable connectivity crucial.
 - b. The project will facilitate faster movement of troops, equipment, and logistical supplies.
 - c. It will strengthen India's border infrastructure and operational preparedness.

Expected Outcomes

1. Improved Connectivity

- a. Provides seamless road connectivity between Kashmir and Ladakh.
- b. Significantly reduces travel time and improves the movement of people, goods, and services.

2. Enhanced Safety

- a. Minimises risks arising from avalanches, landslides, snow accumulation, and poor visibility.
- b. Ensures safer and more reliable travel in challenging terrain.

3. Economic Growth

- a. Promotes tourism, trade, and investment.
- b. Improves access to markets, healthcare, education, and other essential services.
- c. Generates employment opportunities and supports local livelihoods.

Challenges in Himalayan Tunnelling

1. Extreme Climatic Conditions

- a. Construction at high altitude is affected by severe cold, snowfall, and frequent avalanches.
- b. Harsh weather conditions impact both manpower and machinery.

2. Geological Complexity

- a. The Himalayas are geologically young and tectonically active.
- b. Rapid variations in rock formations make excavation difficult and unpredictable.

3. Structural Instability

- a. Fault zones, fractured rocks, cavities, and weak strata increase construction risks.
- b. Continuous monitoring is required to ensure

tunnel stability.

4. Water Ingress

- a. Groundwater and snowmelt channels can lead to sudden water inflows during excavation.
- b. Excess water can affect safety and construction progress.

Engineering and Safety Measures

New Austrian Tunnelling Method (NATM)

The tunnel is being constructed using the **New Austrian Tunnelling Method (NATM)**, which is well suited for complex geological conditions.

Key Features

1. Controlled and phased excavation.
2. Continuous monitoring of rock behaviour.
3. Immediate reinforcement using shotcrete and rock bolts.
4. Installation of drainage systems to manage groundwater.

Safety Measures

1. Dedicated ventilation and rescue shafts have been incorporated.
2. These support ventilation, emergency evacuation, rescue operations, and disaster response.
3. The project includes one of India's deepest tunnel shafts, highlighting the scale of engineering involved.

Significance of the Zojila Tunnel

1. Strategic Significance

- a. Ensures year-round access to strategically important border regions.
- b. Strengthens defence logistics and military preparedness.

2. Economic Significance

- a. Facilitates trade, tourism, and regional economic activity.
- b. Improves livelihood opportunities in remote areas.

3. Regional Development

- a. Reduces the geographical isolation of Ladakh.
- b. Enhances access to infrastructure, markets, and public services.
- c. Supports balanced development in the Himalayan region.

4. National Integration

- a. Strengthens physical connectivity between



Kashmir and Ladakh.

- b. Enhances integration of remote frontier areas with the national mainstream.

5. Infrastructure Significance

- a. Demonstrates India's capability in executing complex high-altitude infrastructure projects.
- b. Strengthens connectivity infrastructure in strategically important border regions.
- c. Showcases advanced tunnelling techniques in challenging mountainous terrain.

Conclusion

The Zojila Tunnel is a transformative infrastructure project that will provide year-round connectivity between Kashmir and Ladakh. Beyond improving transportation, it will strengthen border infrastructure, enhance strategic preparedness, promote regional development, and reinforce national integration in the Himalayan frontier.

13. Berijam Lake: A Key Freshwater Ecosystem in the Palani Hills

Context

The Madras High Court has referred a Public Interest Litigation (PIL) to its Forest Bench seeking a scientific assessment of the Berijam Lake ecosystem to determine whether the area qualifies for notification as a Tiger Reserve.

About Berijam Lake

1. **Berijam Lake** is an **artificial freshwater lake** located near **Kodaikanal** in the **Dindigul district of Tamil Nadu**, in the **Upper Palani Hills of the Western Ghats**.
2. It covers an area of **about 59 acres** and was formed in **1867** after the construction of a dam with sluice outlets under a **micro-watershed development project**.
3. The lake is situated near the historic **Fort Hamilton**, and the surrounding area served as a **British military cantonment** during the colonial period.
4. It is a major **source of drinking water** for nearby towns.
5. The lake supports rich **biodiversity**, providing habitat to species such as **gaur (Indian bison), Indian elephant, Nilgiri langur, deer, serpent eagle, rosefinch, leaf-warbler, and pale-rumped swallow**.
6. Known for its **crystal-clear waters**, Berijam Lake is an **ecologically important freshwater ecosystem** in the Upper Palani Hills.

14. Bharat Climate Observation Network: National Climate Monitoring

Context

The Bharat Climate Observation Network (BCON) recently expanded its presence in the Himalayan region through a collaboration between IITM and ARIES, Nainital, for the establishment of a dedicated climate monitoring station.

About Bharat Climate Observation Network

1. **BCON** is a national climate observation initiative developed by the **Indian Institute of Tropical Meteorology (IITM)** under the **Ministry of Earth Sciences (MoES)**.
2. It aims to establish a **long-term, high-precision climate monitoring framework** across the country.
3. The network monitors **meteorological parameters, greenhouse gases, short-lived climate forcers, atmospheric chemistry, and soil moisture**.
4. It generates reliable datasets for tracking long-term climate trends and strengthening climate change research.
5. BCON will create a national climate database to support research, climate assessments, and evidence-based policymaking.
6. The data generated by the network will aid the validation and benchmarking of **Earth System Models (ESMs)**, including IITM's **Earth System Model**.
7. BCON will support more accurate climate modelling and forecasting in India.



15. Geographical Significance of Lake Baikal

Context

A recent study of ancient human remains from the Lake Baikal region has uncovered the earliest known strains of *Yersinia pestis*, the bacterium responsible for plague.

About Lake Baikal

1. Lake Baikal is located in **southern eastern Siberia, Russia**, near the border with Mongolia.
2. It is the **oldest freshwater lake in the world**, estimated to be **20–25 million years old**, and the **largest freshwater lake by volume**.
3. It is also the **deepest lake on Earth**, reaching a



maximum depth of about **1,642 metres**.

4. Sediments beneath the lake extend nearly **7 km**, making it the world's deepest continental rift.
5. The lake contains around **45 islands and islets**, of which **Olkhon Island** is the largest.
6. About **330 rivers and streams** flow into the lake, including the **Selenga, Barguzin, Upper Angara, Sarma, and Turka** rivers, while the **Angara River** is its only outlet.
7. The **Buryat people** inhabit the eastern shores of the lake and traditionally follow Tibetan Buddhism.
8. Lake Baikal was designated a **UNESCO World Heritage Site in 1996**.

16. Aravalli Range as a Natural Barrier Against Dust Storms

Context

A recent dust storm in Rajasthan has highlighted the ecological significance of the **Aravalli Range**, which acts as a natural barrier between the **Thar Desert** and the densely populated **Indo-Gangetic Plains**. However, increasing anthropogenic pressures are weakening this protective function.

Ecological Significance of the Aravalli Range

1. The **Aravalli Range** acts as a natural barrier that restricts the movement of dust and sand from the **Thar Desert** towards the **Indo-Gangetic Plains**.
2. **Obstacle dunes** along its western slopes provide evidence of its role in trapping wind-borne sediments.
3. Vegetation cover further reduces dust transport by filtering airborne particles and slowing wind movement.

Extent and Causes of Degradation

1. A **Forest Survey of India (2018)** assessment reported the disappearance of several Aravalli hills due to anthropogenic pressures.
2. Significant degradation has been recorded in areas such as **Naraina, Kalwar, Kotputli, Jhalana, and Sariska**.
3. Major drivers of degradation include:
 - a. Mining activities;
 - b. Deforestation and loss of vegetation cover;
 - c. Urbanisation and infrastructure expansion;
 - d. Land-use changes and encroachments;
 - e. Overgrazing and unsustainable resource use.
4. The formation and expansion of gaps within the range

have weakened its capacity to intercept dust-laden winds.

Implications of Degradation

1. Increased movement of dust into the **Indo-Gangetic Plains**.
2. Deterioration of air quality, particularly in **Delhi-NCR** and adjoining regions.
3. Changes in local rainfall and microclimatic conditions.
4. Adverse impacts on agriculture, public health, and ecosystem stability.
5. Increased environmental vulnerability and reduced climate resilience in northern India.

Conclusion

The Aravalli Range is a critical ecological asset that plays a vital role in environmental security and climate regulation in northern India. Conserving and restoring the range through sustainable land-use practices, afforestation, and regulation of mining activities is essential for enhancing climate resilience and ensuring environmental sustainability.

17. Indrayani River: Course, Tributaries and Cultural Significance

Context

Recently, reports of a fish kill incident in the **Indrayani River** near **Dehu** have sparked concerns about pollution levels and the river's ecological condition.

About Indrayani River

1. A **rain-fed river of Maharashtra**, the **Indrayani** is a tributary of the **Bhima River** and part of the **Krishna basin**.
2. Rising in the **Western Ghats** near **Lonavala**, it flows eastward for about **105 km** before meeting the **Bhima** at **Tulapur**.
3. Its course lies largely north of **Pune** and traverses parts of **Pune** and **Pimpri-Chinchwad** districts.
4. The river supports **irrigation, agriculture, and local water needs**, including in the industrial belt of **Pimpri-Chinchwad**.
5. **Alandi** and **Dehu**, situated on its banks, are closely associated with Maharashtra's **Bhakti movement**.
6. **Sant Tukaram** was born in **Dehu**, while **Alandi** is revered for the **samadhi of Sant Dnyaneshwar**.
7. The **Valvan Dam** near **Kamshet** harnesses its waters for **hydroelectric power generation**.





SOCIETY AND CULTURE

1. Ambubachi Mela and the Kamakhya Temple: Centre of Tantric Shaktism in India

Context

The **Ambubachi Mela** is a major annual religious festival associated with the **Kamakhya Temple** in Assam. The event attracts devotees, saints, and practitioners of Tantric traditions from different parts of India and marks an important cultural and spiritual occasion in the region.

About Ambubachi Mela and Kamakhya Temple

1. The festival marks the belief that **Goddess Kamakhya** undergoes her annual menstrual cycle, during which the temple remains closed to devotees.
2. It is associated with **fertility, regeneration, and the onset of the monsoon**, symbolising the life-giving power of nature.
3. The term ‘**Ambubachi**’ literally means “**water flowing**.”
4. The **Kamakhya Temple** is situated on **Nilachal Hill** on the southern bank of the **Brahmaputra River**.
5. It is a prominent centre of **Tantric Shaktism** and one of the oldest **Shakti Peethas** in India.
6. The temple is built in the distinctive **Nilachala style of architecture**, which combines elements of **Nagara** and **Saracenic (Mughal)** styles.
7. It is the only temple in Assam with a fully developed ground plan.
8. The temple complex comprises five principal sections: **Garbhagriha, Antarala, Jagamohan, Bhogmandir, and Natmandir**.
9. Its architecture is characterised by domes, tiered roofs, and design elements influenced by traditional Assamese prayer halls.

2. Angkor Thom: Capital of the Khmer Empire

Context

Archaeologists have discovered remains of a 12th-century water management system and structural features within the royal palace complex of Angkor Thom, providing new insights into the engineering and urban planning of the Khmer Empire.

About Angkor Thom

1. Angkor Thom, meaning “**Great City**,” was the last and longest-lasting capital of the Khmer Empire in present-day Cambodia.
2. It is located north of Angkor Wat, between the West Baray and East Baray reservoirs.
3. The city was founded by **Jayavarman VII** after he defeated the Cham invaders and regained the Khmer capital in 1181.
4. Angkor Thom was built mainly as a **Mahayana Buddhist** city.
5. It also included elements of Hinduism and ancestor worship, reflecting the religious diversity of the Khmer Empire.
6. The city remained the centre of Khmer rule during the later period of the empire and was abandoned by the 16th century.
7. The city covers nearly **9 sq. km** and includes monuments built during different periods of the Khmer Empire.
8. Angkor Thom was planned as a square-shaped fortified city with walls about **8 metres high** and **3 kilometres long on each side**.
9. A wide moat surrounds the city and forms part of its defensive system.
10. The **Bayon Temple**, located at the centre of the city, is famous for its stone towers bearing giant carved faces.
11. Other important structures include the **Terrace of the Elephants, Terrace of the Leper King, Baphuon, and Phimeanakas**.
12. Angkor Thom is part of the **Angkor Archaeological Park**, which was designated a **UNESCO World Heritage Site** in 1992.

3. Dongria Kondh Tribe: Indigenous Guardians of the Niyamgiri Hills

Context

The Dongria Kondh, a Particularly Vulnerable Tribal Group (PVTG) inhabiting the Niyamgiri Hills of Odisha’s Rayagada and Kalahandi districts, have recently drawn attention for their distinctive cultural traditions and forest-dependent way of life.



About Dongria Kondh Tribe

1. They call themselves “**Jharnia**” (protectors of streams), while the term **Dongria** is derived from dongar, meaning *hill*.
2. The tribe traces its ancestry to **Niyam Raja**, a revered deity believed to be the creator and guardian of the Niyamgiri Hills.
3. Their social organisation is decentralised, with leadership vested in clans and villages rather than a central political or religious authority.
4. Religious ceremonies are conducted by **Beju** (male priest) and **Bejuni** (female priest).
5. They speak **Kui** and **Kuvi**, indigenous languages distinct from Odia.
6. The community is known for its distinctive jewellery, tattoos, hairstyles, and ornaments.
7. **Phakeri** is a prominent dance form associated with the tribe.
8. Their livelihood is based on **Non-Timber Forest Products (NTFPs) collection, podu (shifting) cultivation, and horticulture**, reflecting their close dependence on forest resources.

4. Halma Tradition: Community-Led Natural Resource Management

Context

The **Halma** tradition of the Bhil community was recently revived in **Borpada village of Jhabua district** in Madhya Pradesh where residents collectively restored a public well through voluntary community effort.

About Halma Tradition

1. It is based on mutual cooperation, social responsibility, and reciprocity rather than monetary compensation.
2. Under this tradition, community members voluntarily contribute their labour, tools, and resources to undertake tasks that benefit individuals or the wider community.
3. The practice functions through trust, collective responsibility, and strong community solidarity rather than formal contracts or external supervision.
4. Traditionally, Halma was used for house construction, repair of agricultural infrastructure, and management of common community resources.
5. In recent years, it has been revived for **water conservation, afforestation, soil conservation, and restoration of traditional water bodies**.
6. The tradition demonstrates the value of indigenous knowledge, collective action, and community participation in sustainable development.

5. MAHA Water Mission and Strengthening India's Water Security

Context

The Union Minister of Science & Technology recently launched the **MAHA Water Mission**, a national initiative to promote innovation-driven solutions for water security and sustainable water management.

About MAHA Water Mission

1. **MAHA Water Mission** is a national initiative to promote innovation-driven solutions for water security.
2. It brings together **academia, research institutions, industry, startups, MSMEs, and local communities** to address water-sector challenges.
3. It supports the translation of research into scalable field-level solutions.
4. Its focus areas include:
 - a. Water resource assessment and sustainable management
 - b. Drinking water
 - c. Water quality and ecological health
 - d. Water-use efficiency and circular economy
 - e. Climate resilience and adaptation
5. It has a proposed outlay of **₹200 crore over five years**, jointly funded by the **Anusandhan National Research Foundation (ANRF)** and the **Ministry of Jal Shakti**.
6. The programme will support multidisciplinary consortia involving universities, national laboratories, research organisations, startups, MSMEs, and industry partners.
7. Selected consortia can receive **up to ₹20 crore** for developing, testing, and implementing high-impact water technologies.

6. Reforming the PCPNDT Act: Balancing Gender Justice with Accessible Healthcare

Context

A recent case of delayed breast cancer diagnosis in rural Assam has revived the debate on reforming the **Pre-Conception and Pre-Natal Diagnostic Techniques (PCPNDT) Act, 1994**. While the Act has played a crucial role in preventing sex-selective practices, advances in medical technology have highlighted the need for a



regulatory framework that also supports equitable access to diagnostic healthcare.

PCPNDT Act

Background

1. The **PCPNDT Act, 1994** was enacted to prohibit **pre-conception and prenatal sex selection**, a major factor behind the declining child sex ratio in India.
2. It regulates the use of prenatal diagnostic techniques to prevent **female foeticide** and uphold **gender equality**.
3. The Act ensures that diagnostic technologies are used solely for legitimate medical purposes.

Key Provisions

1. Mandatory registration of **genetic clinics, ultrasound centres and diagnostic laboratories**.
2. Complete prohibition on communicating or disclosing the **sex of the foetus**.
3. Ultrasound equipment can be installed and operated only in **registered facilities**.
4. Manufacturers must verify purchaser credentials before supplying ultrasound machines.
5. Mandatory maintenance of prescribed records for every diagnostic procedure to ensure transparency and regulatory compliance.

Implementation Outcomes

Positive Outcomes

1. Established a robust legal framework to curb **sex-selective abortion**.
2. Strengthened regulation and accountability of prenatal diagnostic facilities.
3. Contributed to the gradual improvement in **India's sex ratio at birth**.
4. Reinforced constitutional values of **gender equality** and protection of the **girl child**.
5. Supported initiatives such as **Beti Bachao Beti Padhao** by strengthening safeguards against sex-selective practices.

Continuing Concerns

1. Illegal prenatal sex determination continues through clandestine networks despite stringent legal provisions.
2. Persistent **son preference** indicates that legal enforcement alone cannot eliminate deep-rooted gender bias.
3. Uniform restrictions on ultrasound devices have unintentionally limited their use for legitimate diagnostic healthcare.

Rationale for Reform

1. Limited Access to Diagnostic Healthcare

- a. Restrictions on portable ultrasound devices reduce access to early diagnosis of diseases such as **breast cancer**, particularly in rural and underserved areas.
- b. Shortages of specialists and diagnostic infrastructure further delay timely detection and treatment.

2. Outdated Regulatory Framework

- a. The Act applies **uniform restrictions** to all ultrasound devices irrespective of their technical capabilities.
- b. **High-frequency linear probes**, used for imaging superficial organs such as the breast, are incapable of foetal sex determination but remain subject to the same regulatory restrictions as conventional ultrasound machines.

3. Advances in Medical Technology

- a. Advances in **portable ultrasound** and **AI-assisted imaging** have enabled accurate, community-based diagnostic services with built-in safeguards against misuse.
- b. However, the existing legal framework has not kept pace with these technological developments, limiting their wider application in primary healthcare.

Reform Priorities

1. Adopt a **risk-based regulatory framework** that classifies ultrasound devices according to their potential for misuse.
2. Permit the regulated use of **high-frequency linear probes** for approved community-based diagnostic services.
3. Incorporate **AI-enabled ultrasound systems** with appropriate technical safeguards and regulatory oversight.
4. Strengthen compliance through **digital governance tools**, including geo-tagging of equipment, electronic record management and periodic audits.
5. Build the capacity of **ASHA workers, ANMs and other frontline healthcare personnel** to use approved portable diagnostic technologies under defined clinical protocols.
6. Continue strict enforcement against illegal sex determination while promoting sustained **gender sensitisation and behavioural change** through community awareness programmes.

Significance

1. Balances the objectives of **gender justice** and **equitable healthcare access**.



- Promotes early diagnosis and timely treatment, particularly in underserved regions.
- Strengthens preventive and primary healthcare through improved community-level diagnostic services.
- Encourages responsible adoption of emerging medical technologies within a robust regulatory framework.
- Supports evidence-based, technology-responsive and patient-centric healthcare governance.

Conclusion

The **PCPNDT Act** remains a cornerstone of India's efforts to eliminate sex-selective practices. However, advances in diagnostic technology and evolving public health needs call for a **technology-responsive, risk-based regulatory framework**. A balanced regulatory framework that combines technological innovation with robust safeguards can preserve the Act's core objective while ensuring timely, affordable and equitable access to diagnostic healthcare. Such reforms would align healthcare regulation with technological progress without compromising **gender justice**.

7. Masroor Rock-Cut Temples: Architecture and Cultural Significance

Context

The **Masroor Rock-Cut Temples** have come into focus for their remarkable rock-cut architecture and rich cultural heritage, making them one of the notable yet lesser-known historical monuments in India.

About Masroor Rock-Cut Temples

- The **Masroor Rock-Cut Temples** are located in the **Kangra Valley** of Himachal Pradesh near the **Beas River**.
- The temple complex dates to the **early 8th century CE** and is believed to be around **1,200 years old**.
- The complex is believed to reflect architectural features associated with the **Gupta period**.
- The temple complex is popularly known as the **"Ellora of Himachal Pradesh"** and the **"Himalayan Pyramid"**.
- The site was first documented by **Henry Shuttleworth** in 1913 and later surveyed by the **Archaeological Survey of India (ASI)** in 1915.
- No definitive reference to the temple complex has been identified in known historical texts or scriptures.

Architectural Features

- The complex consists of **15 rock-cut Hindu temples** carved from a **single monolithic rock**.
- It follows the **Nagara style** of North Indian temple architecture.

- The temples are arranged in a **symmetrical square-grid pattern**, with a central shrine surrounded by smaller shrines.
- The temple complex faces the **northeast towards the Dhauladhar Range**, unlike most Hindu temples that face east.
- The temple complex includes **shikharas**, a sacred water tank, and three entrances facing the northeast, southeast, and northwest.
- Archaeological evidence suggests that a fourth entrance was planned but never completed.

Religious Significance

- The temples are dedicated to **Lord Shiva, Lord Rama, Goddess Sita, and Lord Lakshmana**.
- They contain carvings and reliefs depicting various **Vedic and Puranic deities**.
- The friezes portray themes and narratives drawn from Hindu traditions.

Present Condition

- A significant portion of the sculptures and carvings has been damaged or lost over time.
- The damage is largely attributed to earthquakes that have affected the region over the centuries.

8. Tripura Sarinda Granted GI Tag

Context

The traditional Tripura Sarinda has been awarded the Geographical Indication (GI) tag, highlighting Tripura's rich indigenous musical heritage.

About Tripura Sarinda

- Tripura Sarinda is a traditional bowed string instrument of Tripura and is also known as **Sarinda Uakhrap**.
- The instrument is crafted from a single block of wood and contains a hollow resonating chamber.
- It incorporates bamboo components and features an oval-shaped wooden vibrating chamber covered with a thin skin membrane.
- It has a broad open upper section, a narrow waist, and an oval-shaped lower portion.
- The instrument is about **65–70 cm long**.
- Three pegs are fitted at the top for fastening and tuning the strings.
- The strings are made of metal, Muga silk thread, or animal gut.
- It is played using a bow made of horsehair.
- Other GI-tagged products of Tripura include **Tripura Queen Pineapple, Risa, Pachra (Rignai), and Matabari Peda**.





HISTORY

1. Mountbatten Plan (June 3 Plan), 1947

Context

The **Mountbatten Plan**, announced on **3 June 1947**, provided the final framework for the transfer of power from British rule in India. It led to the partition of British India into the independent dominions of **India and Pakistan** and paved the way for independence on **15 August 1947**.

Factors Leading to the Plan

1. The **Cabinet Mission Plan (1946)** failed to secure a united constitutional settlement.
2. Communal tensions intensified after **Direct Action Day (1946)** and subsequent riots in different parts of the country.
3. Political differences between the **Congress** and the **Muslim League** resulted in prolonged deadlock.
4. The British government decided to expedite the transfer of power due to worsening law and order conditions.

Key Provisions

1. British India was to be divided into **India and Pakistan**.
2. The Legislative Assemblies of **Punjab and Bengal** would decide whether their provinces should be partitioned.
3. Referendums would be held in the **North-West Frontier Province (NWFP)** and **Sylhet**.
4. The **Sindh Assembly** would decide whether Sindh would join India or Pakistan.
5. A **Boundary Commission** would be established to demarcate the borders.
6. India and Pakistan would have separate Constituent Assemblies.
7. Princely States were advised to accede to either India or Pakistan.
8. The transfer of power was advanced to **15 August 1947**.

Political Response to the Plan

1. **Indian National Congress:**
 - a. Congress accepted the plan to ensure an early transfer of power and prevent further communal violence.

- b. It preferred a strong central government to prolonged political uncertainty.
- c. It viewed partition as a lesser risk than further fragmentation of India.

2. Muslim League:

- a. The plan fulfilled its long-standing demand for Pakistan.
- b. It was seen as necessary for safeguarding Muslim political interests and aspirations.

Significance

1. Paved the way for the **Indian Independence Act, 1947**.
2. Marked the final phase of India's freedom struggle.
3. Redefined the political geography of South Asia.
4. Provided the constitutional basis for the creation of two successor dominions.

Consequences

1. Triggered one of the largest mass migrations in modern history.
2. Resulted in widespread communal violence, displacement, and loss of life.
3. Created major administrative challenges relating to borders, refugees, and the division of assets.
4. Left long-term political, social, and security challenges for both countries.

Legacy of the Mountbatten Plan

1. Formalised the partition of British India after the failure of efforts to preserve a united India.
2. Reshaped the political map of South Asia.
3. Influenced nation-building processes in both India and Pakistan.
4. Highlighted the limitations of constitutional negotiations in resolving deep communal and political divisions.
5. Continues to influence India-Pakistan relations and regional security dynamics.

Conclusion

The Mountbatten Plan represented the final constitutional framework for ending British rule in India. While it enabled a swift transfer of power and the creation of two independent states, it also led to one of the largest humanitarian crises of the twentieth century, marked by mass migration and communal violence. Its legacy continues to shape the politics and security of South Asia.



2. Dancing Girl Controversy: Historical Authenticity and Heritage Interpretation

Context

An NCERT Class 9 textbook recently featured a digitally modified image of the famous Harappan bronze figurine popularly known as the “Dancing Girl”, with its torso covered. Following criticism from historians and archaeologists, the original image was restored, reviving debates on historical authenticity, interpretation of cultural heritage, and the portrayal of historical artefacts in educational material.

About the Dancing Girl Figurine

1. The figurine belongs to the **Harappan Civilization (c. 2600–1900 BCE)** and was discovered in **1926** at **Mohenjo-daro** (present-day Pakistan).
2. It is a **10.8 cm high bronze sculpture**, currently housed in the **National Museum, New Delhi**.
3. The figure is adorned with numerous bangles and a necklace and is depicted in a distinctive posture.
4. It was crafted using the **lost-wax casting technique (cire perdue)**, demonstrating the advanced metallurgical capabilities of the Harappan Civilization.
5. The artefact is regarded as one of the finest examples of Harappan craftsmanship and provides valuable insights into the technological achievements of the Indus Valley Civilization.
6. The continued use of the lost-wax technique in parts of India reflects the enduring legacy of traditional metal-casting practices.

Origin of the Term “Dancing Girl”

1. The figurine was labelled as a “Dancing Girl” by **John Marshall**, then Director-General of the Archaeological Survey of India.
2. The identification was based largely on its posture and appearance.
3. However, no archaeological or textual evidence conclusively establishes that it represents a dancer.
4. Consequently, the designation is widely viewed as an interpretative construct rather than an evidence-based historical identification.

Colonial Influence on Interpretation

1. Early studies of Indian antiquities were often shaped by colonial-era cultural and aesthetic perspectives.
2. Victorian notions of morality influenced perceptions of nudity and artistic representation in Indian heritage.
3. Such frameworks affected the classification and interpretation of several archaeological discoveries, including the Dancing Girl figurine.

4. The episode highlights the need to critically examine colonial-era interpretations of India’s archaeological heritage.

Alternative Interpretations

1. In the absence of deciphered Harappan texts, scholars have variously interpreted the figurine as a ritual figure, a representation of female divinity, a secular individual, or even a warrior-like figure.
2. However, none of these interpretations has gained universal scholarly acceptance.

India–Pakistan Heritage Dimension

1. Following Partition, several Harappan artefacts became subjects of negotiation between India and Pakistan.
2. A subsequent agreement led to the division of excavated objects between the two countries.
3. The Dancing Girl remained in India, while the famous **Priest King** sculpture became part of Pakistan’s collection.
4. The episode highlights how archaeological heritage can become intertwined with questions of national identity and post-Partition cultural politics.

Key Issues

1. Preservation of historical authenticity in educational resources.
2. Interpretation of archaeological evidence without imposing present-day assumptions.
3. Influence of contemporary social values on the representation of the past.
4. Ensuring accurate representation of cultural heritage in textbooks and public institutions.
5. Balancing cultural sensitivity with academic integrity.

Conclusion

The Dancing Girl figurine remains a significant symbol of the artistic and technological achievements of the Harappan Civilization. The controversy surrounding its depiction underscores the importance of preserving historical authenticity and promoting evidence-based interpretations of the past, free from both colonial assumptions and contemporary value judgments.

3. Ahilyabai Holkar: Legacy of Governance, Social Reform and Cultural Patronage

Context

The birth anniversary of **Lokmata Ahilyabai Holkar** was recently observed, bringing renewed attention to her role as a distinguished ruler, administrator, and patron of

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cultural and religious institutions in the Maratha period.

About Ahilyabai Holkar

1. **Ahilyabai Holkar (1725–1795)** was the ruler of the **Malwa region** under the **Maratha Confederacy** from **1767 to 1795**. She was popularly known as “**Punyashlok**”, while historian **John Keay** referred to her as the “**Philosopher Queen**”.
2. Born in **Chondi** in present-day **Maharashtra**, she married **Khanderao Holkar** and became part of the **Holkar dynasty**.
3. Her husband was killed in the **Battle of Kumbher (1754)**. After the deaths of her father-in-law **Malhar Rao Holkar** and her son **Male Rao**, she took charge of the Holkar state in **1767**.
4. She made **Maheshwar** in present-day **Madhya Pradesh** the capital of her kingdom and appointed **Tukoji Rao Holkar** as the commander of her army.
5. Ahilyabai is best known for rebuilding the **Kashi Vishwanath Temple** and supporting the construction of temples, ghats, and rest houses at important pilgrimage centres.
6. She promoted **education and culture** by supporting scholars, poets, and the establishment of **gurukuls** and schools.
7. She encouraged the growth of the **textile industry in Maheshwar**, which later became famous for **Maheshwari sarees**.
8. She also formed a **women’s military unit**, promoting women’s participation in defence and administration.

4. Nabha Fort: Heritage Fort of the Phulkian Dynasty in Punjab

Context

A recent volunteer-led clean-up drive at the historic Nabha Fort in **Patiala district** of Punjab has renewed calls for the conservation and restoration of the monument, which is associated with Maharaja Ripudaman Singh, and its development as a heritage tourism destination.

About Nabha Fort

1. It was the **residence of the rulers** and the **administrative centre** of the former **Nabha princely state** under the **Phulkian dynasty**.
2. The fort was developed over a period of more than **150 years**, with rulers such as **Maharaja Hira Singh (1843–1911)** contributing to its expansion and beautification.
3. During the **Anglo-Sikh Wars**, the Nabha State supported the British, which helped it retain its princely status during British rule.
4. The fort includes **fortified walls, bastions, gateways, palaces, gardens, and audience halls**, reflecting both defensive and residential functions.

5. Its architecture shows a blend of **Mughal, Rajput, and Sikh styles**.
6. The interiors feature **frescoes, mirror work, coloured glass, wood carvings, decorative plasterwork, stone door frames, and stone jaalis**.
7. Important discoveries at the site include **wall paintings depicting Maharaja Ranjit Singh’s army** and the **Sard Khana**, a traditional basement cooling system.

5. Virupaksha Temple: Heritage Conservation and Architectural Legacy of Vijayanagara

Context

The Archaeological Survey of India (ASI) recently removed structures added inside the main gopuram of the Virupaksha Temple at Hampi and restored a historic mantapa that had been used as an office, as part of efforts to preserve the temple’s original architectural heritage.

About Virupaksha Temple

1. Virupaksha Temple, also known as the **Pampapathi Temple**, is dedicated to **Lord Virupaksha (Shiva)** and is located at **Hampi** on the southern bank of the **Tungabhadra River** in Karnataka.
2. It forms part of the **Group of Monuments at Hampi**, a **UNESCO World Heritage Site** since 1986.
3. The temple has remained a living place of worship since the **7th century CE**, making it one of India’s oldest continuously functioning temples.
4. Originally a small shrine, it was expanded during the **Chalukya** and **Hoysala** periods and emerged as a major religious and cultural centre under the **Vijayanagara Empire** (14th–16th centuries).
5. Vijayanagara rulers, particularly **Deva Raya II** and **Krishnadevaraya**, played a key role in its development by adding major structures, including the **eastern gopuram** and grand mandapas.

Architectural Features

1. The temple is a notable example of **Dravidian architecture**, characterised by monumental gopurams, ornate carvings, spacious courtyards, and pillared halls.
2. The complex comprises a **garbhagriha (sanctum sanctorum)**, antechambers, mandapas, and three principal gopurams.
3. The **eastern gopuram**, the tallest gateway tower, rises to about **160 feet** and consists of **nine tiers**.
4. The gopurams are adorned with sculptures depicting Hindu deities and mythological themes.
5. Its geometric patterns and structural design reflect the advanced architectural, mathematical, and engineering knowledge of the period.



- The temple also demonstrates the **pinhole camera effect**, where an inverted image of the main tower is projected onto an interior wall.

6. Birsa Munda: Tribal Resistance, Identity and Self-Governance

Context

Recent debates on tribal identity and the status of tribal converts have renewed attention on the legacy of **Birsa Munda**, one of the most influential tribal leaders of colonial India. Revered as “**Dharti Aba**” (**Father of the Earth**), he emerged as a symbol of resistance against colonial exploitation and a champion of tribal rights, cultural identity, and self-governance.

About Birsa Munda

- Birsa Munda was born on **15 November 1875** in **Ulihatu village** in present-day Khunti district of Jharkhand.
- He belonged to the Munda tribe of the Chotanagpur region.
- He is popularly remembered as “**Dharti Aba**” (**Father of the Earth**) by tribal communities.
- His father, Sugna Munda, was associated with the **Sardari movement**, which sought to protect traditional tribal land rights.
- Birsa briefly studied in missionary institutions before eventually distancing himself from missionary influence.

Colonial Transformation of Tribal Society

- Erosion of Traditional Land Rights**
 - Colonial land policies significantly altered the socio-economic structure of tribal communities in Chotanagpur.
 - The traditional **Khuntkatti system**, under which land was collectively owned by descendants of the original settlers, gradually weakened.
 - Revenue intermediaries, landlords, and moneylenders acquired greater control over tribal land and resources.
- Impact on Tribal Communities**
 - Large-scale land alienation and dispossession.
 - Rising indebtedness and economic exploitation.
 - Expansion of forced labour practices.
 - Weakening of customary institutions and village self-governance.

These developments generated widespread resentment and laid the foundation for organised tribal resistance.

Ulgulan: The Great Rebellion

Nature of the Movement

- Birsa Munda led the **Ulgulan (Great Rebellion)** during the late nineteenth century.
- It was not merely an agrarian uprising but a broader movement with political, economic, social, cultural, and religious dimensions.
- The movement opposed:
 - British colonial rule.
 - Exploitative landlordism.
 - Encroachment on tribal land and customary rights.
 - External interference in tribal social and cultural life.

Core Objectives

- Restoration of traditional land rights.
- Protection of tribal identity and customs.
- Revival of indigenous institutions.
- Assertion of community autonomy and self-governance.

Dombari Buru

- The movement reached its peak at **Dombari Buru** in present-day Khunti district.
- Thousands of followers gathered to challenge colonial authority and assert their rights.
- British forces responded with armed suppression, leading to significant casualties.
- The episode remains a defining symbol of Adivasi resistance.

Arrest and Death

- Birsa Munda was arrested in February 1900 after months of resistance against colonial authorities.
- He died in Ranchi Jail on **9 June 1900** at the age of 25.
- Although the uprising was suppressed, his ideas continued to shape tribal consciousness and political mobilisation.

Religious and Social Reform

Emergence of the Birsait Faith

- After moving away from missionary influence and interacting with different religious traditions, Birsa developed a distinct spiritual philosophy.
- His teachings emphasised:
 - Harmony with nature.
 - Moral discipline.
 - Community solidarity.
 - Social reform and self-respect.

These ideas evolved into the **Birsait faith**, which became an important medium for social mobilisation and cultural assertion.



Social Awakening

1. Encouraged unity among tribal communities.
2. Promoted cultural pride and collective identity.
3. Opposed practices that weakened community cohesion.
4. Linked spiritual reform with social and political empowerment.

Legacy and Contributions

1. Protection of Tribal Land Rights

- a. The movement brought tribal land alienation into the centre of public and administrative attention.
- b. It contributed to the enactment of the **Chotanagpur Tenancy (CNT) Act, 1908**, which restricted the transfer of tribal land to non-tribal communities and recognised traditional land rights.
- c. The Act continues to be one of the most important legal safeguards against tribal land alienation in Jharkhand.

2. Assertion of Tribal Identity

- a. Birsa strengthened the political and cultural consciousness of Adivasi communities.
- b. He emphasised dignity, self-respect, and preservation of indigenous traditions.

3. Vision of Self-Governance

- a. Birsa advocated community control over land, resources, and local institutions.
- b. His ideas reflected a broader aspiration for tribal autonomy and self-rule.
- c. This vision later influenced demands for greater political representation and regional autonomy.

4. Inspiration for the Jharkhand Movement

- a. The ideals of Ulgulan continued to inspire tribal political mobilisation throughout the twentieth century.
- b. His legacy contributed to the movement that culminated in the creation of **Jharkhand** in 2000.

Significance of Birsa Munda

1. Historical Significance

- a. Led one of the most significant tribal movements against colonial rule in India.
- b. Highlighted the contribution of tribal communities to India's anti-colonial resistance and freedom movement.

2. Tribal Rights Significance

- a. Became a powerful symbol of resistance against land alienation and economic exploitation.
- b. Continues to inspire movements for the protection of tribal rights and natural resources.

3. Socio-Cultural Significance

- a. Promoted cultural revival and social reform within tribal society.
 - b. Strengthened indigenous identity in the face of external pressures.
- ### 4. Contemporary Relevance
- a. His ideas remain relevant in discussions on tribal autonomy, forest rights, land governance, and inclusive development.
 - b. He continues to serve as a symbol of social justice, empowerment, and constitutional protection for marginalised communities.

Conclusion

Birsa Munda transformed tribal resistance into a broader movement for land rights, cultural identity, and self-governance. More than a rebel against colonial rule, he emerged as a visionary leader whose ideas continue to guide contemporary efforts towards tribal empowerment, protection of indigenous rights, and inclusive development in India.

7. Karnala Fort: Historical Legacy and Strategic Significance in the Konkan Region

Context

More than **60 hectares of forest land near Karnala Fort in Maharashtra** were recently cleared without prior **Union Government approval**, raising concerns over **illegal forest diversion**.

About Karnala Fort

1. **Karnala Fort**, also known as **Funnel Hill**, is a historic hill fort located in **Raigad district of Maharashtra** within the **Karnala Bird Sanctuary**.
2. Situated at an elevation of about **1,500 feet**, it overlooks the historic **Bor Pass**, an important route connecting the **Konkan coast** with the Deccan region.
3. Believed to have been built before **1400 CE**, the fort occupied a strategic position in northern Konkan and came under the control of several dynasties and powers over time.
4. During the **Maratha period**, it served as an important military outpost of **Chhatrapati Shivaji Maharaj**.
5. The fort comprises **upper and lower fortifications**, with the upper section featuring a **125-foot-high basalt pillar**, popularly known as **Pandu's Tower**.
6. The basalt pillar functioned as a **watchtower** and remains one of the fort's most distinctive features.
7. A **Bhavani Temple** located at the base of the fort adds to its cultural significance.





SCHEMES IN NEWS

1. Nirbhay Chetna Initiative: Advancing Gender-Responsive Governance through Panchayati Raj Institutions

Context

The Union Government has launched the **Nirbhay Chetna Initiative** to sensitise nearly **17.5 lakh elected male representatives** on issues related to **gender equality and women's safety**, with the objective of strengthening gender-responsive governance at the grassroots level.

About Nirbhay Chetna Initiative

1. It is a first-of-its-kind national programme supported through the **Nirbhaya Fund**.
2. The initiative is implemented by the **Ministry of Panchayati Raj**.
3. It seeks to promote gender-sensitive governance by strengthening awareness, accountability, and community leadership among elected representatives.
4. The programme focuses on sensitising elected male representatives to issues related to **gender equality, women's rights, safety, and security**.
5. A cadre of **28,500 Master Trainers** is being developed at the State, district, and block levels to support nationwide sensitisation efforts.
6. It encourages Panchayati Raj Institutions to foster safe, inclusive, and gender-responsive communities.

Key Components of the Nirbhay Chetna Initiative

1. **Nirbhay Chetna** promotes gender sensitivity and awareness regarding women's rights, safety, and security among elected male representatives.
2. **Nirbhay Netri** promotes leadership development, capacity-building, and legal awareness among elected women representatives.
3. **Nirbhay Drishti** envisages the installation of **CCTV cameras** at strategic rural locations to strengthen technology-enabled safety infrastructure in Panchayats.

2. Delhi-NCR Clean Mobility Scheme

Context

The Union Cabinet has approved a **two-year Clean Mobility Scheme for Delhi-NCR** to encourage the

replacement of old and polluting trucks and buses with **BS-VI or higher-emission-compliant vehicles**. The scheme is expected to benefit around **2.07 lakh commercial vehicles**, including nearly **1.91 lakh trucks** and **16,329 buses**.

Bharat Stage (BS) Emission Norms

1. **Bharat Stage (BS) norms** are emission standards prescribed by the Government of India to regulate pollutants released by motor vehicles.
2. Evolution of BS norms:
 - a. **BS-II**: 2000 (four-wheelers) and 2001 (heavy vehicles)
 - b. **BS-III**: 2005
 - c. **BS-IV**: 2010
 - d. **BS-VI**: 2020
3. India directly transitioned from **BS-IV to BS-VI**, bypassing BS-V.
4. **BS-VI** standards mandate cleaner fuels, stricter emission limits, and advanced pollution-control technologies.

Rationale for the Scheme

- a. Delhi-NCR has nearly **2.98 crore registered vehicles**, making transport a major contributor to air pollution.
- b. Older commercial vehicles contribute disproportionately to emissions of **PM2.5, NOx**, and other harmful pollutants.
- c. These emissions adversely affect air quality and pose significant public health risks.
- d. A substantial share of commercial buses and trucks in the region still operate under pre-BS-VI standards.

Impact of Legacy Vehicles on Air Quality

1. Older vehicles operate under less stringent emission norms and generate significantly higher emissions.
2. Engine deterioration over time reduces combustion efficiency and increases pollutant release.
3. Most legacy vehicles lack advanced emission-control technologies such as:
 - a. **Diesel Particulate Filters (DPF)**
 - b. **Selective Catalytic Reduction (SCR) systems**
4. Consequently, they emit substantially higher levels of particulate matter and nitrogen oxides than BS-VI-



compliant vehicles.

Key Features of the Scheme

- Encourages the replacement of ageing commercial vehicles with cleaner alternatives.
- BS-III and older vehicles** are required to be scrapped.
- BS-IV vehicles** may either be scrapped or sold outside NCR.
- Such vehicles cannot be transferred to cities covered under the **National Clean Air Programme (NCAP)**.
- Government-owned vehicles are excluded from the scheme.

Significance

- Facilitates the transition towards a cleaner commercial vehicle fleet.
- Reduces emissions of **PM2.5, NOx, and other harmful pollutants**.
- Supports improved air quality and public health outcomes in Delhi-NCR.
- Promotes the adoption of cleaner technologies and stricter emission standards.
- Complements India's broader clean mobility and environmental goals.

Related Initiatives and Institutional Framework

- National Clean Air Programme (NCAP)** aims to reduce particulate pollution in non-attainment cities.
- PM-eBus Sewa Scheme** promotes cleaner public transport through electric buses.
- The **Commission for Air Quality Management (CAQM)** coordinates air quality management measures across Delhi-NCR and adjoining areas.
- CAQM assessments indicate that a significant proportion of commercial vehicles in the region still belong to pre-BS-VI categories, highlighting the need for fleet modernisation.

Conclusion

The Clean Mobility Scheme addresses a major source of urban air pollution by accelerating the replacement of ageing commercial vehicles. Its effective implementation can strengthen clean-air efforts, improve public health outcomes, and support the transition towards sustainable urban transport.

3. Digital India BHASHINI and AI-Driven Multilingual Digital Inclusion

Context

The Digital India BHASHINI Division and Kathmandu

University have recently entered into a partnership to enhance cooperation in multilingual AI, language technology, and digital public infrastructure.

About Digital India BHASHINI Division (DIBD)

- Digital India BHASHINI Division (DIBD)** functions under the **Digital India Corporation (DIC)** of the Ministry of Electronics and Information Technology (MeitY).
- It is India's flagship initiative for enabling **multilingual access to digital services through AI and language technologies**.
- Through the **National Hub for Language Technology (NHLT)**, it provides speech and text-based AI solutions in multiple Indian languages for governance, public services, and institutional use.
- The BHASHINI platform makes **AI and Natural Language Processing (NLP)** tools accessible to startups, MSMEs, researchers, and individual innovators.
- It promotes **multilingual AI research, open-source innovation, dataset development, startup enablement, and academic collaboration**, strengthening India's digital public infrastructure ecosystem.
- The platform supports **36 Indian text languages, 23 Indian voice languages, and 35 international languages**, enabling wider linguistic accessibility.
- It powers over **800 government websites** and processes more than **15 million AI inferences daily**, facilitating seamless multilingual service delivery.
- By overcoming language barriers, BHASHINI promotes **inclusive access to digital services and strengthens citizen-centric governance**.

4. Design Linked Incentive (DLI) Scheme for Semiconductor Development

Context

Recent government remarks on the performance of the **Design Linked Incentive (DLI) Scheme** have brought focus to its role in fostering semiconductor design and enhancing domestic capabilities in the electronics sector.

About the Design Linked Incentive (DLI) Scheme

- The **Design Linked Incentive (DLI) Scheme** is implemented by the **Ministry of Electronics and Information Technology (MeitY)** under the **Semicon India Programme** to strengthen India's **fabless semiconductor ecosystem**.
- The scheme seeks to reduce import dependence, improve supply-chain resilience, and enhance domestic value addition by supporting semiconductor design and deployment.



3. It covers the entire semiconductor design lifecycle, including **Integrated Circuits (ICs), chipsets, Systems-on-Chip (SoCs), systems, IP cores, and other semiconductor-linked designs.**
4. **C-DAC (Centre for Development of Advanced Computing)** is the nodal agency for its implementation.
5. **Start-ups and MSMEs** are eligible for financial incentives and design infrastructure support, while other domestic companies can avail deployment-related incentives.

Incentives under the Scheme

1. **Product Design Linked Incentive:** Reimbursement of up to **50% of eligible expenditure**, subject to a maximum of **₹15 crore per application.**
2. **Deployment Linked Incentive:** Incentives ranging from **6% to 4% of net sales turnover for five years**, subject to a ceiling of **₹30 crore per application.**
3. The minimum cumulative net sales requirement over five years is **₹1 crore for start-ups and MSMEs** and **₹5 crore for other domestic companies.**

5. Jal Sanchay Jan Bhagidari Initiative: Participatory Water Conservation and Groundwater Recharge

Context

Karnataka's **Bidar district** was recently recognised among the best-performing districts under the **Jal Shakti Abhiyan: Catch the Rain** campaign and received the **Jal Sanchay Jan Bhagidari Award** for its efforts in water conservation and groundwater recharge.

About Jal Sanchay Jan Bhagidari Initiative

1. The **Jal Sanchay Jan Bhagidari Initiative** was launched in **2024** under the **Ministry of Jal Shakti.**
2. It aims to strengthen **water conservation** and **groundwater recharge** through active public participation.
3. The initiative follows a **whole-of-government and whole-of-society approach** to ensure efficient conservation of water resources.
4. It encourages the participation of **government agencies, local communities, industries, NGOs, and resident welfare associations** in water conservation efforts.
5. Key activities under the initiative include **rainwater harvesting, aquifer recharge, borewell recharge, and recharge shafts.**
6. These measures help capture and store rainwater and surface runoff, thereby improving **groundwater availability.**
7. The initiative promotes **community-led management of local water resources** and encourages responsible water use.

8. It enhances **climate resilience** by increasing water storage capacity and helping communities cope with droughts and extreme rainfall events.
9. The recharge process also improves **water quality** by naturally filtering water through soil and reducing salinity and contamination.

6. e-Jagruti Platform and Digital Transformation of Consumer Dispute Redressal in India

Context

The e-Jagruti platform was recently honoured with the Silver Award at the National Awards for e-Governance (NAeG) 2026 for strengthening technology-driven consumer dispute resolution in India.

About e-Jagruti Platform

1. **e-Jagruti** is a flagship digital initiative of the **Department of Consumer Affairs**, launched on **1 January 2025** to establish a technology-driven and integrated consumer dispute redressal system.
2. It integrates **e-Daakhil, Online Case Monitoring System (OCMS), NCDRC CMS, and CONFONET** into a unified AI-enabled and paperless platform.
3. The platform enables consumers to **file complaints, make online payments, track case progress, and access orders and judgments** through a single digital interface.
4. It provides secure access through **end-to-end encryption and role-based permissions**, allowing users, including **NRIs**, to manage cases from any location.
5. To ensure inclusivity, the platform offers **multilingual support and accessibility features**, making consumer grievance redressal more user-friendly and widely accessible.
6. It uses **Artificial Intelligence (AI) and Machine Learning (ML)** tools for smart search of archived complaints, cases, and judgments, along with voice-to-text conversion of judicial records.
7. The platform streamlines the functioning of consumer commissions by improving case management, reducing procedural delays, and minimising reliance on physical processes.
8. By digitising consumer dispute resolution, it enhances **transparency, efficiency, and accessibility** across the consumer protection ecosystem.
9. It facilitates **timely, transparent, and cost-effective resolution** of consumer disputes at the district, state, and national levels.





ETHICS

1. Freedom of Expression and Ethical Responsibility in Public Discourse

Context

A recent public controversy has revived debate on the ethical limits of free expression and the responsibilities associated with public influence. The episode highlights the challenge of balancing individual liberty with social responsibility in an era of rapid and widespread communication.

Ethical Issues Involved

1. Balancing **freedom of expression** with **social responsibility**.
2. Protecting **human dignity**, equality, and individual autonomy.
3. Promoting gender-sensitive and inclusive communication.
4. Accountability for the social impact of public statements.
5. Preventing the normalisation of stereotypes and discriminatory attitudes.
6. Upholding ethical standards in media, entertainment, and digital platforms.

Stakeholders

1. Women and vulnerable groups.
2. Public personalities, artists, and content creators.
3. Audience members and citizens.
4. Social media platforms and digital communities.
5. Educational institutions and civil society organisations.
6. Regulatory and governance bodies.

Ethical Dimensions

1. **Human Dignity:** Respect for the intrinsic worth of every individual.
2. **Empathy and Compassion:** Sensitivity towards the experiences and concerns of others.
3. **Accountability:** Responsibility for the consequences of one's actions and expressions.
4. **Emotional Intelligence:** Awareness of the social and emotional impact of communication.
5. **Integrity:** Consistency between values, speech, and conduct.
6. **Responsible Freedom:** Exercise of rights with due

regard for the rights of others.

7. **Objectivity and Non-Discrimination:** Avoiding bias, prejudice, and unfair generalisations.
8. **Constitutional Morality:** Adherence to the values of justice, liberty, equality, fraternity, and dignity.
9. **Tolerance and Respect for Diversity:** Acceptance of differing identities, beliefs, and viewpoints.

Values in Conflict

Value	Counter Value
Freedom of Expression	Social Responsibility
Creative Liberty	Human Dignity
Individual Autonomy	Public Accountability
Personal Freedom	Collective Welfare
Entertainment	Ethical Sensitivity

Ethical Perspective

1. Freedom of expression is fundamental to democracy and the free exchange of ideas.
2. However, every right carries corresponding duties; liberty must not undermine the dignity and rights of others.
3. Individuals with significant public influence have greater ethical responsibility because their words can shape social attitudes and behaviour.
4. Humour and artistic expression can encourage dialogue and reflection, but should not legitimise prejudice, discrimination, or disrespect.
5. The issue highlights the distinction between **legality and morality**; conduct may be lawful yet ethically questionable.
6. Ethics demands not only respect for rights but also sensitivity towards the consequences of one's actions on society.
7. Ethical communication should promote trust, inclusiveness, mutual respect, and social harmony.
8. A democratic society must balance freedom with responsibility through self-regulation, ethical awareness, and civic maturity.

Lessons for Public Life and Governance

1. Influence must be accompanied by accountability.
2. Human dignity should remain the foundation of public discourse.
3. Ethical leadership requires challenging prejudice and



promoting inclusion.

4. Gender-sensitive communication strengthens social equality.
5. Ethical public discourse enhances democratic culture, social trust, and informed citizenship.
6. Responsible exercise of freedom is essential for both individual liberty and collective well-being.

Way Forward

1. Promote value-based education centred on dignity, equality, empathy, and respect.
2. Encourage ethical standards and self-regulation in media and entertainment.
3. Strengthen digital and media literacy for responsible communication.
4. Increase awareness regarding consent, gender sensitivity, and respectful public engagement.

5. Encourage public figures to use their influence to advance positive social values.
6. Foster dialogue-based conflict resolution and discourage polarisation.
7. Strengthen constitutional values, civic responsibility, and ethical citizenship.

Conclusion

Freedom of expression is a cornerstone of democracy, but its true strength lies in its ethical exercise. Public discourse should uphold constitutional values by promoting dignity, respect, and inclusiveness while remaining mindful of its wider social impact. A balanced approach that harmonises individual liberty with social responsibility strengthens democratic culture, responsible citizenship, and the common good.





PLACES IN NEWS

Place	Context	Key Highlights
1. Switzerland	Switzerland recently hosted high-level U.S.-Iran talks, underscoring its enduring role as a trusted venue for international negotiations and diplomatic dialogue.	1. Switzerland is a landlocked country located in Western and Central Europe, with Bern as its capital. 2. It is bordered by Germany to the north, France to the west, Italy to the south, and Austria and Liechtenstein to the east. 3. Switzerland is not a member of the European Union (EU) or the North Atlantic Treaty Organization (NATO). 4. The country's physical landscape is dominated by the Alps in the south and the Jura Mountains in the north. 5. Monte Rosa, located in the Pennine Alps, is the highest peak in the country. 6. Important lakes include Lake Geneva (shared with France) and Lake Neuchatel, the largest lake entirely within Switzerland. 7. The country experiences climatic influences from Atlantic, Arctic, continental European, and Mediterranean air masses, resulting in varied weather conditions.
2. Lebanon	Lebanon recently came into focus after escalating hostilities between Israel and Hezbollah led to the suspension of diplomatic talks between the United States of America and Iran.	1. Lebanon is a country in West Asia situated along the eastern coast of the Mediterranean Sea, with Beirut as its capital city. 2. It shares borders with Syria to the north and east, Israel to the south, and the Mediterranean Sea to the west. 3. The country experiences a Mediterranean climate, characterised by mild, wet winters and hot, dry summers. 4. Major physical features include the Lebanon Mountains (Jabal Lubnan), the Hermon Range, and the fertile Bekaa Valley (Al-Biq). 5. Qurnat as Sawda' (3,087 m) is the highest peak in Lebanon. 6. The Litani River, the country's most important river, irrigates the agriculturally significant Bekaa Valley. 7. Important natural resources include limestone, gypsum, oil, natural gas, and salt.
3. Jordan	Jordan has gained attention amid escalating tensions in West Asia following reports of Iranian missile strikes targeting a U.S. military airbase in the country.	1. Jordan is a country in West Asia, located in the northern Arabian Peninsula, with Amman as its capital and largest city. 2. It shares borders with Syria (north), Iraq (east), Saudi Arabia (south and southeast), and Israel and the West Bank (west). 3. The country is predominantly an arid desert plateau, with a major north-south geological rift along its western edge. 4. Jabal Umm ad Dami is Jordan's highest peak. 5. The Jordan River, the country's principal river, flows into the Dead Sea, which forms part of its western border. 6. Other important water bodies include the Gulf of Aqaba and the Sea of Galilee. 7. Aqaba, on the Gulf of Aqaba, is Jordan's only seaport. 8. Jordan's major natural resources include phosphates, potash, and shale oil.



4. Albania	Large-scale protests in Albania against a proposed luxury tourism project along its Adriatic coast have brought the country into focus, highlighting its geographical location and strategic significance in the Balkan region.	1. Albania is a country in Southeastern Europe on the Balkan Peninsula, with Tirana as its capital. 2. It shares land borders with Montenegro (northwest), Kosovo (northeast), North Macedonia (east), and Greece (south and southeast). 3. It is bounded by the Adriatic Sea to the west and the Ionian Sea to the southwest. The Strait of Otranto separates Albania from Italy and connects these two seas. 4. The country is predominantly mountainous, with the Albanian Alps, Korab Mountains, and Pindus Mountains as its major mountain ranges. Mount Korab is the highest peak. 5. The western coastal region experiences a Mediterranean climate, while the interior and eastern regions have a continental climate. 6. Major rivers include the Drin and Vjosa. Important lakes include Lake Shkodër (shared with Montenegro) and Lakes Ohrid and Pre-spa (shared with North Macedonia). 7. Albania possesses reserves of petroleum, natural gas, coal, and metallic minerals, particularly chromite. 8. Its strategic location along the Adriatic–Ionian maritime corridor enhances its geopolitical, economic, and maritime significance in the Balkan region.
5. Armenia	Recently, Armenia's ruling Civil Contract Party won the parliamentary elections, securing another term in power under Prime Minister Nikol Pashinyan.	1. Armenia is a landlocked country in the South Caucasus, with Yerevan as its capital. 2. It borders Georgia (north), Azerbaijan (east), Iran (southeast), and Turkey (west). 3. The country has a highland continental climate, characterised by warm summers and cold winters. 4. The Lesser Caucasus Mountains dominate its rugged terrain, with Mount Aragats (4,090 m), an extinct volcano, as the highest peak. 5. Major rivers—the Aras, Hrazdan, Arpa, and Vorotan—support irrigation and hydropower. 6. Lake Sevan is Armenia's largest lake and its principal freshwater resource. 7. Armenia is endowed with gold, copper, molybdenum, zinc, and bauxite, while its volcanic soils are rich in nitrogen, potash, and phosphates.
6. Bolivia	The President of Bolivia has declared a state of emergency in response to the prevailing situation in the country, bringing renewed attention to the political and socio-economic developments in this South American nation.	1. Bolivia is a landlocked country in central-western South America. 2. It borders Brazil, Paraguay, Argentina, Chile, and Peru. 3. Sucre is the constitutional capital, while La Paz is the administrative and executive capital. 4. The country is characterised by the Andes Mountains, the Altiplano Plateau, intermontane valleys, and vast eastern lowlands. 5. The Andes in western Bolivia comprise the Cordillera Occidental and Cordillera Oriental, with Nevado Sajama (6,542 m) as the highest peak. 6. Major rivers include the Beni, Desaguadero, Guapore, Madre de Dios, and Mamore. 7. Lake Titicaca, shared with Peru, is South America's largest freshwater lake and the world's highest navigable lake. 8. Bolivia is endowed with abundant natural gas, tin, silver, zinc, and lithium, making it one of the world's most significant holders of lithium resources for the clean energy transition.





ESSAY

1. Thought Finds a World and Creates One Also

Every civilization is born twice—first in thought and then in reality. Every scientific discovery, social reform, institution, and technological innovation begins as an idea before transforming the world. Unlike other living beings, human beings possess the unique ability not merely to adapt to their surroundings but also to understand them, question them, and reshape them. The statement, **“Thought finds a world and creates one also,”** captures this remarkable dual role of human intellect. Thought first discovers the truths embedded in nature, society, and human consciousness; it then transforms these discoveries into new possibilities through imagination, innovation, and collective action. Human progress, therefore, is a continuous journey from understanding the world as it is to creating the world as it ought to be.

The first responsibility of thought is to discover the world. Nature functions according to immutable laws, but these laws become meaningful only when the human mind uncovers them. Isaac Newton did not create gravity; he revealed a principle that had always governed the universe. Likewise, Charles Darwin explained the process of evolution, while Galileo replaced unquestioned belief with scientific inquiry. These discoveries transformed humanity’s understanding of reality and laid the foundation for modern civilization. Thought, therefore, first finds the hidden order of the world before attempting to transform it.

Discovery alone, however, does not define the power of thought. Its true significance lies in converting knowledge into innovation that enhances human welfare. Newton’s discoveries eventually enabled satellites, navigation systems, and space exploration, while Marie Curie’s work on radioactivity revolutionized medicine. In India, the Green Revolution transformed scientific research into food security for millions. Similarly, India’s digital revolution, led by innovations such as the Unified Payments Interface (UPI), has redefined financial inclusion. Science thus demonstrates the complete journey of thought—from discovering reality to creating a better one.

History offers equally compelling evidence that ideas shape civilizations. Powerful empires have risen not merely through military strength but through enduring intellectual traditions. Chanakya’s principles of governance laid the foundation of the Mauryan Empire and continue to influence strategic thought. Rabindranath Tagore challenged the rigid colonial education system by establishing Visva-Bharati, where learning transcended geographical and cultural boundaries. The ideals of liberty, equality, and fraternity inspired the French Revolution and permanently transformed democratic politics. History reminds us that while force may establish kingdoms, only ideas build civilizations.

Human thought also transforms the limitations imposed by geography. Mountains, deserts, and oceans may appear as obstacles, yet they become opportunities through human ingenuity. The Incas developed terrace farming in mountainous terrain, while communities in Rajasthan mastered rainwater harvesting despite arid conditions. The living root bridges of Meghalaya symbolize the harmonious integration of indigenous wisdom and nature. Ancient Indian sailors used their understanding of monsoon winds to transform the Indian Ocean into one of the world’s greatest maritime trade routes. Geography determines circumstances, but thought determines possibilities.

The greatest creations of thought are often moral rather than material. Every social reform begins when individuals question injustice and imagine a more humane society. The Buddha transformed Angulimala not through force but through compassion, illustrating the power of ethical thought to reform even the most hardened minds. Mahatma Gandhi transformed personal suffering into the philosophy of Satyagraha, proving that moral conviction could challenge an empire. The abolition of untouchability, movements for women’s empowerment, and the growing recognition of LGBTQ+ rights all demonstrate that social progress originates in changing ideas before changing institutions. Lasting reforms are born not merely from legislation but from enlightened consciousness.

Thought also finds expression in democratic governance. Institutions become stronger when societies critically examine their shortcomings and reform themselves. The Right to Information Act strengthened transparency by empowering citizens with information. Social audits under MGNREGA institutionalized public participation in governance, while T. N. Seshan’s electoral reforms reinforced the integrity of India’s democratic process. Similarly, the Supreme Court’s evolving interpretation of constitutional values has expanded the meaning of liberty, dignity, and equality. Good governance, therefore, is the institutionalization of thoughtful reflection and ethical action.



Economic development, too, is fundamentally driven by ideas rather than resources alone. The Green Revolution demonstrated how scientific innovation could overcome chronic food shortages. The Goods and Services Tax integrated fragmented markets into a unified economic framework, while UPI revolutionized digital payments by making financial transactions simple and inclusive. At the global level, the Great Depression inspired Keynesian economics, fundamentally redefining the role of the State in managing economic crises. Amartya Sen's Capability Approach further expanded the understanding of development by emphasizing human freedom rather than income alone. Prosperity ultimately reflects the quality of ideas that guide economic institutions.

In an increasingly interconnected world, thought transcends national boundaries and inspires collective action. The European Union emerged from the realization that cooperation provides a stronger foundation for peace than conflict. Scientific evidence on ozone depletion led to the Montreal Protocol, while growing awareness of climate change inspired the Paris Agreement and the International Solar Alliance. India's Vaccine Maitri initiative demonstrated how humanitarian values could strengthen international partnerships. Such initiatives show that humanity's greatest achievements arise when knowledge is guided by shared responsibility.

However, thought is not inherently virtuous. Every act of creation carries ethical responsibility. Ideas can liberate societies, but they can also become instruments of oppression. Nazi racial ideology transformed prejudice into unprecedented human suffering. Industrialization, despite improving living standards, also contributed to climate change and ecological degradation. Karl Marx argued that material conditions often shape ideas, reminding us that thought does not exist in isolation from social realities. Even Dr. B. R. Ambedkar's constitutional vision of equality remains an unfinished project, demonstrating that noble ideas require sustained institutions and collective commitment for their realization. Thought, therefore, must always be guided by ethics, compassion, and wisdom.

Ultimately, the history of civilization is the history of ideas becoming reality. Every enduring achievement—whether democracy, constitutionalism, scientific discovery, digital innovation, or space exploration—began as a thought before transforming the world. Yet the true greatness of thought lies not merely in discovering new knowledge or creating new technologies, but in advancing justice, sustainability, and human dignity. Civilizations are remembered not for the monuments they inherit but for the ideas they create. When knowledge is combined with imagination, ethics, and collective action, thought not only finds the world but also creates a better one. In this profound sense, the progress of humanity is, and will always remain, the triumph of thought over limitation and possibility over circumstance.

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